An ENVIRONMENTAL IMPACT ASSESSMENT report

For

CONSTRUCTION OF PAPER MANUFACTURING UNIT BY M/S G & Z PAPER (PVT) LTD

LOCATED AT

Plot No 147, SUNDAR INDUSTRIAL ESTATE, LAHORE.

PROJECT PROPONENT:

MR. ALI ANWAR

PREPARED BY

Green Yasin Environment Consultants

PEC Certified

209 – C Faisal Town, Lahore

0092 300 0286296

Submitted to:

Environment Protection Agency, Punjab

LIST OF ABBREVIATIONS

CO_2	Carbon dioxide
dB(A)	A weighted decibel scale
EIA	Environmental Impact Assessment
EMMP	Environmental Management and Monitoring Plan
EMP	Environmental Management Plan
EPA	Environmental Protection Agency
EPD	Environmental Protection Department
EPO	Environmental Protection Ordinance
IEE	Initial Environmental Examination
Ltd.	Limited
LTI	Loss Time Injury
LWI	Loss Work Injury
m^3	Cubic meter
m^3/h	Cubic meter per hour
MW	Megawatt
M/S	Messrs
NEQS	National Environmental Quality Standards
No.	Number
NOC	No Objection Certificate
NO_x	Oxides of Nitrogen
PEPC	Pakistan Environmental Protection Council

PEPA, 1997	Pakistan Environmental Protection Act, 1997
PEPA, 2012	Punjab Environmental Protection (Amendment) Act, 2012
PEPO	Pakistan Environmental Protection Ordinance
PKR	Pakistani Rupees
PM	Particulate Matter
PPEs	Personal Protective Equipment
Pvt.	Private
SMART	Self-Monitoring and Reporting
SOPs	Standard Operating Procedures
SO_x	Oxides of Sulfur
WAPDA	Water and Power Development Authority

EXECUTIVE SUMMARY

INTRODUCTION

Said project is the Construction of paper manufacturing unit by M/s G & Z Paper (Pvt) Ltd at Plot No 147, Sundar Industrial Estate, Lahore. The modem manufacture of paper evolved from an ancient art first developed in China, ca. 105 A.D. Although the modem product differs considerably from its ancestral materials, papermaking retains distinct similarities to the processes developed by Ts'ai Lun in the Imperial Chinese Court. ' In principle, paper is made by: pulping, to separate and clean the fibers; beating and refining the fibers; diluting. to form a thin fiber slurry, suspended in solution; forming a web of fibers on a thin screen; pressing the web to increase the density of the material; drying to remove the remaining moisture; and finishing, to provide a suitable surface for the intended end use. There are various technologies that are being used for paper manufacturing as shown in the table below:

Pulp grades use	Wood type	End-product use
Chemical pulps:		
sulfite pulp	Softwoods and hardwoods	Fine and printing papers
Kraft sulfate pulp	Softwoods and hardwoods	Bleached-printing and writing papers, paperboard Unbleached-heavy packaging papers, paperboard.
Dissolving pulp	Softwood s and hardwoods	Viscose rayon, cellophane, acetate fibers, and film
Semichemical pulps:		
Cold-caustic process	Softwoods and hardwoods	Newsprint and groundwood printing papers
Neutral sulfite process	Hardwoods	Newsprint and groundwood printing papers
Mechanical pulps		
Stone groundwood ,	Softwoods	Corrugating medium
Refiner mechanical (RMP)	Softwoods	Newsprint and groundwood printing papers
Thermomechanical (TMP)	Softwooods	Newsprint and groundwood printing papers

SOURCE: Modified from George H. Soyd III and Chad E. Brown, *Paper Industry: Outlook for Market Pulp* (New York, NY: Kidder, Peabody & Co., 19S1), p. 5.

Figure 1 Different paper manufacturing technologies

To full fill the compliance of section 12 of PEPA, Act 1997 (amended 2012 & 2017) M/s **Green Yasin Environment Consultants** has been engaged for conducting Environmental Impact Assessment (EIA) of said industry.

The main objectives of this EIA are to establish baseline environmental conditions, identify potential impacts and suggest suitable mitigation measures for the execution of the said project. This study has been accomplished in line with the provisions – guidelines and directives of Punjab Environmental Protection Agency.

PROJECT OUTLINE (Details are given in Chapter 2)

Salient features of project:

Name:	**Mr. Ali Anwar**
Project Title:	Construction of papers manufacturing unit by M/s G & Z Paper (Pvt) Ltd
Project Location:	Plot No 147 Sundar Industrial Estate, Lahore
Project Coordinates	31°17'19.3"N 74°10'37.1"E
Total Area	2.71 Acre/21.68 Kanal 118056.88 Sq.ft
Final Product	Decorative Printed Papers
Raw Material	• Wood pulp (65%) • Fillers (30%) • Pigments (5%), • wet strength agent (5%), • sodium sulfate (3%) • caustic (2%)
Final Capacity	40 tons/day
Type of Process	Physical Process
Source of Power:	Main Source WAPDA
Source of Wastewater	Only Domestic Type
Disposal	SIE – Sewerage Lines

MAJOR IMPACTS AND RECOMMENDED MITIGATION MEASURES:

Beneficial/Positive Impacts:

- The establishment of the said project will contribute to enhancing Pakistan's domestic productivity, and help diversify Pakistan's economy
- Provision of employment and stimulation of local economy.
- Provision of high-quality packaging paper.

Negative Impacts:

Impacts	**Mitigation measures**
Construction phase	

Dust emissions	Vehicular movement will generate most of the dusts. Dusts will be suppressed using water bowser to spray exposed land surfaces and particularly areas likely to be disturbed by trucks and other vehicles during the construction of the factory premises. Vehicular speed limits of 20 km/h will be ensured in order to minimize dust generation. Further mitigation measures will be: • Covering haulage vehicles transporting aggregate, soil and cement • Covering onsite stockpiles of aggregate, cement, soil, etc. • Providing workers with the necessary Personal Protective Equipment (PPE) e.g. dust mask and ensure that they are worn
Impacts of accidental spillages	• The integrity of storage facilities will be ensured • Drip pans will be made available where necessary
Safety	• Safety signage will be put in relevant places within the construction site • Reckless driving by construction workers will be prohibited and monitored. • Workers will be given PPEs such as; helmets, mask, ear-plugs/muffs, safety boots, safety goggles, safety jackets, harnesses etc. and its use was strictly enforced • Workers will be trained on regular basis regarding personal safety • Incidents will be reported directly to the concerned authority
Solid waste management	• Recycling or reuse of waste wherever possible.

	• Application of a good strategy to collect, remove and safely dispose of waste on daily basis to ensure a clean environment in the factory site • At the end of the construction phase, left-over waste will be removed as per practices of area • Scrap and the debris will be removed from the site at the end of the construction stage after appropriate segregation of the material
Operation Phase	
Air Emissions, Particulate emissions and stack emissions	• The inspection and the maintenance of the generator will be done on regular basis when in use. • Plantation of indigenous trees within the premises and along the boundary • Boiler will be equipped with air emission control technology
Noise Emissions	• Effective noise suppression design and plan will be made for all noise producing equipment i.e. high noise generating machines will be kept in isolation from other machines to minimize the overall cumulative noise. • Noise barriers should be implanted • PPEs will be provided to workers • Proper tree plantation will be done • Noise monitoring will be carried out periodically.
Degradation of surface waters quality due to process water and sewage direct disposal	• Overall process is dry so domestic wastewater will be treated primarily before disposal. • It will be ensured that the process remains dry and no chemical is mixed in wastewater causing damage to surface water.

	• Wastewater will be disposed off in sewerage lines of Sundar Industrial Estate. Allotment letter has been attached.
To minimize loss work injury/hazards/incidents/accidents	• Proper training will be provided for the proper usage of machineries and personal protective equipment (PPE) will be provided. • Emergency response plans will be remained active. • Implementation of work rotations, provision of regular work breaks. • At workplace, first aid facilities will be maintained at readily accessible places.
To minimize disturbance of communities due to noise	• All the machinery will be installed and operated in a closed hall and from operation of machinery noise will not be a problem for the residents in the area nearby. Further Administration of the unit will take the precautionary measures to avoid the noise emissions. There is no possibility of Noise pollution • A thick greenbelt will be developed all around the plant which will be acting as noise barrier. • All the workers will be provided with ear plugs. • All the transporters will be advised to carry out regular maintenance of their vehicles.
Solid waste management	• There will be separated bins for segregation of different type of waste • Proper waste collection system will be ensured. For this purpose, waste bins will be placed inside the boundary. • The recyclable waste will be sent to waste contractors. • Records of generated waste should be maintained.

	• Training will be provided to personnel for identification, segregation and management of waste. • All containers of waste will be labeled properly.
Traffic	• Nighttime driving of project vehicles will be limited where possible. • The route of the vehicles will be defined and given to drivers and security system. • Speed limits will be maintained. • All vehicle drivers will be trained in community safety aspects. Drivers will be trained in responsible and safe driving practices; safe speed limits for vehicles will be followed.

ENVIRONMENTAL MANAGEMENT & MONITORING PLANS:

During construction, ambient air quality for dust level in particular noise level (tests), solid waste management and soil contamination, and community and workers' safety (visual) need to be monitored. During operation, stack emissions, noise level, air quality, wastewater quality and workers' safety will be monitored. Plan has been included in **Chapter-7** of this EIA Report.

CONCLUSION & RECOMMENDATION

It can be concluded that all the major and minor adverse environmental impacts from the Construction of paper manufacturing unit by M/s G & Z Paper (Pvt) Ltd has been mitigated in environmentally friendly manner and the Environmental Impact Assessment is being done in the light of guidelines recommended by Punjab EPA. Hence, Environmental Approval may be accorded to the subject industry for construction phase.

Recommendations:

Following Recommendations are suggested:

- All the workers should be given with proper PPE's during operation phase
- All the concerns of stakeholders should be catered before construction
- EMP should be properly implemented
- The construction and installation should be completed in guidelines of accorded Environmental Approval.

LIST OF ANNEXURE

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CHAPTER NO 1
INTRODUCTION

CHAPTER 1: INTRODUCTION

1.1 GENERAL

Said project is the Construction of Paper Manufacturing Unit by M/s G & Z Paper (Pvt) Ltd. As per PEPA 2017 and the IEE/EIA Regulations, 2022 it is mandatory for the proponent of any development project to obtain Environmental Approval from EPA Punjab by filing an IEE or EIA as the case may be, before the Agency. This Report presents the Environmental Impact Assessment for aforesaid unit. For this purpose, the proponent has engaged environmental consultants, **M/s Green Yasin Environment Consultants.** The report provides relevant information, as required under the officially approved format, to facilitate the decision makers i.e. EPA Punjab for the issuance of Environmental Approval.

1.2 THE PROPONENT

Table 1-1 Details of Project proponent

Name	Mr. Ali Anwar
Address	House No 2/4, Muhallah Shabbir Road, Lahore Cantt, District Lahore
Contact person	Mr. Muhammad Awais
Contact Number	0300-0286296

1.3 THE PROJECT

1.3.1 Nature of Project

The said project is the Construction of paper manufacturing unit by M/s G & Z Paper (Pvt) Ltd. Its salient features have been described later in this Chapter, Chapter 3 and briefly in Executive Summary of this EIA Report.

1.3.2 Location of Project

Said Project is located at Plot No 147, Sundar Industrial Estate, Lahore. The GPS coordinates of site are 31°17'19.3"N 74°10'37.1"E.

Figure 2 Location of Project Site

1.3.3 Total area

Total area required for said project is approx. 2.71 Acre/21.68 Kanal (118056.88 Sq.ft).

1.3.4 Cost of the Project

Cost of project has been estimated at Approx. PKR 180 million.

1.4 DETAILS OF CONSULTANTS

For the preparation of the Environmental Impact Assessment report of the said project, the proponent has hired the services of the environmental consultants; **M/S Green Yasin Environment Consultants.** Team comprising of environmental engineers, chemical engineers,

environmental experts and environmentalists has worked on this report. Team comprising of environmental engineers, chemical engineers, environmental experts and environmentalists has worked on this report.

Environmental Compliance Studies

- Initial Environmental Examination
- Environmental Impact Assessment
- Socio-Environmental Impact Assessment
- Green House Gas Estimation
- Environmental Management Plan

Contact Details:

Name	Mian Muhammad Awais on behalf of Green Yasin Environment Consultants
Address	209 – C Faisal Town, Lahore
Contact No.	0092 300 0286296

1.4.1 Team Members

Qualified professionals with relevant experiences of conducting environmental assessment have contributed to the preparation of Environmental Management Plan. The team has been shown in Table-1.

Table 2: Team of Experts

Sr. #	Name	Qualification	Roles
Environmental Scientist			
i.	Mian Awais	BS (Hons) Environmental Science	Project Head
ii.	Dr. Afzal Hussain	PhD Environmental Science	Social Survey
iii.	Ms. Usba	M.phil Environmental Science	Report Writing

iv.	Ms. Kiran	BS (Hons) Environmental Science	Environmental Monitoring
v.	Mr. Shahzad	BS. Hons Environmental Science	Environmental Monitoring

1.5 PURPOSE OF 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 development and 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 Environmental Impact Assessment (EIA) 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. The main objectives of this EIA study were:

- 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.
- Prepare an EIA Report for submittal to the Environmental Protection Agency, Punjab for according Environmental Approval.

1.6 Structure of Report

This EIA reviews information on existing environmental attributes of the Study Area. Geological, hydrological and ecological features, air quality, noise, water quality, soils, social and economic aspects and cultural resources are included. The report predicts the probable impacts on the environment due to the proposed 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;

- Description of the Project
- Alternatives
- Scoping & Screening
- Description of Environmental and Social Conditions
- Assessment of Environmental Impacts and Mitigation Measures
- Mitigation Measures for Identified Impacts
- Public Consultation
- Environmental Management and Monitoring Plan (EMMP)
- Recommendations and Conclusions

CHAPTER NO 2
SCREENING AND SCOPING

CHAPTER 2

SCREENING AND SCOPING

2.1 General

This section of the study concentrates on details of the project screening and scoping, and selection of alternatives. The spatial and temporal boundaries are also determined in this section of EIA.

2.2 Type and Category of Project

As per Review of Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) Regulations, 2022 the subject project does not fit in any category so after consultation with EPA Officials, an EIA is submitted by categorizing the project in **"B(5)"**category of **Schedule II.**

2.3 Objectives of Project

Following are the main objectives of said housing scheme:

1. To manufacture quality decorative papers.
2. To provide employment to the people
3. To promote local goods to increase the GDP of company
4. Minimization of environmental impacts by adopting best management practices.

2.4 Alternatives

The analysis of the alternatives is a part of the EIA process to select the best among all possible project options. The alternatives of a project are defined as the options that can help to meet the objectives of a project by different means including alternative project sites, Environmental alternative etc. The key criteria when identifying alternatives is that they should be feasible and reasonable.

Selection of preferred alternative is based on scores of factors including cost, schedule of delivery, environmental and social impact and the cost for their redressal. The drivers that affect

potential alternative options and scenarios include: availability of project sites, current technologies; design changes that need to be introduced, operational situation, capital & recurrent costs, environmental & social issues, their potential impacts, and costs of mitigation.

The details of the site alternatives and project alternatives are discussed below

2.4.1 **Site Alternatives**

No other site alternative was available to be considered as feasible option for the installation of the plant as proposed project site is owned by the M/S G & Z Paper (Pvt) Ltd and the project site is located in designated industrial area i-e Sundar Industrial Estate. The proposed site is selected because of the following reasons;

- The selected site is located in the proximity of other industries
- The site is well connected to the other parts of the country through National Highway.
- No human settlements displacement or relocation is associated with the project development and operation
- Operation of the aforesaid unit in the respective zone will provide job opportunities to local people and will improve their socio-economic status of the study area.

No important religious, archaeological, recreational site or ecologically/declared protected area and human settlement exists within close proximity of the selected site. In view of these facts, it can be concluded that the selected site is best suited for the project, and will not pose any adverse impact or threat on any component of the environment.

2.4.2 **Project/ Technology Alternative**

No project alternative is feasible to be considered as the latest machinery will be used.

2.4.3 **Labor**

Cheap labor has always been the backbone of the economy of Pakistan. Cheap and ample supply of labor strengthens the industrial and agriculture sector of the country. There are approximately 7 upstream and 6,000 downstream production units in the country which provide employment

directly and indirectly to ~ 600,000 people. Of the downstream units, only 700 belong to the organized sector while the remaining 5,300 units operate in the unorganized sector. Also, this project will emphasize to hire local labors as many as possible increasing the occupational status of the area.

Considering the above-mentioned factors, no project alternative can be envisaged.

2.4.4 **Environmental alternatives**

It was considered before selecting the site that no Environmental Sensitive area, Natural reserve, forest, agriculture natural surface bodies falls near the project site. The purpose of conducting EIA is to conduct the detailed analysis of site and if any issue arises, it will be mitigated with true spirit.

2.4.5 **Economic Alternative**

Energy efficient machineries will be installed which will utilize the low power supply. The building will be constructed by following Green Building Laws which will also incline the graph towards optimal use of resources and enhance the ability to utilize the natural resources.

CHAPTER NO 3
PROJECT DESCRIPTION

CHAPTER 3: DESCRIPTION OF PROJECT

This section of the study concentrates on details of the project and its salient features; such as its location, objective, site layout, cost and magnitude of operation at various phases and process employed for the subject process.

3.1 Particulars of Project Site

Details of location of project are provided in table below:

Table 3-1: Particulars of Project Site

Particulars	Details
Latitude	31°39'24.8"N
Longitude	73°12'40.0"E
Location	Plot No 147, Sundar Industrial Estate, Lahore
District	Lahore
Nature of area	Industrial (Sundar Industrial Estate)
Road connectivity	Sundar Industrial Road

3.2 Location and Layout of Project

3.2.1 Location of the Project

Project site is located at Plot No 147, Sundar Industrial Estate, Lahore. Google map is given below:

Figure 3 Location Map of Project Site

3.3 **Nature of Area**

Said area is industrial in nature.

3.4 **Land Ownership**

The land is owned by M/S G & Z Paper (Pvt) Ltd. Site allotment letter has been attached as **Annexure II.**

3.5 **Government Approvals**

Management has applied for the approvals from different concerned departments. Once the NOCs will be obtained from different departments, will be provided to EPA.

3.6 **Land Use on Site**

The land use on the site will be industrial in nature. There is no settlement, grassland or preserved area in the proximity of the project area that could be damaged or dismantled.

3.7 **Road Access**

The said Project area has road accessibility as it is accessible through Sundar Industrial Road through Main Raiwind Road.

Figure 4 Road Access

3.8 **Vegetative Features on Site**

The area around the project area is industrial cum agricultural. The main crops grown around the project area includes; maize whereas, the vegetative features of the area include; Neem and Keekar.

3.9 **Cost and Magnitude of Operation**

Cost includes land cost, Building & Infrastructure cost, machinery cost, land scaping cost. Total cost of the project is PKR 180 Million (Approx.).

3.10 **Schedule of Implementation**

The schedule of implementation for the commencement of the civil work involved for the installation construction and operational maintenance is approximately 24 months and the detail timeline of the construction period is given in Table below:

Table 3-2: Timeline for Project Development

Sr. #	**Activities**	**6 Months**			**6 Months**			**6 Months**			**6 Months**		
		8W	8W	8W	8W	8W	8W	8W	8W	8W	8W	8W	8W
1	Detailed Designing												
2	Mobilization of Contractors												
3	Lean Development Period												
4	Peak installation Period												
5	Commissioning												*
W=96 Weeks													

3.11 **Description of the project:**

Project description is given in details in the preceding.

3.11.1 **Manufacturing Process**

The manufacturing process will be physical process which are explained with the help of flow chart diagram and description of each step:

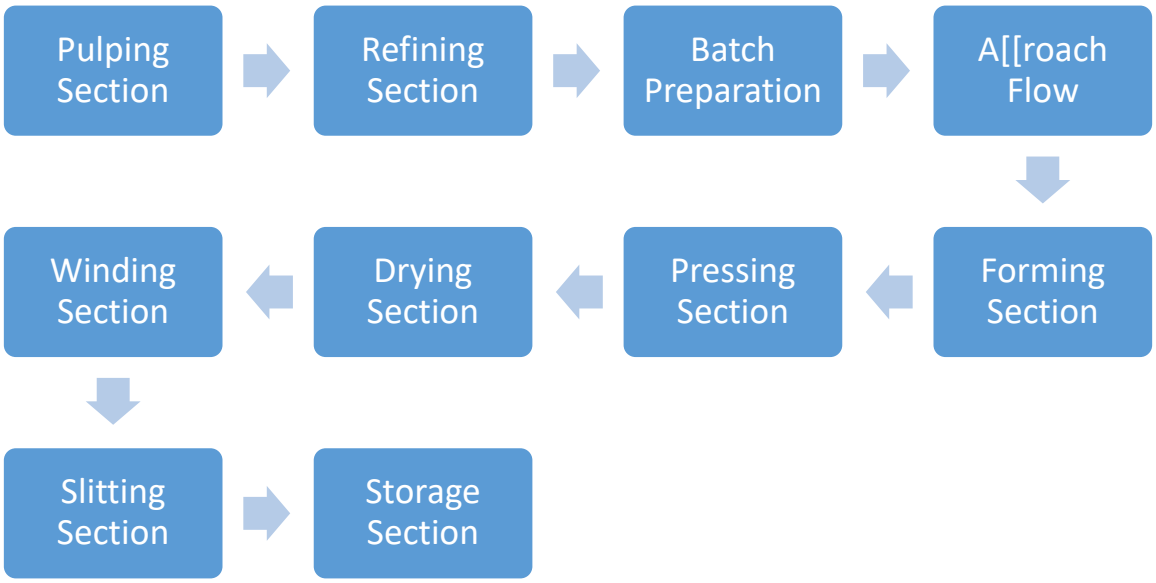


Figure 5 Process flow for paper manufacturing at G & Z Paper (Pvt) Ltd

Pulping procedure will be done to separate and clean the fibers

2) Refining procedure will be followed after pulping processes

3) Dilution process to form a thin fiber mixture

4) Formation of fibers on a thin screened

5) Pressurization to enhance the materials density

6) Drying to eliminate the density of materials

7) Finishing procedure to provide a suitable surface for usgae

In the fiber separation stage, several pulping technologies will be diverged. The chips are kept into a large pressure cooker (digester), into which is added the appropriate chemicals in kraft chemical pulping.

The chips are then digested with steam at specific temperatures to separate the fibers and partially dissolve the lignin and other extractives. Some digesters operate continuously with a constant feed of chips (furnish) and liquor are charged intermittently and treat a batch at a time.

After the digestion process, the cooked pulp is discharged into a pressure vessel. Here the steam and volatile materials are tubed off. After that, this cooked pulp is returned to the chemical recovery cycle. Fiber separation in mechanical pulping is less dramatic.

Debarked logs are forced against rotating stone grinding wheels in the stone ground-wood procedure. Refiner pulp and thermo-mechanical pulp are produced by chips. These chips are ground by passing them through rapidly rotating in both processes.

In the second stage after refining, the pulp is screened, cleaned, and most of the process water is removed in preparation for paper making.

Bleaching Process

Raw pulp contains an appreciable amount of lignin and other discoloration, it must be bleached to produce light colored or white papers preferred for many products. The fibers are further delignified by solubilizing additional lignin from the cellulose through chlorination and oxidation. These include chlorine dioxide, chlorine gas, sodium hypochlorite, hydrogen perioxide, and oxygen.

Sodium Hydroxide, a strong alkali is used to extract the dissolved lignin from fibers surface. The bleaching agents and the sequence in which they are used depend on a number of factors, such as the relative cost of the bleaching chemicals, type and condition of the pulp.

Mechanical pulp bleaching varies from chemical pulp bleaching. Bleaching of mechanical pulp is designed to minimize the removal of the lignin that would reduce fiber yields.

Chemicals used for bleaching mechanical pulps selectively destroy coloring impurities but leave the lignin and cellulosic materials intact, These include sodium bisulfite, sodium or zinc hydrosulfite (no longer used in the United States), calcium or sodium hypochlorite, hydrogen or sodium peroxide, and the Sulfur Dioxide-Borol Process (a variation of the sodium hydrosulfite method).

Papermaking Procedure

Bleached or unbleached pulp may be further refined to cut the fibers and roughen the surface of the fibers to enhance formation and bonding of the fibers as they enter the paper machine.

Water is added to the pulp slurry to make a thin mixture normally containing less than 1 percent fiber. The dilute slurry is then cleaned in cyclone cleaners and screened in centrifugal screens before being fed into the 'wet end' of the paper-forming machine. The dilute stock passes through a head-box that distributes the fiber slurry uniformly over the width of the paper sheet to be formed.

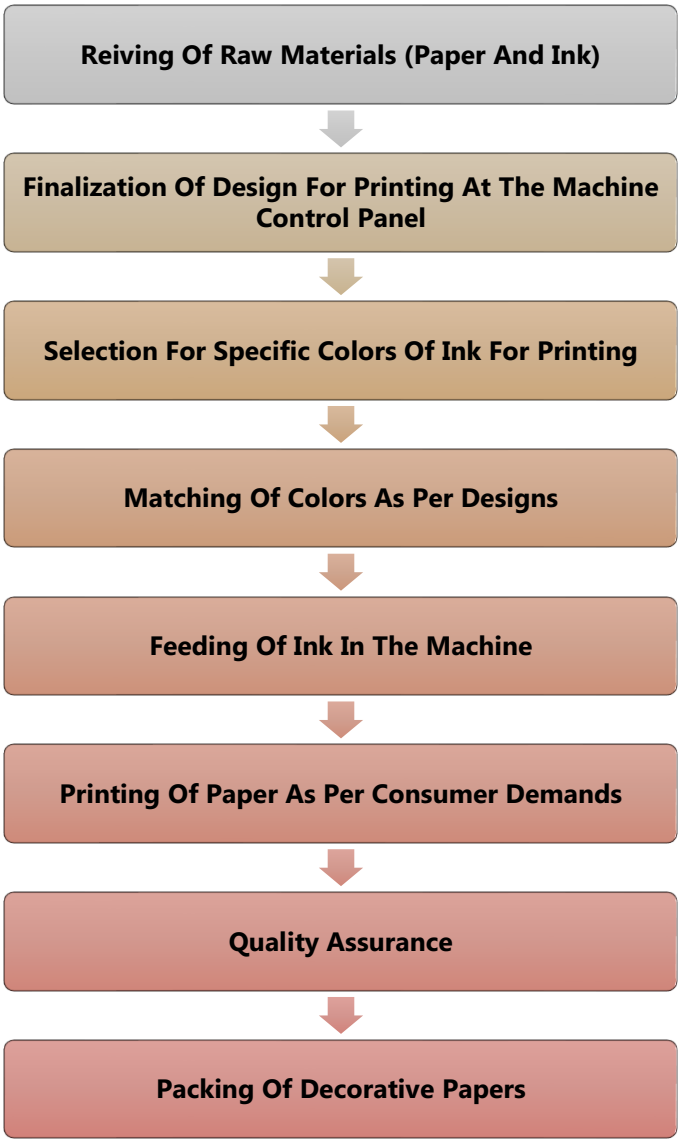


Figure 6 Process Flow Diagram

Process of Decorative Papers Manufacturing:

1. **Receiving of Raw Materials**

The raw materials include:

1. Paper
2. Inks

2. Finalization of Design

The printing designs on decorative papers will be finalized on the control panel of the machine. These designs may vary and depends as per consumer demands.

3. Selection of Ink

As per the selected designs, the ink colors will be selected. These colors will be inspected in Quality lab to be checked as per sample requirements. When the recipe of ink is prepared this ink will be filled in the printing machine for initiation of process.

4. Final Printing

When the ink will be filled paper sheet from one end will be fed and printing of decorative papers will start by just one click from control panel. At the other end final product will be obtained and packed in larger sheets to supply the consumer.

Design Creation:

Hi Tech Real Wood scans

AVA CAD Software

Digital Printing

3.12 Relocation and Rehabilitation Plan

There exists no human settlement within premises of the selected project site to be displaced as a result of the proposed project. Moreover, no structure of any significance stands at the site is proposed to be relocated. The project area is owned by the company. So, no restoration and rehabilitation are required.

3.13 List of Machinery

The detailed list of machinery for each process is presented below.

Sr. No	Machinery
1.	Printing Machine
2.	Boiler

3.	Air Compressor
4.	Transformers
5.	Dryer Cylinders
6.	Refiners
7.	Headbox
8.	Tanks
9.	Rolls
10.	Scanners
11.	Motors with Electrical Pannels
12.	Cutter
13.	Conveyer Belt

3.14 Amenities

The following social amenities are present at site and the management of the waste (construction waste, solid waste and effluents) is explained in sub-sections below:

3.14.1 Electricity Consumption

WAPDA would be the main power source of electricity supply. 100 KVA backup generator will also be installed.

3.14.2 Heat Source

A boiler of 8 TPH will also be installed for steam generation. The fuel will be biomass.

3.14.3 No of workers

Total 170 workers that include direct and idirect workers will be hired for the proposed project.

3.14.4 Ground Water Resource

During constructional and operational phase ground water will be consumed. The water will be pumped from ground from the depth of 220ft. Total requirement of water in Operational phase will be $20m^3$/ton of production of paper.

3.14.5 Management Plans

Following management plans will be employed to reduce the impact of the proposed activity:

3.14.5.1 Air Emissions

Air emissions will be generated while continuous operation of generator and boiler may deteriorate the quality of air in the open area..

To deal with the pollution generated from these activities, regular monitoring and testing of generator will be carried out to ensure compliance. Biomass fired boiler will be installed to handle the air emissions effectively To reduce the public nuisance native trees will be planted on the boundary to reduce the nuisance and to reclaim the disturbed soil effectively.

3.14.5.2 Wastewater Management and Disposal

In the proposed project the wastewater will be generated from, municipal and domestic activities only. There will only be 1 % generation of wastewater from the water requirement from process which will be treated primarily and the results of the final discharge water will be maintained according to the PEQS and then discharge to sewerage lines of Sundar Industrial Estate.

3.14.5.3 Waste Management

The solid waste will be generated during the cooking in the worker's mess and during process. The expected waste points are packaging waste, cut parts, tapes, papers and Daily scrap from municipal activities. Integrated waste management system will be adopted for proper segregation, handling and treatment. The maximum waste produced from process will be recyclable in nature. Approximate value for waste is 0.2 ton of total production capacity.

3.14.5.4 Emergency Preparedness

Project Manager will be the head of the team who will chair the Committee. In the case of emergency, he will immediately inform the concerned authorities. HSE Manager will be responsible for on-site HSE management.

3.14.5.5 Safety Trainings

Skilled, semi-skilled and un-skilled staff will be provided with proper training about the work and safety practices that need to adopt during the process activities.

3.14.5.6 Use of Drugs and Narcotics

Drugs and narcotics are strictly prohibited during working hours in working area. Smoking will be only allowed during rest timings at properly isolated places.

3.14.5.7 Personal Protective Equipment

Following Personal Protective Equipment (PPEs) will be provided to the workers:

- Safety Helmet
- Safety Shoes
- Safety Gloves
- Safety goggles
- Ear plugs/ muffles

3.14.5.8 Fire-Fighting Arrangements

All fire protection systems will comply with Local regulations. The building design shall meet the requirement of the above standards & regulations such as fire resisting duration, safety distance of buildings, interior isolation firewall & door.

CHAPTER NO 4
DESCRIPTION OF THE ENVIRONMENT

CHAPTER 4: DESCRIPTION OF THE ENVIRONMENT

4.1 GENERAL

This section describes the baseline conditions, which cover the existing physical, ecological, and socio-economic environment of the Project Area. Information on these aspects has been derived from the desk study of available data, field visits to the project area as well as information obtained through visits to the Government departments and other relevant agencies.

4.2 DATA COLLECTION

The primary data was collected by surveying the project area and its nearby vicinity. The secondary data regarding physical parameters (topography, geology, seismology, hydrology and climatology) was obtained by visiting relevant departments and their official websites. The biological parameters (flora and fauna) were also studied in the project area. The vegetation of project area was studied by preparing a floristic list based on visual observation. The species were recorded with reference to their historical existence in the project area.

Information on wildlife fauna species (mammals, amphibians, reptiles, birds, etc.) in the assessment area was compiled based on opportunistic observation, gathering the existing information and consultation with local experts, community members, government and Non-Government Organizations (NGOs). The socio-economic aspects were studied and analyzed by conducting detailed village profile and household surveys.

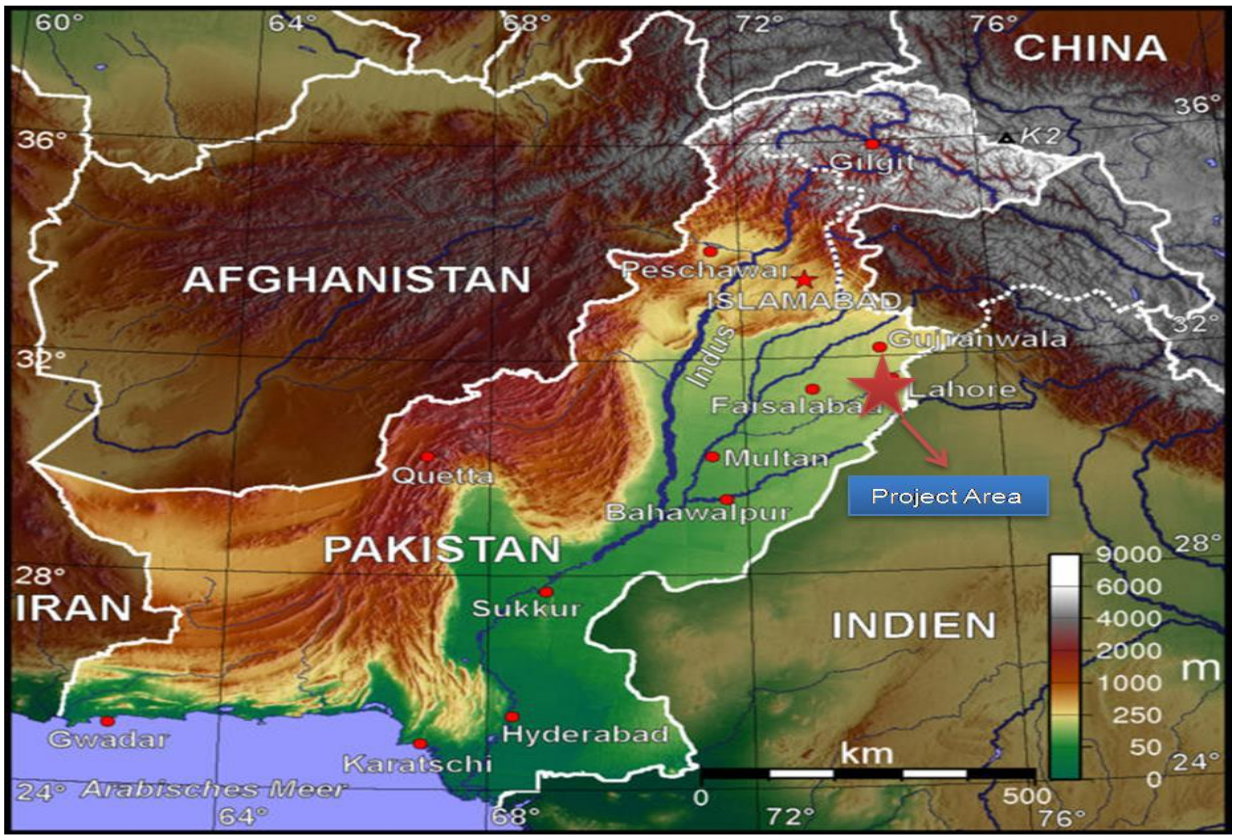
4.3 PHYSICAL ENVIRONMENT

This part examines the physical resources such as topography, soil, climate, surface and ground water resources and quality, ambient air quality and geology of not only the Project site but also the city as a whole 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 present in the following sub sections.

4.3.1 **Topography**

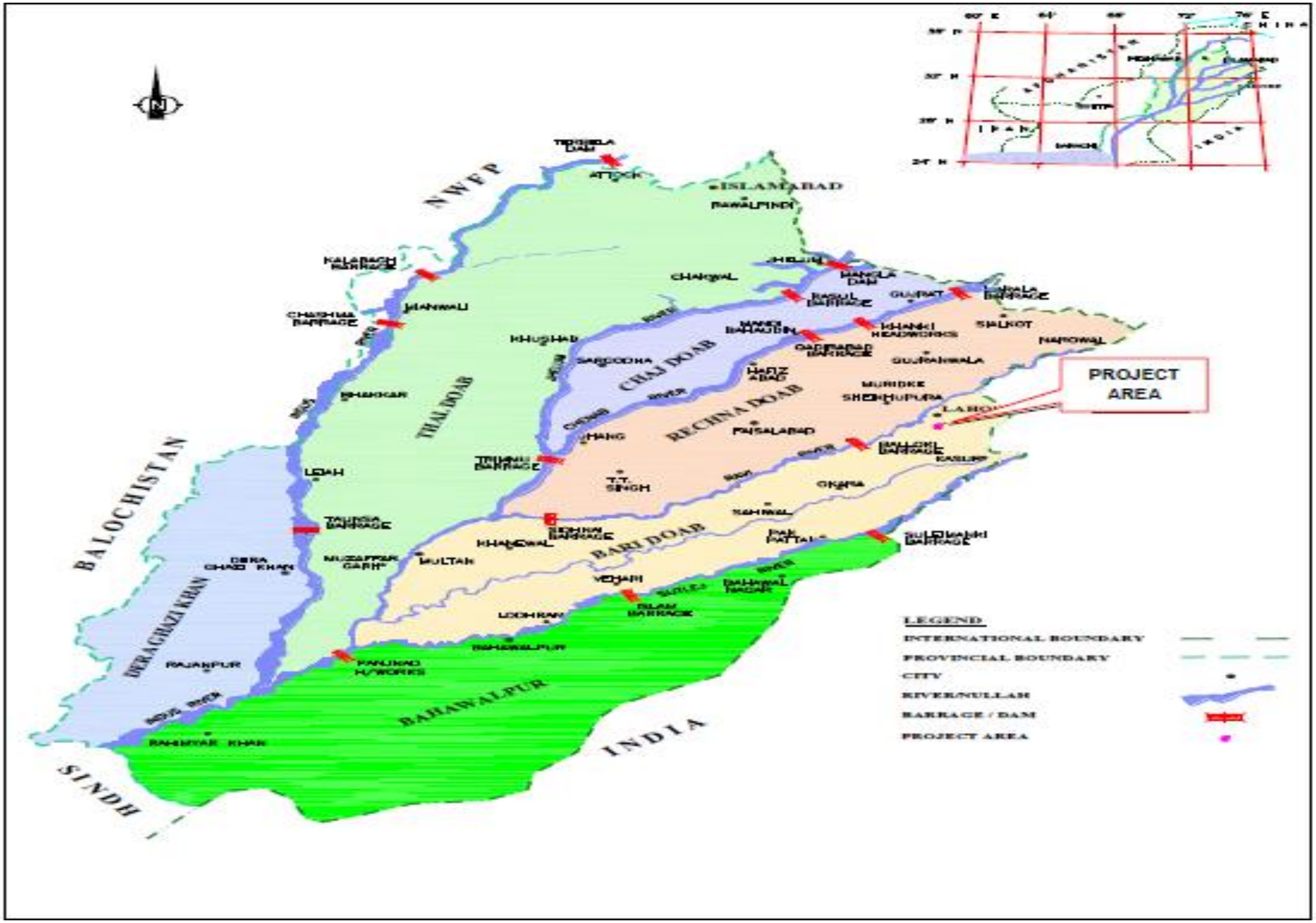
The topography of the project area is flat. The General height of the area is approximately 220 meters above the Mean Sea Level (MSL). The district Lahore is divided into two parts. The low lying alluvial soil is along the Ravi River, and the upland in the east. Upland is a plain slope from north-east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



Reference: Environmental Impact Assessment of construction of alternate route to circular road from New Azadi Chowk to Masti Gate by Fizza Batool.

4.3.2 **Hydrology and ground water**

The Study Area forms the upper part of Punjab plain, which is a part of the Indo-Gangetic depression. This depression is of a synclinal nature. Synclinal depression is a fore deep downward of the Himalayan foreland of variable depth, converted into flat plains by simple process of alluvial deposition. It is part of the large inter alluvial upper Bari Doab, which is bounded by the Ravi River in northwest and the Sutlej River to the southeast. The Bari Doab along with other Doabs like Rechna, and Chaj form the vast alluvial plain of the upper Indus Plain in Punjab.


PROJECT AREA
NWFP
BALOCHISTAN
SINDH
INDIA
ISLAMABAD
THAL DOAB
CHAJ DOAB
RECHNA DOAB
BARI DOAB
BAHAWALPUR
LEGEND
INTERNATIONAL BOUNDARY
PROVINCIAL BOUNDARY
CITY
RIVER/NULLAH
BARRAGE / DAM
PROJECT AREA

4.3.3 **Climate & metrology**

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

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

The project area receives rains in all the seasons but monsoon rain is pronounced and constitutes a definite rainy season between the month of July and September. The average rainfall is about 629 millimeters per year.

Table 4-1: Average Monthly Temperature, Precipitation and Relative Humidity (2004-2008)

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

Source: *Meteorology Department Lahore*

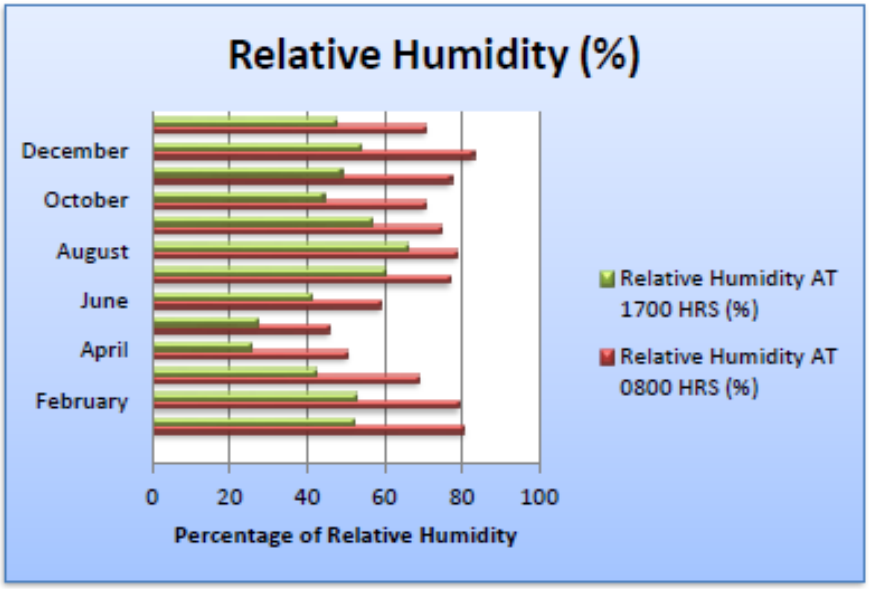


Figure 7: Relative Humidity in the Study Area (2005-2008)

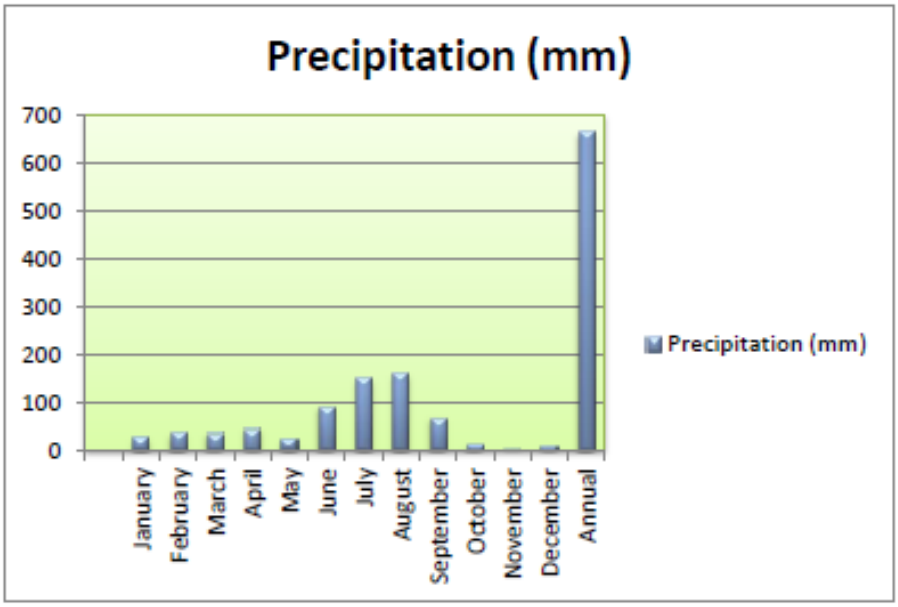


Figure 8: Average Rainfall in the Project Area (2004-2008)

Table 4-2: Wind Speed and Direction 2008

Wind Speed m/sec	N	NE	E	SE	S	SW	W	NW	All Dir.
0									4906
1	2	2	9	4			3	3	23
2	74	108	120	162	51	87	199	132	836
3	72	235	70	258	26	174	163	320	1318
4	34	49	39	101	5	41	112	75	456
5	51	103	25	151	13	73	64	221	701
6	18	10	18	22	3	4	14	23	112
7	20	41	3	42	5	19	16	52	195
8	7	2	2	3			3	8	25
9	10	9	2	15		1	13	11	49
10	12	5		6		1	31	5	32
11	1							3	5
12	1	1				1	1	4	7
13		2		1			1	3	7
14							1	1	2
15	2					1		1	5
16									
17								1	1
18	1					1	1	2	5
19									
20 or above	1					1			2

Source: Meteorology Department Lahore

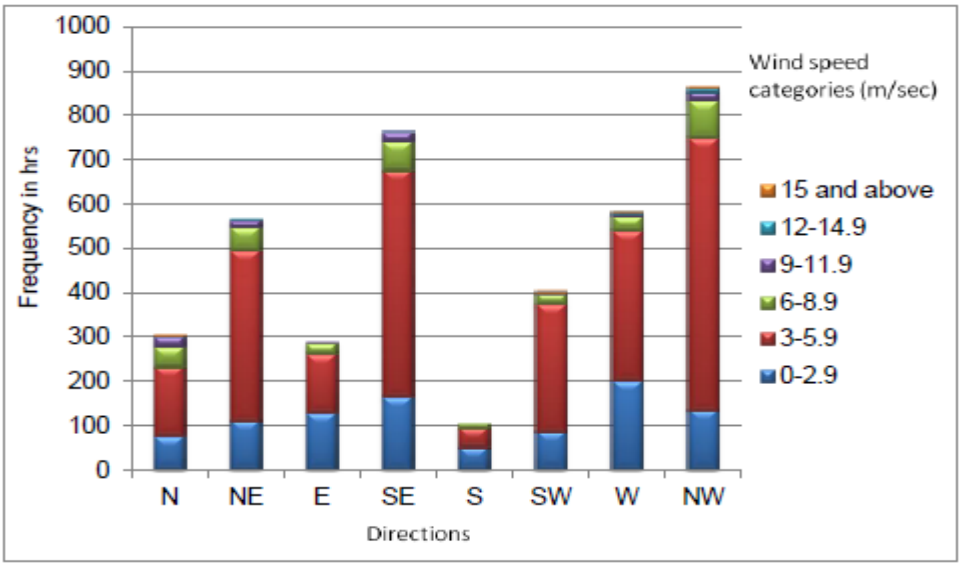


Figure 9: Wind Speed and wind direction in the city of Lahore 2008.

Reference: EIA of Construction of Lahore Orange Line Metro Train Project (Ali Town -Dera Gujran)

4.3.4 **Noise Level**

Noise level in different areas of Lahore is as follows:

Sr. #	Location	Max. Noise Level (dB)
1	University of Lahore	82.9
2	Mansoora	87.0
3	Chouburji	81.6
4	GPO Chowk	73.4
5	Daroghawala Chowk	76.3
6	Jamia Masjid Anwar e Madina	83
7	Himayat e Islam .College	80.6
8	Australia Masjid	81.3
9	Ali Hospital	84.5
10.	UET Gate No. 3	70.3
	NEQS Limit	**80**

4.3.5 **Ambient Air Quality**

Atmospheric pollution, particularly in urban areas like Lahore, has a strong impact on daily life. Motor vehicles are a major source of air pollution. Factories and cottage industry inside the Lahore City are also contributing to air pollution. Sulphur dioxide (SO2), Nitrogen dioxide (NO2), Carbon dioxide (CO2), Carbon monoxide (CO), Ozone (O3) and particulate matter (PM10) are considered pollution indicators. Air quality of Lahore at different points is as follows:

Sr. No.	Location	Monitoring Duration	Parameters			
			NO_x µg/m³	SO_2 µg/m³	CO mg/m³	PM_{10} µg/m³
1.	UOL	24 hr	<0.01	<0.01	2.1	284.17
2.	Mansoora		<0.01	<0.01	3.24	269.83
3.	GPO		5.15	18.03	1.93	110.3
4.	Daroghawala		6.04	18.32	2.07	120.37
5.	Chouburji		26.33	25.26	2.81	202.65
6.	Jamia Masjid Anwar e Madina		<0.01	<0.01	1.16	176.04
7.	Himayat e Islam .College		<0.01	<0.01	1.80	150.04
8.	Australia Masjid		<0.01	<0.01	1.79	148.75
9.	Ali Hospital		19.75	25.26	2.26	155.42
10.	UET Gate No. 3		11.01	19.20	1.51	131.5
		NEQS Limit	**120 for 24 hrs**	**120 for 24 hrs**	**5 for 8 hrs**	**150 for 24 hrs**

4.4 BIOLOGICAL ENVIRONMENT

4.4.1 **Flora**

Several types of floral species are present in Lahore as well as project area, however, some of the principal trees, are given below in Table

No.	Common Names	Botanical Names
1	Arjun	*Terminalia arjuna*
2	Dhak	*Butea frondosa*
3	Mahwa	*Bassia latifolia*
4	Bahara	*Terminalia bellerica*
5	Amaltas	*Cassia fistula*
6	Gul-e-nishter	*Erytrina subrosa*
7	Barringtonia	*Barringtonia acutengula*
8	Nim	*Melia indica*
9	Gab	*Diospyores embryopteris*
10	Berna	*Crateva religiosa*
11	Khark	*Celtus australis*
12	Putajan	*Putranjiva roxburgi*
13	Fiddle wood/Kashmir Lagotis	*Eithroxyllum ruberratum*
14	Gul-e-mast	*Dalinia indica*
15	Gul-e-mohr	*Poinciana regia*
16	Alstonia	*Alstonia scholaris*
17	Ashoke	*Saraca indica*
18	Sheesham	*Dalbergia sisso*
19	Alata	*Stercolia colorata*
20	Kenair	*Nerium grandiflora*
21	Weeping Willow	*Salix babylonica*
22	Keekar	*Parkinsonia aculeata*
23	Nilem	*Jacaranda mimosfolia*
24	Kachnar	*Bauhinia purpurea*
25	Molsary	*Mimosop elengi*
26	Bel	*Aegle marmelos*
27	Siris	*Albizia lebbek*
28	Tun	*Cedrela toona*
29	Jamin	*Eugenia jambolana*
30	Moor pankh	*Thuja orientalis*
31	Silkoak	*Grevillea robusta*

4.4.2 **Fauna**

Mammals

Common mammals found in the area are dogs, cats, house rats and bats.

Reptiles

Snakes such as cobra, kraits etc. were once common in the tract, but now cases of snake bites are very rare, as these reptiles have been either killed by expanding urbanization or they have moved away. Lizards such as Spiny tailed lizard (Uromastix hardwickii) and fringed toed lizard (Acanthodactylus cantoris) are also reported by the residents of the area.

Amphibians

Amphibians frequently seen in and around the project area, especially during rainy season, include common Frog (Rana tigrina) and Indus valley toad.

Birds

House sparrow (Passer domesticus), House crow (Corvus splendens) and Mynah (Acredotheres tristis) are the most common sight in the area.

There are no endangered species of flora and fauna in the Study Area.

4.5 SOCIOECONOMIC ENVIRONMENT

Socio economic environment is represented by the human and economic development and quality of life values. For the study of socio-economic environment of the project area, field surveys were conducted and interviews were held with the general public and neighbors. The baseline conditions of the city are as follow:

4.5.1 Demography

The total population of Lahore District was 6,318,745 as enumerated in March 1998 with an intercensal percentage increase of 78.3 since March 1981 when it was 3,544,942 souls. The average annual growth rate of population in the district during intercensal period 1981-1998 was 3.5 percent. The total area of the district is 1772 square kilometers, which gives population density of 3,566 persons per square kilometer as against 2000 persons observed in 1981 indicating a fast growth rate of the district. Table 4.9 gives population, its intercensal increase and average annual growth rate since 1951 of Lahore district.

Description	1951	1961	1972	1981	1998
Population (in 000's)	1,135	1,626	2,588	3,545	6,319
Intercensal Increase (%)	43.3	59.2	37.0	78.3	-
Average Annual Growth Rate (%)	3.7	4.1	3.8	3.5	-

Source: *DCR of Lahore District, 1998*

Reference: *EIA of Construction of Structural Road from Expo Center to Ring Road (Parallel to Canal Bank Road)*

4.5.2 **Industries**

After Karachi, Lahore is the biggest industrial area in Pakistan. There has been a steady expansion of industries in and around Lahore since independence. There are many large industrial units in the district. These units manufacture cotton, woolen and silk cloths, carpets and rugs, textile products, lather and rubber foot wears, wearing apparel, pharmaceutical goods, soap, iron and steel products, heating, plumbing and lighting equipment, hardware, miscellaneous fabricated products, agriculture machinery, engines and turbines, textile machinery, printing machinery, metal working machinery, pumps and compressors, household machinery, water generators, motor generators, transformers, electric fans, communication equipments, cycles and rickshaws. There are also a good number of printing and publishing units and body building workshops. Besides, there are units of canning and preservation of food, edible oils, beverages, metal and wood furniture, rubber products, chemicals, glass products, repair of railway equipment, toys, stationary etc. Industries nearby site are:

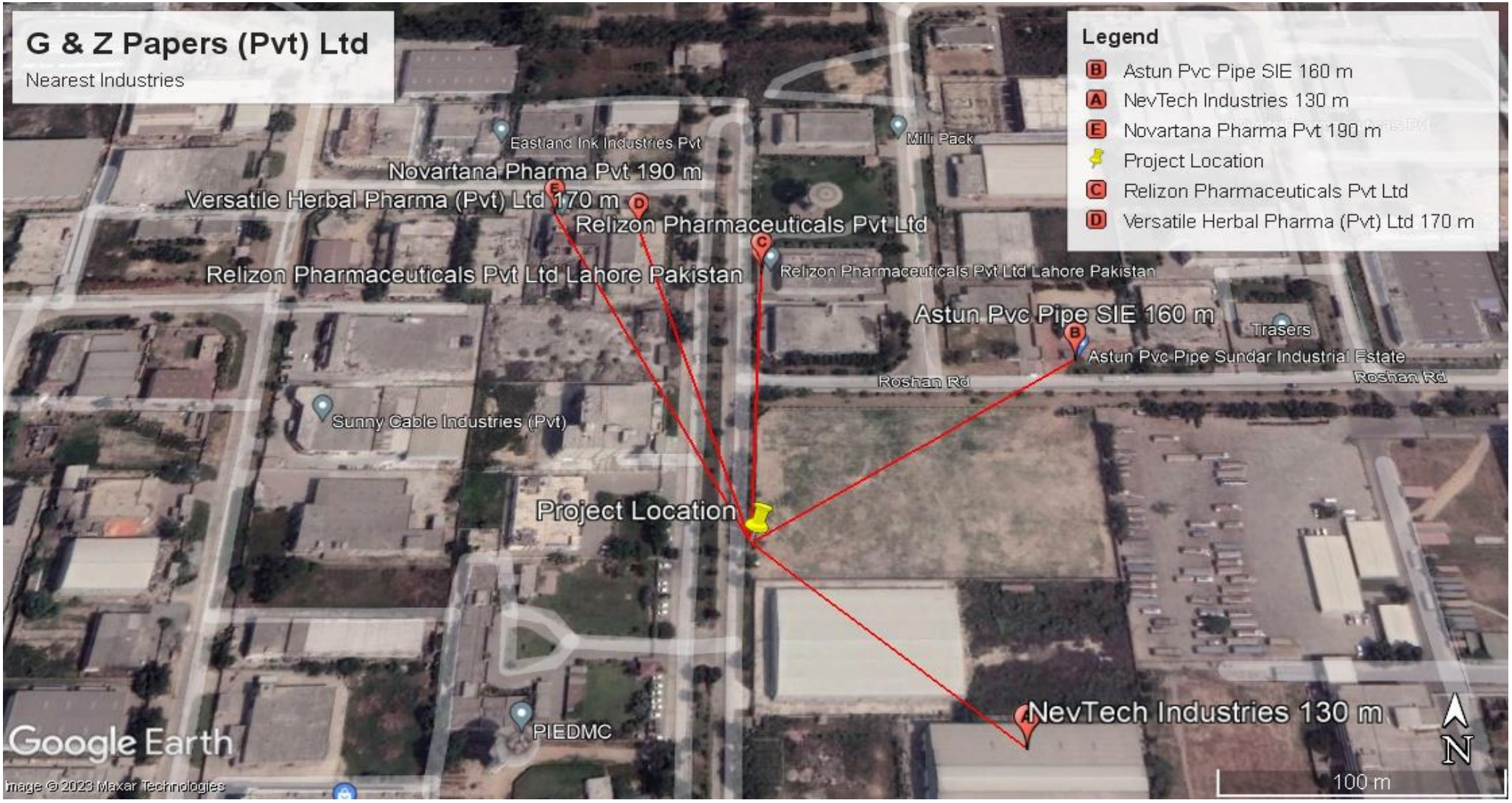


Figure 10 Map showing nearby industries

4.5.3 **Educational facilities**

In the project area some educational institutions are found which include Allied School, Kips School, Dar-e-Arqam School and Punjab School. Overall in Lahore, educational facilities are mainly being provided by the Government of Punjab, the city government and the private sector and voluntary organizations. Educational facilities nearby project site are:

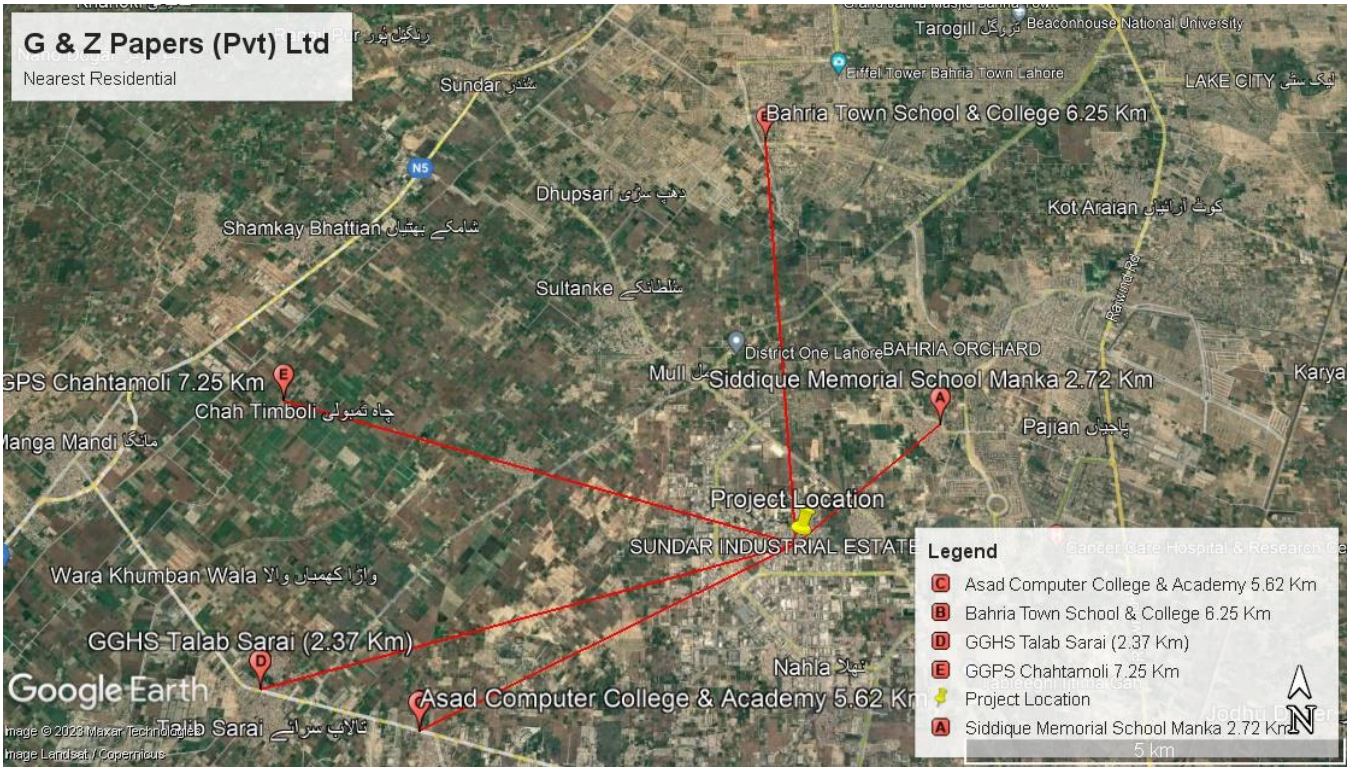


Figure 11 schools near to project site

4.5.4 **Health facilities**

Health facilities nearby site are:

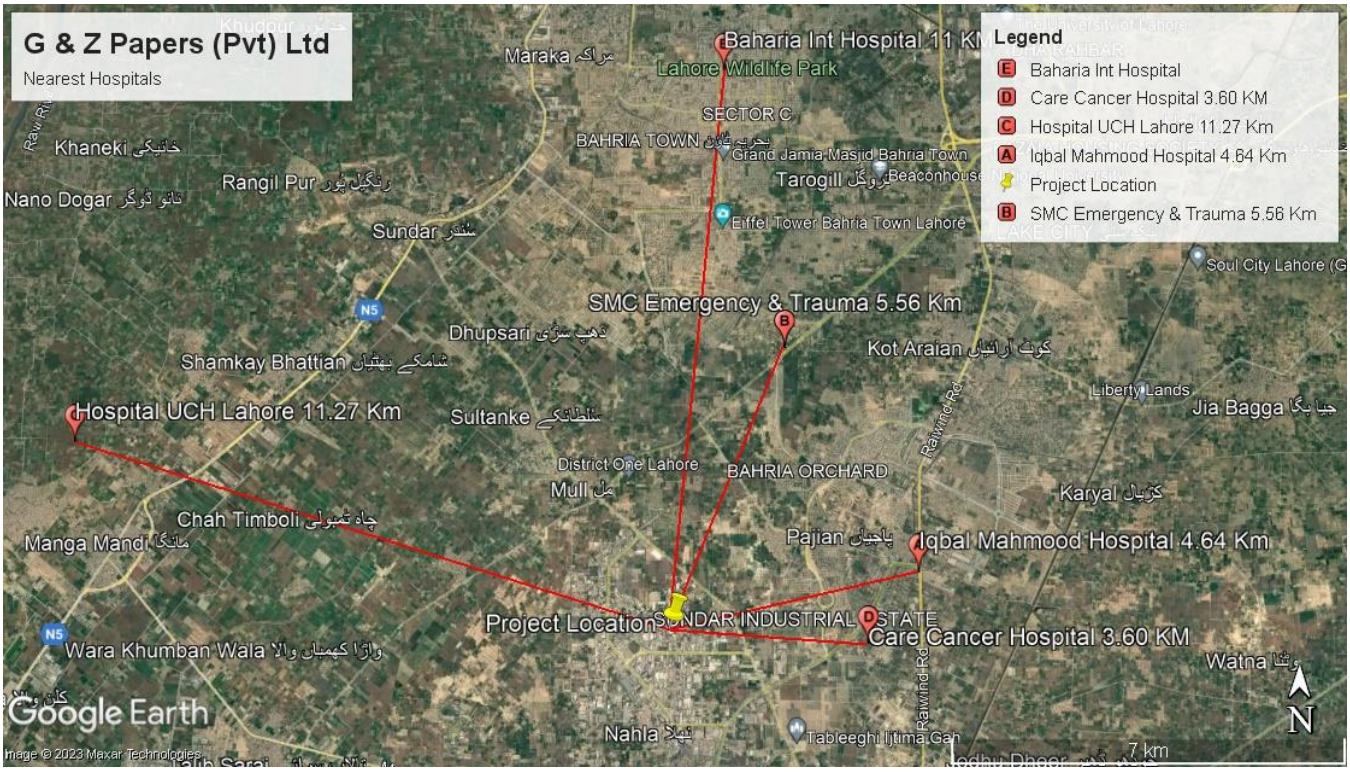
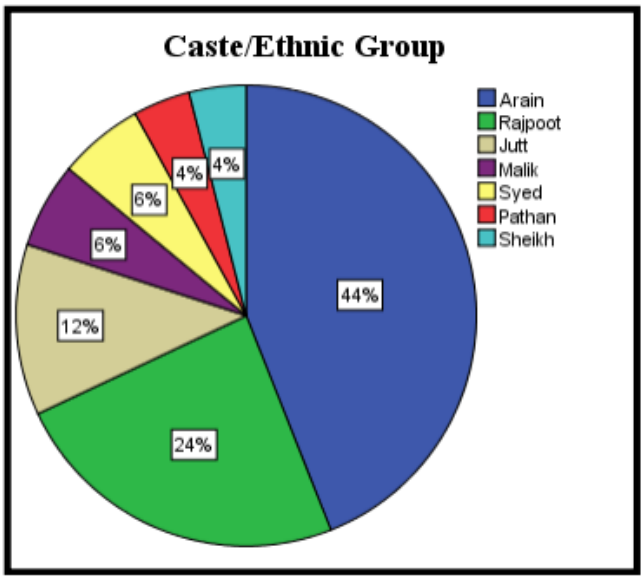


Figure 12 Nearby educational facility

4.6 Quality of life values

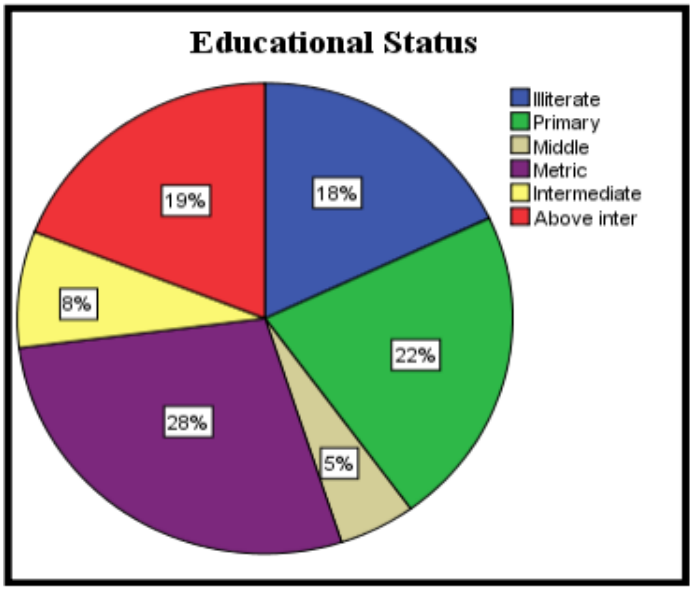
4.6.1 Caste / Ethnic Group

According to baseline survey, it was found that the largest part of the respondents i.e. 44% were Arain. While 24% were Rajputs, 12% were Jutt and 06% were Syed and Malik each. While 04% were Pathan and Sheikh each.



4.6.2 **Educational Status of the Respondents**

Educational attainment for sampled population of project area is not very low because out of 100 respondents, only 18% were illiterate. Primary school respondents were 22%. While 06% went to middle schools, 28% were up to metric level, 08% had passed the intermediate and 19% of the total respondents had got education above intermediate.



4.6.3 **LAB REPORTS OF ENVIRONMENTAL ANALYSIS**

Testing of different parameters was done by EPA certified laboratory to check the quality of different environmental parameters. The copy of the lab reports of these parameters (ambient air analysis, water quality analysis and noise) is given in annexure.

CHAPTER NO 5
STAKEHOLDER CONSULTATION

CHAPTER 5: STAKEHOLDER CONSULTATION

5.1 GENERAL

Public consultation refers to the process by which the concerns of local affected persons and others who have plausible stake in the environmental impacts of the project or activity are ascertained with a view to taking into account all the material concerns in the project or activity design as appropriate. Impact assessment survey and public consultation sessions held with different stakeholder groups that may be impacted by the said project development. The consultation process was carried out in accordance with the guidelines laid by EPA. The objectives of this process were to:

- Share information with stakeholders on said project installation and operation
- To access the impacts on the physical, biological, and socio-economic environment
- Understand stakeholder concerns regarding various aspects of the project
- Understand the perceptions, assessment of social impacts and concerns of the communities of the project area
- Find out the awareness level and situation of acceptability to identify any issues for the implementation of the said project
- To invite people to express their views about the positive/negative impacts on their life styles and environment

This report includes all the comments, which were taken into account in preparing the definitive development concept for the establishment of said project.

5.2 OBJECTIVES OF CONSULTATION

Public consultation plays a vital role in studying the impacts said project on stakeholders in its successful implementation and execution. It provides an opportunity to exchange knowledge with the all stakeholders. Referring particularly to a project related to environmental assessment, involvement of public is all the more essential, as it leads to better and more acceptable decision-

making. The overall objective of the consultation with the stakeholders is to help verify the environmental and social issues, besides technical ones, that have been presumed to arise and to identify those which are not known or are specific to the project.

5.3 IDENTIFICATION OF STAKEHOLDERS

All the people who are directly or indirectly affected or concerned with the project are the stakeholder. Not only published material (Both brief and comprehensive literature were obtained on request) but also noted their views and the concerns. Following stakeholders are identified for this project:

Project stakeholders include the settled families, either property owners or the tenants, businessmen (land owners, traders, shopkeepers, vandors, transporters, restuarent owners etc.), employees of the commerical entities. PAPs are of two types, for instance:

5.3.1 **Direct**

In this case, the PAPs are those who will be benefited directly by project. No disturbance on the local community is being foreseen due to the installation of the said plant.

5.3.2 **Indirect**

Indirect impact will occur on those who are living or doing business within project area of influence. Indirect respondents include;

- ✓ Government agencies responsible to deal with the project related activities
- ✓ Government Agencies directly, indirectly or widely involved in the execution and monitoring of the said project
- ✓ Workers of political, cultural, religious or social scientific bodies, directly or indirectly related

5.4 PUBLIC DISCLOSURE

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

5.5 CONSULTATION PROCESS

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

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

Various meeting with the stakeholders were held the following objectives:

- Share information with stakeholders on the said project and expected impacts on community in the vicinity of the project
- Understand stakeholders' concerns regarding various aspects of the project, including the existing condition of the upgrading requirements, and the likely impact of construction and operation activities
- Provide an opportunity to the public to influence the project design in a positive manner
- Obtain local and traditional knowledge, before decision making
- Increase public confidence about the proponent, reviewers and decision makers
- Reduce conflict through the early identification of controversial issues, and work through them to find acceptable solutions

- Dissemination of information through discussions, education and liaison
- Documentation of information narrated by the stakeholders and mitigation measures proposed by the stakeholders
- Incorporation of public concerns and their address in the EIA; and eliciting their comments and feedback

5.5.1 Consultation Methodology

The methodology adopted for consultations is summarized below.

5.5.1.1 Consultation Material

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

5.5.1.2 Consultation Mechanism

Primary stakeholders were consulted during informal and formal meetings held in the project area. The consultation process was carried out in the Urdu language. In addition to providing communities with information on the said project, their feedback was documented during the primary stakeholder consultation. The issues and suggestions raised were recorded in field notes for analysis, and interpretation.

Secondary stakeholder consultations were more formal as they involved government representatives and local organizations, consulted during face-to-face meetings. They were briefed on the IEE/EIA process, the project design, and the potential negative and positive impact of the project on the area's environment and communities. It was important not to raise community expectations unnecessarily or unrealistically during the stakeholder consultation meetings in order to avoid undue conflict with community's leaders or local administrators. The issues recorded in the consultation process were examined, validated, and addressed in the IEE report.

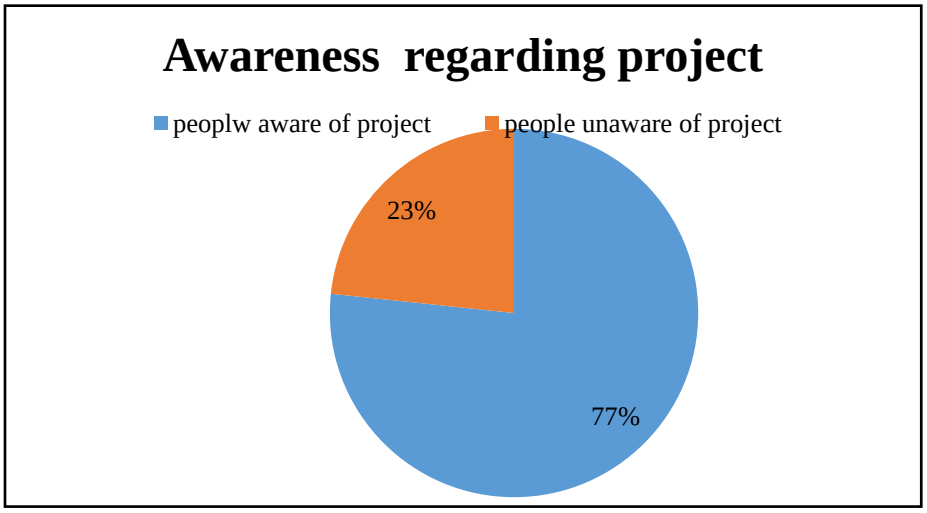
5.5.2 Primary Stakeholders Consultation

The community consultations were conducted with the community members outside their settlements to encourage and facilitate their participation.

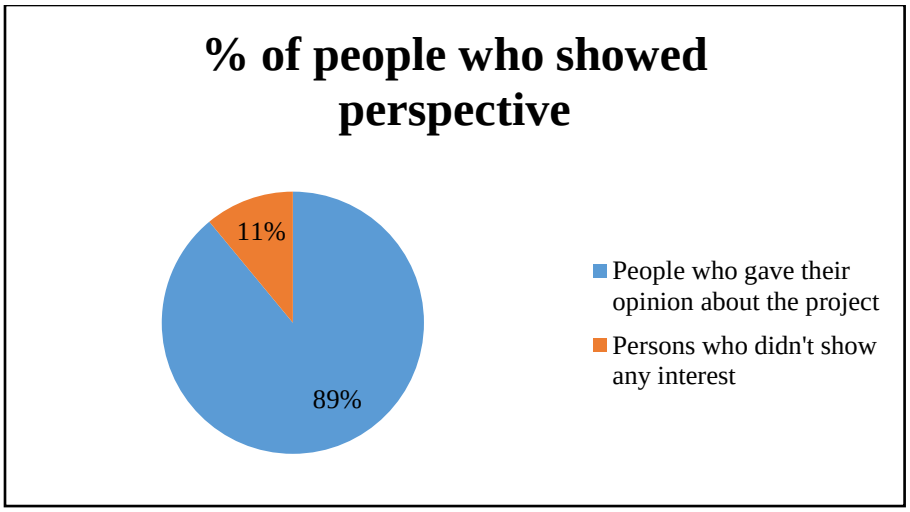
5.5.2.1 STAKEHOLDER CONCERNS AND RECOMMENDATIONS

The finding of the community consultation has been addressed in various sections of IEE. Mitigation plan has been incorporated into EMP. The summary of consultation with various stakeholders is given below

Out of total respondents of, 77% knew about the project whereas 23% were not aware of the project planning and implementation. All people were then briefed about the project.



89% commented their views about the project and 11% didn't respond.



Majority of people were in favor of project. They said that project will result not only in direct jobs opportunities for locals but also will enhance subsidiary business, trade and community development. The people were of the view that industry might also elevate education standards, struggle for career enhancement besides improvement in standard and quality of living in area. People were also of the view that industry may also be instrumental in connecting the local people with major cities and will result in increase in GDP.

5.6 STAKEHOLDERS CONSULTED

Names of consulted stakeholders are given in table below:

Table 5-1: List of consulted stakeholders

Sr. No	Stakeholder name
1.	Muhammad Ibrahim
2.	Abdul Moeez
3.	Asghar Ali
4.	Kashif Rehman
5.	Parvez Hussain
6.	Allah Bukhsh
7.	Muhammad Zulfiqar

8.	Muhammad Tofail
9.	Syed Barat Hussain
10.	Arif Khan
11.	Basheer Hussain
12.	Saddam Hussain
13.	Hameed Ahmad
14.	Muhammad Maqsood
15.	Muhammad Aslam

5.6.1 **Secondary Stakeholders Consultation**

The consultations were carried out with the local government officials and officials of the following departments:

1. District Office Environment
2. Proponent
3. Environmental Precautionar
4. SIE Board

Comments and recommendations of all government representatives are presented in table below:

Table 5-2 Stakeholder Consultaions with officials

S#	Participant	Designation	Concerns/Remarks
Responsible Authority			
1	Muhammad Mumtaz	Inspector Environment	• Environmental enhancement measures such as; Tree plantation, monitoring and safety should be ensured • Should work for local people benefit • Preventive measures should be adopted to avoid any unfortunate incident
Proponent			
1	Ali Anwar	Proponent	• Local employment will be ensured

			• Tree plantation will be done to make project environment friendly • No waste will be dumped improperly • Quality will be ensured
Environmental Practitioners and Experts			
1	Dr. Muhammad Faqir Irfan	PhD. Environment Lawyer	• Health and safety arrangements must be provided
Sundar Board of Management - Industrial Estate			
1	Tehmir Nabi	Environmental Officer	• Tree Plantation should be done • Construction should be completed as per by laws of PIEDMC

CHAPTER NO 6
POTENTIAL ENVIRONMENT IMPACTS AND MITIGATION MEASURES

CHAPTER6: POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

6.1 GENERAL

This chapter describes the potential environmental and social impacts of the proposed activities, predicts the magnitude of the impact and assesses the significance. The main intention of this section is to provide the mitigation measures that need to be adopted wherever necessary, to reduce, minimize, or compensate for the negative impacts.

6.2 IDENTIFICATION OF POTENTIAL IMPACTS

In the first step, potential impacts of the project are identified by desktop screening exercise, using checklists during field visits for collection of baseline data, professional judgment, published literature on environmental impacts of similar projects and standard environmental guidelines. The main aspects associated with potential impacts are as follows:

- Water resources
- Ambient Air Quality
- Waste discharges
- Noise pollution
- Ecology of the area, including flora and fauna
- Vehicle movement
- Socio-economic conditions
- Archaeology

6.3 CLASSIFICATION OF IMPACTS

According to the type of potential receptors, the potential impacts are classified. The following receptor categories were used.

Category of Receptor	Description

Community	People their social and cultural values, aspirations and archaeological sensitivity
Land and Soil	Land resources, soil resources
Air Quality	Ambient air quality
Water Resources	Ground and surface water resources
Ecosystem	Vegetation, wildlife and biodiversity

6.4 SCOPING CRITERIA FOR IMPACTS

The identified potential impacts of the project are evaluated on the basis of following criteria;

- The present baseline condition, the change in environmental parameters likely to be affected by the project related activities;
- Is there any impact that environmental standards or environmental guidelines applicable to the project will be breached?
- Is there a high risk of permanent, irreversible, and significant change to environmental condition due to particular project activity?
- Did the community express any concern about this aspect?

6.5 METHODOLOGY FOR IMPACT ASSESSMENT

The impact assessment methodology defines three levels of consequences (or severity) and likelihood (chance of occurrence) i.e. Low, Moderate/Medium or High. The significance of an impact is determined on the basis of the level of consequence and likelihood of the impact.

Table 6-1: Definitions of severity and likelihood of impacts

Level	Severity of Impact (Consequence)	Likelihood
High	Serious / catastrophic damage to local and regional environment Serious threat to corporate reputation/ profitability / ability to do business	High likelihood of occurrence during lifetime of operation Regular / continuous part of operations
Moderate	Measurable damage to the environment Potential to affect reputation / cost Reduced efficiency	Moderate possibility of occurrence during lifetime of operation Periodic / occasional part of operations
Low	Negligible damage to the environment No risk to business	Unlikely to occur during lifetime of operation

Table 6-2: Impact Significance Matrix

		Likelihood (Probability of occurrence)		
Impact (Consequence)		**High**	**Medium**	**Low**
	High	High	High	Medium
	Medium	High	Medium	Low
	Low	Medium	Low	Low

The prediction of impacts also includes the duration of impacts in terms of short-term or long-term, nature of impact, geographical location of the impact, reversibility of the impact. The criterion for impact assessment is illustrated in the Table

Table 6-3: Impact Assessment Criteria

Impact Characteristics	Categories
Nature of the Impact	**Direct:** The environmental parameters that are directly affecting by this project. **-Indirect:** The environmental parameters change due to the combinational effect by project and environmental impacts
Duration of the Impact	**Short term:** Lasting only till the duration of the project

	Medium term: Lasting from a few months to a year **Long term:** Lasting for a period much greater than medium term impacts
Geographical Location of the impact	**Local:** Within the area of project i.e. operation site and access roads **Regional:** Within the boundaries of the project area **National:** Within the boundaries of the country
Reversibility of the impact	**Reversible:** When a receptor resumes its pre-project condition **Irreversible:** When a receptor cannot resume its pre-project condition

6.5.1 What is the problem?

The project is about printing unit of paper by M/S G & Z (Pvt) Ltd. The major impact associated with the construction and operation of said industry includes solid waste management, wastewater management, noise emissions, tree plantation and fire-fighting arrangements.

6.5.2 When problem will occur and when it should be addressed?

The impacts from the said industry mainly occur during the construction and operational phase of the project. These issues include; noise generation, fugitive dust emissions, solid waste management, top-soil removal, Health and Safety issues and change in the geographic features of the area. These all problems should be addressed on-site where they are being generated, to avoid the residual or adverse impacts.

6.5.3 Where problem should be addressed?

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

6.5.4 How the problem should be addressed?

Problem should be addressed with its full detail i.e. its magnitude, possible impacts and problem, long time effect, environmental impacts, and proper mitigation measures will be provided according to the nature of the impacts/problems.

6.5.5 Ways of Achieving Mitigation Measures:

Following ways will be adopted to reduce the impacts of the said project:

6.5.5.1 Changing in Planning Design

The design of industry is developed considering environmental risk and hazards. As the area is designated industrial zone. Moreover, there is no endangered and threatened species present in the project area. Any human settlement or infrastructure will not be dislocated or dismantled due to the project development. The proper roads and transportation system along with migration measures is there. The project is far away from urban development. Not any impact will affect the urbanization. Hence, there is no need to change the design of the project.

6.5.5.2 Improved Management and Monitoring Practices

The anticipated impacts will be reduced significantly by adopting better management activities, as it will be carried out for the betterment of the society. While environmental monitoring will be conducted on the regular basis to keep the sources of the air pollution, wastewater generation, noise and public nuisances in-check. All the migration measure and advance technology will be implanted to mitigate the impact. All the practices will meet the Punjab environmental standards and international standard like OSHA and EPA.

6.5.5.3 Compensation in Money Terms

Due to the development of the project, no tree cutting is involved, however, there is no protected or environmentally sensitive area present within 5.0 km vicinity of the project that could be impacted. Hence, no compensation in the monetary terms is required.

6.5.5.4 Replacement/Relocation/Rehabilitation

The project site is owned by the proponent and reserved for the said industry. No replacement, relocation and rehabilitation is required for the commencement of the aforesaid project.

6.6 Impact Summary

Environmental Parameters	Impact Assessment during Different Phases	
	Construction	Operational
A: Physical		
Land Resources		
Soil Erosion and Contamination	0	0
Transportation	-1t	-1 t
Solid Waste and By-Products	-1t	+1p
Land Use	-1p	+1p
Air Resources		
Noise Pollution	-1t	-1p
Air Emission	-2t	0
Dust	-1t	-1t
Water Resources		
Ground Water	-1t	-1p
Surface Water	NA	NA
Wastewater	-1t	-1p
B : Ecological		
Flora		
Tree Cutting	N/A	N/A
Fauna		
Terrestrial Fauna	N/A	N/A
C: Socio-Economic		
Employment Opportunities	+1t	+1p
Land Value Appreciation	N/A	N/A
D: Hazards		
Physical Hazards	-1t	-1p
Health and Safety	-1t	-1p

Legends: 1= Low; 2= Medium; 3= High; 4= Extremely High; NA= Not Applicable; t= Temporary; p= Permanent; app= Applicable; 0= Negligible

6.7 IMPACTS DUE TO PROJECT LOCATION

The said project site is located in designated industrial zone. The project site is owned by the company. Further, the project site is devoid of any human habitation hence evacuation of the project-affected persons will not be involved in this project. Thus, no resettlement and rehabilitation issues will be involved in the said project. This project will be developed while undertaking minimum cutting for making terraces for construction while making minimum modifications in the terrain conditions and implementing environmental measures.

The topsoil removed from the site will be restored in dumps during construction period and in the post construction phase. The top soil will be spread on the unbuilt area of the plot and tree plantations and green belt development will be taken up. As the top soil removed from the site will be reused for the growth of plants, no adverse impact will be envisaged due to removal of topsoil from the site.

6.8 DESIGN PHASE

In general, the design of the said project optimized the use of best available technology in order to prevent or minimize potentially significant environmental impacts associated with the project as well as to ensure high level business and environmental performances. In pre-construction / design phase, a management system will be provided at design level for the reduction of impacts.

6.9 IMPACTS ASSOCIATED WITH CONSTRUCTION PHASE

Sr. No	Aspect	Impacts	Mitigation Measures
1	Economy Improvement	During construction phase, employment opportunities for local people will be generated.	No specified mitigation measure is required.

		Raw material will be obtained locally increasing the economic value of area.	
2	Air Quality	During construction phase, suspended particulate matter are the main pollutants during the site development activities such as leveling of land, filling activities, transportation of construction material to the project site from various places. Fugitive emissions will be observed due to vehicular movement. But it will be negligible or temporary phenomenon.	Dust emissions will be minimized through strict enforcement of onsite speed controls. The routes will be sprinkled with water regularly to reduce the amount of dust generated by construction vehicles. Construction machinery will be kept away from the walkways. All the vehicles carrying the construction material will be fully covered and well maintained. The inspection of the vehicles and construction machinery will be done on regular basis. All vehicles and construction machinery will be properly tuned, serviced and monitored on regular basis.
3	Water Quality	During construction phase, water will be required for construction of structures, sprinkling on roads for	During this phase, water conservation practices will be given proper consideration.

		dust suppression, domestic uses of construction workers	
4	Relocation of Utilities	The project site is already in designated industrial area. The construction will not relocate the existing public utilities.	No mitigation measure is required.
5	Solid Waste Generation	During excavation of the site for foundation works and landscaping, solid waste will be generated. The waste consisted of metal cuttings, rejected materials, surplus material, paper bags, cement bags, empty cartons and broken glass pieces.	Recyclable material will be separated at source. The cement bags and other such items will be handed over to approve contractors on weekly basis. Other waste will be accumulated at waste area and will be taken by the municipal waste management company.
6	Noise Pollution	During construction phase, the major sources of noise will be due to operation of construction equipment. The anticipated noise will be mostly confined to the facility itself.	Several mitigation measures will be considered. For this purpose, most of the construction works will be done in day time. The advance machinery will be recommended to lower the noise and work efficiency. Proper PPEs (ears plugs and ears muffles) will be given to workers

			so that exposure to noise will be less.
7	Ecology	The project site is located in industrial area. It was devoid of thick forest and vegetation.	After the construction, tree plantation will be done to act as pollution barrier as well as to enhance the aesthetic beauty of the area.
8	Worker's Health, Safety and Environment	The construction activities had the potential to pose negative impact on the health and safety of workers in case of unfavorable working conditions.	The contractor ensured that the workers and labors will be trained in safety procedures for all relevant aspects of the construction. Workers will be provided with proper safety equipment which were required on the basis of nature of the work. First aid kits will be kept available on the site to ensure safe working environment for the labors and workers. As per the requirement warning signs will be displayed in local language. Proper fencing will be done around the site.

			A safety officer will be appointed at the site for risk assessment and ensure the safety of workers.

6.10 IMPACTS ASSOCIATED WITH OPERATION PHASE

During the operation phase different type of the process will be done. The possible impacts of the process of printing is being evaluated as down here.

In this section, the combined environmental and socio-economic impacts associated with the said process of this project in operation phase are discussed. The impacts that are discussed are as follows:

Environmental Impacts

- Air emissions
- Noise
- Traffic
- Solid waste and by-products
- Wastewater
- Resource Consumption
- Abnormal conditions
- Occupational Health and Safety

Socioeconomic Impacts

- Employment Opportunity
- Community Development

6.11 ENVIRONMENTAL IMPACTS

6.11.1 AIR EMISSIONS

POTENTIAL IMPACTS

Air emissions from the project are relatively small and specified. Only source for air emissions are from standby diesel generators and boiler. The emissions from standby generator will be less in concentration. The emission levels depend on the type and quality of fuel and the manner in which it is burnt.

MITIGATION MEASURES

The following mitigation measures will be implemented. The proposed mitigation measures to reduce the impacts on air quality during the operation activities are:

- Generator will be equipped with air emission control technology.
- Biomass will be used as fuel for the boiler
- As per PEQS the values from boiler will be regularly checked through EPA certified laboratory and maintained.
- The inspection and the maintenance of the generator will be done on regular basis when in use.
- Plantation of indigenous trees within the premises and along the boundary.

RESIDUAL IMPACT

If proper mitigation measures are effectively implemented, the residual impact of the proposed activities on the area's air quality is expected to be low in terms of significance, reversible.

6.11.2 NOISE

POTENTIAL IMPACTS

The main sources of pollution from noise are during raw material and finished good loading and unloading, vehicle movements, operation of machines.

MITIGATION MEASURES

The following mitigation measures will be undertaken in order to further reduce the noise levels:

- Noise barriers should be implanted
- Noise area will not be open site. The source of noise will be in closed and covered place. Where the OSH standard will be applied.
- The repairing and the small source of noise will be removed if it will possible.
- PPEs will be provided to workers
- Proper tree plantation will be done
- Noise monitoring will be carried out periodically.

RESIDUAL IMPACTS

Implementation of the mitigation measures proposed above will result in negligible to no residual impact due to unit noise on the surrounding environment.

6.11.3 TRAFFIC

The operational phase of the unit will result in increased traffic. However, the impact will be minimal. Vehicles will be well maintained to prevent unnecessary exhaust emissions and drivers will be appropriately trained.

MITIGATION MEASURES

The following mitigation measure will be implemented.

- Nighttime driving of project vehicles will be limited where possible.
- Vehicles will remain confined to defined access.
- Speed limits will be maintained.
- Road signage relevant to the project traffic will be placed, where necessary.
- All vehicle drivers will be trained in community safety aspects. Drivers will be trained in responsible and safe driving practices; safe speed limits for vehicles will be followed.

6.11.4 **SOLID WASTE**

Solid waste generated will be generated from process and organic and domestic solid waste from the canteen. Most of the generated waste will be recyclable. The waste from process may include packaging waste, paper discarded inks and tapes etc. All the waste will be segregated from its production line. The generated domestic solid waste will be handled as per area practices.

MITIGATION MEASURES

The following mitigation measures will be implemented:

- There will be separated bins for segregation of different type of waste.
- The recyclable waste will be maximumly utilized.
- Packaging material waste e.g. pails, containers, cartons will also be disposed-off to certified waste handlers.
- Records of generated waste should be maintained.
- All non-hazardous waste that can be recycled or reused will be handed over to the contractors.
- Training will be provided to personnel for identification, segregation and management of waste.
- All containers of waste will be labeled properly.

RESIDUAL IMPACTS

Proper implementation of the mitigation measures will minimize the residual impact from waste. Monitoring and inspection will be undertaken to ensure the implementation of mitigation measures.

6.11.5 **WASTEWATER**

Wastewater will be produced from domestic uses and a little amount from process.

Mitigation Measures

- Wastewater will be disposed off in Sewerage Lines of Sundar Industrial Estate, Allotment letter is obtained.
- 1 % of wastewater will be generated from process only.
- The wastewater will be treated through primary treatment before final disposal.
- Monitoring of wastewater will be conducted through EPA certified lab.
- Domestic wastewater will be treated primarily.

RESIDUAL IMPACTS

Implementation of the proposed mitigation measures and regular monitoring is not likely to leave any significant impact of the waste water from the unit.

6.11.6 OCCUPATIONAL HEALTH AND SAFETY

This section discusses the occupational health and safety impacts of the operation of said unit. Physical hazards may include exposure to same-level fall hazards due to slippery conditions.

MITIGATION MEASURES

In order to reduce the physical hazards and other health and safety issues that may be encountered at workplace, following will be followed.

- Proper training will be provided for the proper usage of machineries and personal protective equipment (PPE).
- It will be ensured that the individual who has received the correct training is operating a particular machine.
- Site supervisor or health and safety officer should be present on site
- Emergency response plans will be remained active.
- Monitoring cameras and sensors will be implanted at the work site

- Warning signs and HSE&S notices will be provided to remind people of no-go distances and speed limits, and also truck loading procedures
- Timely maintenance and repair of electrical equipment will be conducted.
- Implementation of work rotations, provision of regular work breaks.
- At workplace, first aid facilities will be maintained at readily accessible places.

6.12 SOCIOECONOMIC IMPACTS

A summary of potential socio-economic impacts of the project is presented in Table below.

Table 6-4: Potential Socioeconomic impacts of the project

Impact	Beneficial	Adverse
Economic	• Employment generation • Procurement of equipment and services • Local authority business tax / rates revenue • Increase in property value	Negative economic Impacts are not anticipated
Social	• Indirect beneficial community impacts from employment • Provision of training to employees and workers	Risks of occupational and environmental health issues.

By implementing the following mitigation measures, impact to community can be minimized.

- All vehicle drivers will be trained in community safety aspects.
- The company will maintain a social complaint register at the site to document all complaints received from local communities. The register will also record the measures taken to mitigate these concerns.
- Maximum number of unskilled and semi-skilled jobs will be reserved for the local communities.

6.12.1 EMPLOYMENT OPPORTUNITIES

The project is expected to have positive impact on economic condition of locals. Employment opportunities will be generated due to project activities.

Similarly, the operation of the project will create far greater number of indirect income resources for example income resource for transporters for the transportation of the raw materials, procurement of required goods from local market etc.

Overall, the project will have a positive impact on the employment opportunities of Pakistan.

6.13 POTENTIAL ENVIRONMENTAL ENHANCEMENT MEASURES

6.13.1 GREENBELT DEVELOPMENT

Apart from functioning as a pollutant sink, green belts provide other benefits like:

- Green belt helps in noise abatement for the surrounding area. Thus, it is recommended as noise barriers.
- Green belt will help to regulate the air quality
- Green belt also absolves extra heat help to maintain the change of enthalpy
- Green belt will provide natural refreshment to workers
- Green belts increase the aesthetic value of the site.

M/s G & Z Paper (Pvt) Ltd will design a proper landscaping plan, the plants/ trees will be planted at the boundary walls of unit, as well as green belt will be maintained.

CHAPTER NO 7
ENVIRONMENT MANAGEMENT AND MONITORING PLANS

CHAPTER 7: ENVIRONMENTAL MANGEMENT AND MONITORING PLANS

7.1 GENERAL

This EIA provides the Environmental Management Plan (EMP) of the project to keep it environment benign as well as the monitoring plan to ensure the compliance of the established EMP. Outline and key features of the EMP for construction and operations phase is presented in sub-sections below. 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. This section also underlies 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.

7.2 OBJECTIVES OF ENVIRONMENTAL MANAGEMENT PLAN

The primary objectives of the EMP are to:

- Facilitate the implementation of the mitigation measures identified
- 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
- To apply the rules and regulation of the Punjab Environmental laws and international standards
- Making of environmental managemental polices
- Reviewing, regulating and improving of environmental policies on regular basis.

7.3 MANAGEMENT APPROACH

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

Proponent*:* The proponent will undertake overall responsibility for compliance with the EMP.

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.

7.4 COMPONENTS OF THE EMP

The EMP consists of the following:

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

7.5 ENVIRONMENT MANAGEMENT PLAN

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

Table 7-1: Environmental Management Plan

Objective	Management Action	Responsibility	Time framework	Residual impact
Construction phase				
Employment Opportunities				
To promote the employment of local persons	Recruitment of local workers will be undertaken without discrimination and in accordance with company recruitment policy by contractors involved in construction	Contractor	On commencement of construction activities	Unemployed people of area will get job opportunities and their standard of living improved
To promote the use of local service providers	Local procurement of goods and services will be undertaken wherever possible and cost effective and where practicable to the project	Contractor	On commencement of construction activities	Indirect job opportunities
Safety during construction				
To ensure safety on construction site	• Safety signage will be put in relevant places within the construction site • Site Health and Safety officer will be present	Contractor/Environmental manager/HSE manager	On commencement of construction activities	Safety of workers will be ensured by implementing proposed mitigation measures.

	• Construction drivers will be subjected to public safety awareness • Reckless driving by construction workers will be prohibited and monitored • Workers will be given PPEs such as; helmets, mask, ear-plugs/muffs, safety boots, etc. and its use will be strictly enforced • Workers will be trained on the regular basis regarding personal safety • Incidents will be reported directly to the concerned authority			
Construction waste management				
To prevent the contamination of soils and water resources due to inappropriate management and disposal of waste	• The construction site will have litter bins for waste collection • Recycling or reuse of waste wherever possible. • Application of a good strategy to collect, remove and safely dispose of	Contractor	Throughout construction stage	Waste was disposed of/reused/ recycle or resale as per practices of area.

	waste on daily basis to ensure a clean environment in the factory site • Integrated waste management system will be adopted for the proper management of the waste at site • At the end of the construction phase, left-over waste will be removed by using the standard waste management procedures • All the idle machinery and equipment will be immediately removed from the site • Scrap and the debris will be removed from the site at the end of the construction stage after appropriate segregation of the material • All the domestic waste produce by the worker will be given to the municipal waste management company			
Pollution control management				

To contain spillages	• Proper maintenance of construction vehicles and equipment will be undertaken • Appropriate environmental security measures including shovels and plastic bags etc will be provided to prevent accidental release to ground. • Appropriate procedures and protocols will be established and monitored for materials transport and handling whilst on the site. • Emergency response plan will be developed for any incident.	Contractor	On-site establishment	Potential for accidental release of materials during transport and handling on the site should be minimized.
To manage sewage	Portable toilets will be provided at site.	Contractor	On commencement of construction	Portable toilets will be cleaned properly and regularly
Protection of biodiversity				
To avoid unnecessary disturbance of and	• Minimize clearing of vegetation during construction	Contactor	Throughout construction phase	Although the land is industrial in nature but vegetation loss cannot be

quick recovery of biodiversity in the plant site (if applicable)	• Surface soil excavated during construction to be placed back on the sub-soil to fast vegetation recovery • Prepare and implement an appropriate landscaping programme to increase aesthetics of area • The flora of the site will be restored at the end of the construction phase by landscaping and planting native vegetation • Defining the route for vehicles and machinery transport, defining the work area, the pathway for the worker area will also be defined and policy will form for the minimum use of outer land during construction.			avoided, but successful restoration, improvement and long-term management of the surrounding areas and maintenance of planted trees will be provided
Air quality & dust management				
To minimize the dust entrainment	• Regular surface wetting will be implemented on dusty sections in the factory construction site	Contractor	On commencement of construction activities	Dust propagation will be limited to construction area and will not influence local

during construction	• Strict on-site speed controls will be enforced for construction vehicles • All trucks hauling soil, sand and other loose materials will be covered • No excavation activity will be carried out during windy days • The watering of the route will be done on regular basis • Specified routes will also help to overcome the dust to evolve. • Fuel-efficient and well-maintained haulage trucks will be employed to minimize exhaust emissions • Construction workers will be sensitized on measures to reduce air pollution			community. However, workers were supplied with dust masks especially on dry days.
Noise				
To minimize disturbance due to noise	• Loading and unloading of materials will be done carefully to reduce noise disturbances to surrounding households	Contractor	On commencement of construction activities	within PEQs

	• Residences are at a safe distance from site so no disturbance will be envisaged. • Drivers will be instructed to avoid unnecessary gunning of vehicles, hooting and buzzing. • Regular maintenance of the machinery will be done to reduce the noise • Vehicles will be tuned on regular basis • The inspection of the vehicles will be done by health and safety officer on regular interval			
Occupational health & safety				
To ensure healthy and Secure/safe environment in the construction site for all workers	• Management will ensure that fire extinguishers should be located in strategic and visible places • Health and Safety data sheet will be design and formed by Safety officer.	Contractor	Throughout construction phase	Record of all incidents will be maintained and reported to HSE manager.

	• All vehicles and construction equipment will be under control of competent personnel • Inspection of material and harmonization to the occupational health and safety standards. • Adequate security for workers will be provided during construction • Sensitize workers to operate in teams			
Operation phase				
Wastewater management				
Degradation of surface waters quality due to process water and sewage direct disposal	• Domestic wastewater will be treated primary treatment. • Wastewater will be disposed off in Sewerage Lines of Sundar Industrial Estate. Allotment letter is obtained. • Process wastewater which is 1 % in total quantity will be treated primarily. • Regular analysis of wastewater from EPA certified lab will be conducted.	G & Z Paper (Pvt) Ltd	Throughout project life cycle	None

Air quality management				
Particulate emissions and stack emissions	• Generators will be equipped with air emission control technology. • The inspection and the maintenance of the generator will be done on regular basis when in use. • The fuel in the boiler will be biomass so there will be low likelihood of toxic gases into the air. • Cyclone fly ash separator will also be installed on the boiler. • Monitoring as per PEQS will be conducted for record maintenance.	M/S G & Z Paper (Pvt) Ltd	Throughout operation phase	Local air quality will be virtually unaffected and will be based on PEQs
Noise & vibration				
To minimize disturbance of communities due to noise	• Noise barriers should be implanted • Noise area will not be open site. The source of noise will be in closed and covered place. Where the OSH standard will be applied. • PPEs will be provided to workers	M/S G & Z Paper (Pvt) Ltd	Throughout project life cycle	Noise level will be based on PEQs

	• Proper tree plantation has been done • Noise monitoring will be carried out periodically.			
Traffic & transport				
Increased heavy vehicles traffic both locally and nationally.	• Nighttime driving of project vehicles will be limited where possible. • Speed limits will be maintained. • Road signage relevant to the project traffic will be placed, where necessary. • All vehicle drivers will be trained in community safety aspects. Drivers will be trained in responsible and safe driving practices; safe speed limits for vehicles will be followed.	Management of M/S G & Z Paper (Pvt) Ltd	Throughout project operation	The traffic has the potential to contribute to congestion and lead to complaints due to noise/vibration nuisance on a local basis. However, the study indicates that there will not be a significant impact.
HSE				
To minimize loss work injury/hazards/incidents/accidents	• Proper training will be provided for the proper usage of machineries and personal protective equipment (PPE).	Environmental manager/HSE of M/S G & Z Paper (Pvt) Ltd	Throughout life cycle of project	Potential of injuries will be minimized

	• It will be ensured that the individual who has received the correct training is operating a particular machine. • Site supervisor or health and safety officer should be present on site • Emergency response plans will be remained active. • Timely maintenance and repair of electrical equipment will be conducted. • Implementation of work rotations, provision of regular work breaks. • At workplace, first aid facilities will be maintained at readily accessible places.			
First aid				
To ensure safety and health	• First aid box will be available at the site • First aid training will be given to the employees on the regular basis • Numbers of all the concerned/authorized persons that will	Environmental manager/HSE of M/S G & Z Paper (Pvt) Ltd	Throughout life cycle of project	None

	be contacted in the case of emergency will be displayed on-site			
Fire hazard				
To prevent any disaster	• Firefighting equipment including DCP type fire extinguisher, sand buckets, sand drums with spade and hose pipe cabinet will be installed inside the plant • All the equipment will be placed at strategic locations where the risk of out-burst of the fire is high. List of fire posts is annexed. • Smoking will not be permitted in the vicinity of the plant • Regular site inspection will be done to eliminate all the chances of the hazards	Environmental manager/HSE	Throughout life cycle of project	Potential of disaster will be minimized by suggested mitigation measures implementation
Employment				
To provide job opportunities and helping in	• Employment opportunities for the un-skilled workers will therefore increase which will enhance the positive benefits	M/S G & Z Paper (Pvt) Ltd	During construction and operation phase	Direct and indirect jobs

improving living standard of people	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 labour and after completion of construction phase serve as a permanent business opportunity.			

7.6 ENVIRONMENTAL MONITORING PLAN

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

Table 7-2: Environmental Monitoring Plan

Env. Components	Project Stage	Parameters	Instrument	Standards	Monitoring			Institutional Responsibility
					Location	Frequency	Duration	
Air	Construction	PM_{10}, SO_2, NO_2, CO, SPM ,O_3	Air Quality Monitors/Gadgets	PEQS	Project site	Twice during construction	As per approved testing method	Contractor through approved monitoring lab
	Operation	Stack emissions	Air Quality Monitors/Gadgets	PEQs	stack	As per SMART Rules, 2000.	As per approved testing method	Through approved third party/monitoring lab

Noise Levels	Construction	Noise levels on dB(A) scale	Digital Sound Meter	PEQs	Project site	Twice during construction	Reading to be taken at 15 seconds interval for 15 minutes every hour and then averaged	Contractor through approved monitoring lab
	Operation	Noise levels on dB(A) scale	Digital Sound Meter	PEQs	Project site	As per SMART Rules, 2000	Reading to be taken at 15 seconds interval for 15 minutes every hour and then averaged	Through approved third party/monitoring lab
Wastewater	Operation	BOD, COD, TSS etc	Through approved equipments	PEQs	Outlet	As per SMART Rules, 2000	As per approved testing method	Through approved third party/monitoring lab

7.7 INSTITUTIONAL CAPACITY OF THE UNIT

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

7.7.1 Primary Responsibilities

The primary responsibility for implementing different aspects of the EMP within the company lies with the concerned departments of M/S G & Z Paper (Pvt) Ltd.

7.7.2 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.

7.7.3 Supervision & Monitoring

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

7.7.4 Communications & Documentation

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

7.7.4.1 Meetings

As environment is multidisciplinary subject with environmentalist having a dynamic role therefore In-charge environment would be considered as integral part in both constructional and operational team.

7.7.4.2 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.

7.8 ENVIRONMENTAL TRAINING

Environmental training will help to ensure that the requirements of the EIA and EMP are clearly understood and followed by all project personnel in the course of the project.

7.9 EQUIPMENT MAINTENANCE DETAILS

The project is about printing industry namely "M/S G & Z Paper (Pvt) Ltd". Following is the maintenance details for the machines and equipments:

Task	Weekly	Monthly	Semi-Annually	Annually
Visual Inspection	✓			
Testing and Inspection		✓		
Maintenance of Machines		✓		
Fire Mains and Nozzles		✓		
Containers/Cylinders		✓		
Control and Section Valves		✓		

7.10 ENVIRONMENTAL BUDGET

Approximately PKR 2 million budget will be reserved for tree plantation, solid waste management, wastewater management and environmental monitoring. Monitoring tests for ambient air quality, noise and groundwater quality will also be conducted.

CHAPTER NO 8
CONCLUSION AND RECOMMENDATIONS

CHAPTER 8: CONCLUSION AND RECOMMENDATIONS

8.1 CONCLUSION

The report presents Environmental Impact Assessment of the said unit. EIA of said 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 will strengthened the environment and promote sustainable development.

Based on overall assessment of the environmental impact of the project, it is concluded that the economic benefit from the project is not at the cost of environment. From the historical records and vast experience in sustainable development keeping environment as integral part of manufacturing system, G & Z Paper (Pvt) Ltd is worthy of Environmental approval. Further the project is not likely to cause any significant adverse impact on the physical and biological environment but positive impact on social development and economic prosperity 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.

8.2 RECOMMENDATIONS

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

- Implementation of EMP must be given top priority.

- Train workers to use PPEs
- Advise workers to follow SOPs.
- Equipment maintenance and efficiency must be checked.
- No compromise on public health and environment should be allowed.
- Waste minimization practices should be employed and workers should be encouraged to adopt such methods.
- Wages should be distributed on time.
- Small waste storage bins should be installed at different corner for proper waste collection and discharge.
- The proposed Environmental Management & Monitoring Plan should be implemented.
- The construction and installation should be completed in guidelines of accorded Environmental Approval.

ANNEXURE I
CNIC OF PROPONENT

ANNEXURE II
ALLOTMENT LETTER

Board Of Management
Sundar Industrial Estate

TRANSFER LETTER

BOM-SIE/CS/20-10
October 8, 2020

M/s. G & Z Paper (Pvt.) Ltd,
2/4, Shabbir Road,
Lahore Cantt.

Subject: **Transfer Letter of Plot No. 147, Sundar Industrial Estate, Raiwind Road, Lahore.**

Dear Sir,

Reference your application dated: **September 18, 2020, Plot No. 147** measuring **10,967.75 Sq. M** situated at Sundar Industrial Estate, Sundar Raiwind Road, Lahore has now been transferred in your name on the same terms and conditions as it was held by the original Allottee Company/ Firm/ Individual.

You will be required to visit our office within a week of the receipt of this Transfer Letter for physical possession of the plot and execution of agreement to sell.

The following changes have been effected:-

Change in Allottee/ Owner Name from

Dr. Anwar Muhammad Randhawa, Dr. Muhammad Arshad, Dr. Hafiz Abdul Qayyum, Dr. Muhamamd Asim Khan,

To

M/s. G & Z Paper (Pvt.) Ltd,

Secretary BOM-SIE

A copy forwarded to previous allottees,

Secretary BOM-SIE

Note: This transfer letter is issued with the approval of Competent Authority of **BOM- SIE** vide approval dated: **October** 9, **2020.**

Board Of Management
Sundar Industrial Estate

BOM/SIE/1318
October 16, 2020

M/s. G & Z Paper (Pvt.) Ltd,
2/4, Shabbir Road,
Lahore Cantt.

SUBJECT: POSSESSION LETTER OF PLOT NUMBER 147

Dear Sir,

This is with reference to your request dated: September 25, 2020 regarding subject matter. Please contact the Site Engineer of Sundar Industrial Estate in connection for possession of the Plot No. 147 SIE.

Thanking you,

Yours truly,
For Board of Management
Sundar Industrial Estate

Secretary
BOM-SIE

A copy is forwarded to Mr. Kashif Tanveer, Site Engineer (0300-4527932), with the request to please hand over the possession of Plot No. 147 SIE to its Allottee M/s. G & Z Paper (Pvt.) Ltd. The attached possession slip may please be returned after doing the needful.

Note.
This Possession Letter is issued with the approval of Competent Authority of BOM-SIE vide approval dated: October 16, 2020.

Please do not proceed with the excavation of boundary wall without supervision of the site representative. Any damage done to the utilities without supervision will be borne by you.

Gate No.2 Sundar, Raiwind Road, Lahore,
Phone: 042-35297291-3, Fax: 042-35297080
Email:info@sie.com.pk, Web: www.sie.com.pk

POSSESSION SLIP

Certify that I have taken over possession of **Plot No. 147 SIE measuring** 10,967.75 Sq. M from the site Engineer of the Sundar Industrial Estate today the 2/12/020.

The dimension of the plot is :- The drawing from M/s NESPAK is enclosed. Utility i.e Water supply, sewage, gas, electricity and gate location is guided for Red zone free BOT wall

Signature of the Allottee ______________

Name of the Allottee ALI ANWAR.

Site Engineer

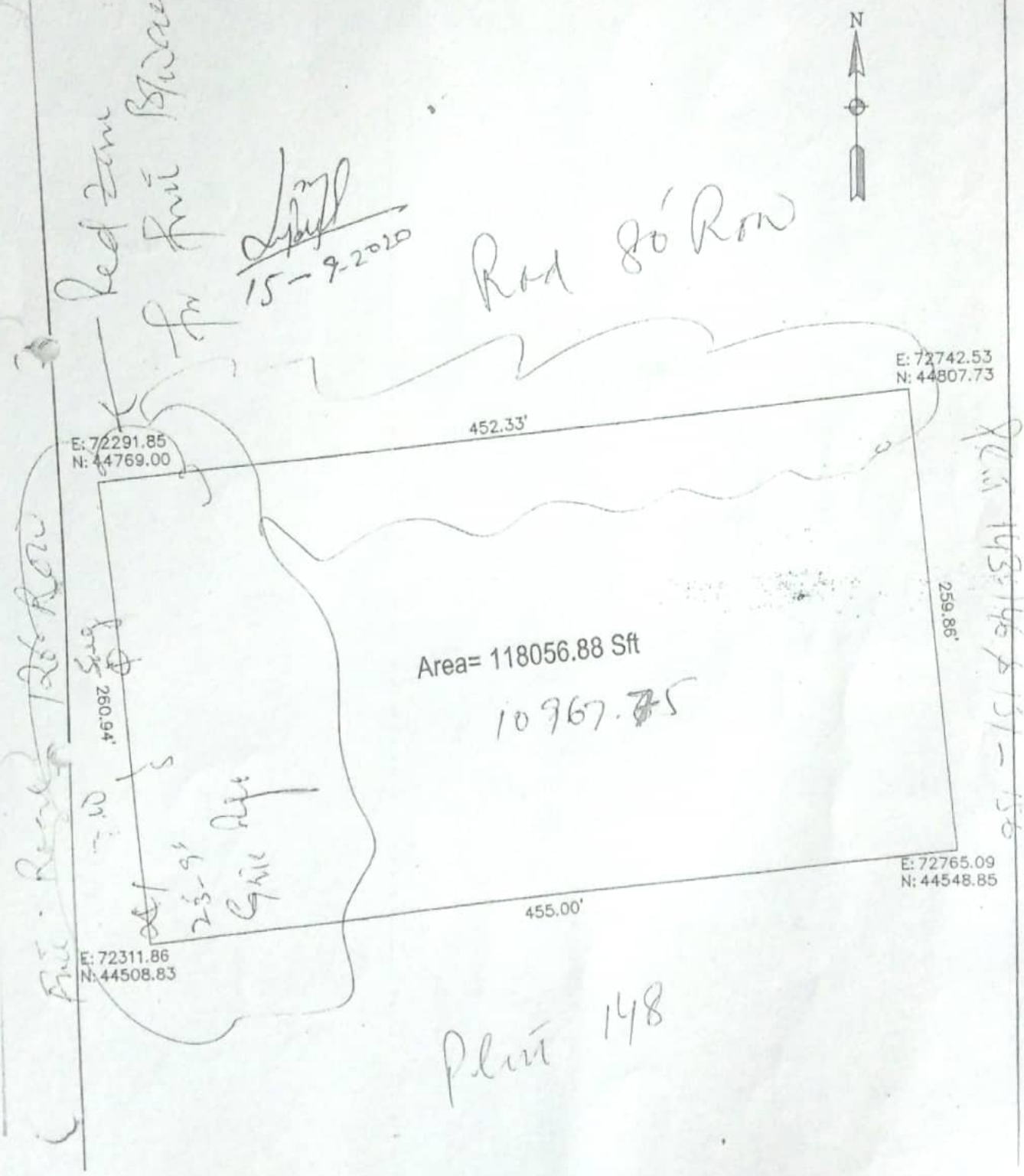
7/12/020

Estate Engineer SIE

ANNEXURE III
SITE LAYOUT PLAN

SUNDER INDUSTRIAL ESTATE

LAYOUT OF PLOT NO. 147



ANNEXURE IV

BASELINE ENVIRONMENTAL MONITORING REPORTS

ENVIRONMENTAL PROTECTION AGENCY
GOVERNMENT OF THE PUNJAB
National Hockey Stadium, Gate No. 08
Gaddafi Stadium Complex, Lahore

Validation # 1721
Dated # 01-11-2024

Validation for Stack & Ambient Monitoring / Sampling

Emission Monitoring under CTM-34 or OTM-39				
Facility Name & Address Phone	G Eq Z Paper (Pvt.) Ltd. Plot no. 147, Sundar Industrial Estate, Lahore	No of Stacks /Sampling Point	AA = 01	
Industry Category	Baseline.			
Analyzer Model & Make	AQMS (Horiba)			
Average stack emission Values of CO, NOx (in mg/nM3)				
Excess Air / Excess Oxygen (%age):-				
Analyzer exposed for Ramp-Up phase to the sample gas for 5 minutes		Yes	NO	NA
Analyzer flow rate and EC temperature monitored during calibration and testing		Yes	No	NA
Test Data Phase of sample gas recorded with 15 second interval		Yes	No	NA
All key requirements to ensure QA/QC complied for said EPA approved Method		Yes	No	NA
Particulate Matter (PM) Monitoring / Sampling under USEPA Method 5 / 17				
Model & Make of Iso-kinetic PM Assembly				
The PM sampling train is complete as per Method 5 & 17		Yes	No	NA
Leak Test performed prior to sampling		Yes	No	NA
Field data Sheet for PM Sampling filled during PM sampling		Yes	No	NA
Data for determining of "K" factor & DGM "Y" Factor filled during sampling		Yes	No	NA
All method key requirements during sampling were compiled to ensure QA/QC		Yes	No	NA
Filter of Particulate matter is suitable for metal Testing		Yes	No	NA
SOx sampling as per Method 8 (Thorin Indicator Method)				
The right absorbent solution are available for SOx Sampling		Yes	No	NA
The equipment is capable to maintain flow rate @ 2.0LPM or as per method 8 requirement		Yes	No	NA
Sampling for SOx is performed as per method		Yes	No	NA
Ambient Air Quality Monitoring by Automatic Monitors for CO, O3, SO2, NOx, PM2.5 & PM10				AA = 01
In case of continuous monitoring at a site, One Point QC Check Single analyzer & Zero/span check is performed every 14 days.		Yes	No	NA
The CE of NOx analyzer is ensured to be maintained within 96% - 104.1%		Yes	No	NA
Zero/span check is performed prior to starting ambient monitoring		Yes	No	NA
All key requirements for Critical & Operational Criteria for ambient air monitoring by automatic monitors were compiled during monitoring		Yes	No	NA
The measuring techniques of monitors comply PEQS		Yes	No	NA
Ambient Air Sampling of SPM, PM10, Pb by High Volume Sampler (AMS)				
In case of Sampling for SPM through samplers, the flow rate of sampler comply PEQS (1.1m3/min).		Yes	No	NA
Calibration of Sampler performed prior to sampling		Yes	No	NA
Vehicular Emissions & Noise Measurement				
Sampling of Vehicle emissions and noise measurement have been performed as per method and SOPs		Yes	No	NA

Remarks (if Any):-

Signature

Dated 21-22 oct, 2024

Signature Muhammad Nasir (Deputy Analyst)

Green Crescent Environmental Consultants Ltd. PAKISTAN

ENVIRONMENTAL PROTECTION AGENCY
GOVERNMENT OF THE PUNJAB
National Hockey Stadium, Gate No. 08
Gaddafi Stadium Complex, Lahore

Validation # 1721
Dated = 01-11-2024

Validation for Wastewater & Drinking Water

Facility /Project Name & Address Phone	Gee Z Paper (Pvt.) Ltd. Plot no. 147, Sundar Industrial Estate, Lahore	**Sampling Point**	GW=01

Waste Water (**WW**) Treatment facility — Primary / Secondary / Tertiary / NA

Drinking Water (**W**) Treatment Facility

Total WW collected Sample .....

Total Collected Drinking water samples.. GW=01

Sample Tag for testing parameter is assigned on sample container	Yes ✓	NO	NA
Sample is preserved properly for each testing parameter	Yes ✓	NO	NA
Sample size is adequate for testing the target parameters	Yes ✓	NO	NA
Wastewater Flow Measurement performed to ensure sample representativeness	Yes ✓	NO	NA

No. of Waste Water outlets	Waste Water Flow m^3/hr from each outlet (**Optional**)	Water intake m^3/hr (**Optional**)	Water Mass balance complied during sampling (**Optional**)	Sample Type
—	—	—	Yes No	Ground Water Grab ✓ Composite

Parameter	Matrix W	Matrix WW	Container	Sample Size	Preservation	Yes	NO	NA
Coliform, Total or Fecal	✓		Sterile Container	100 mL	Refrigerate 6 C	✓		
Coliform, Total or Fecal, Chlorinated Water	✓		Sterile Container	100 mL	0.008% Thiosulphate & cooled 6 C	✓		
Color, Turbidity	✓		P,G	500 mL	Cool 6 C	✓		
Hardness, Total	✓		P,G	500ml	HNO3 to pH<2	✓		
Nitrogen, Nitrate + Nitrite , Phenolic Compounds, Oil & Grease, COD, NH3	✓		P,G	2000 mL	H2SO4 to pH < 2, Cool 6C	✓		
Metals, General	✓		P,G Rinsed 1.1 HNO3	500 mL	HNO3 to pH < 2	✓		
Cyanide, Total	✓		P,G	500 mL	NaOH to pH > 12, Cool 6C	✓		
Pesticides, General	✗		Glass	1 Liter	Cool 6 C	✓		

Field Parameters*

Field parameter		pH meter, Model Make	Measurement Method	Calibrated in Field	Measured value
pH		Lovibond	APHA-4500+B	Yes ✓ NO	
Temp		Digital Thermometer			
Cl					

*** Field testing parameters only be validated by RAs, ROs, DD (Labs)**

Remarks for Sample Quality (if Any):-

Signature **Dated** 22-Oct-2024

Signature Muhammad Tahir (Deputy Analyst)

Green Environmental Consultants Ltd. ★ PAKISTAN ★

Environment Protection Agency Punjab Lahore.

Figure 1: Ground Water Sampling

Figure 2: Ambient Air Monitoring

Green Crescent
Environmental Consultants Pvt. Ltd.

Sr. No# 24A/ 17939

Monitoring & Test Report

- Ground Water
- Ambient Air
- Meteorological Data
- Noise Monitoring

G & Z PAPER (PVT) LTD

25th Oct. 2024

Job Reference No.: GCEC-PK-LHR-163/2024

Pakistan Office: House No. 368-B , Block Canal View Housing Society, Lahore. Pakistan.
0320 4143519, 0320 4143318
042 35962884-85 0320 4143318
manager.operations@gcee.ae www.gcee.pk

Client Detail:	
Name of Contact Person:	-
Designation:	-
Contact Number:	-
Email:	-
Address:	Plot no. 147, Sundar Industrial Estate, Lahore

GCEC Details:	
Director:	Mr. Mian Khurram Usman
Telephone:	+92 42 35962885
Fax:	+92 42 35962884
Email:	manager.operations@gcee.ae
Address	House No. 368-B Block B, Canal View, Lahore

Signatories:

Green Crescent Environmental Consultants Pvt Ltd. ★ PAKISTAN ★

Pakistan Office: House No. 368-B , Block Canal View Housing Society, Lahore. Pakistan.
0320 4143519, 0320 4143318
042 35962884-85 0320 4143318
manager.operations@gcee.ae www.gcee.pk

Green Crescent
Environmental Consultants Pvt. Ltd.

Sr. No# 24A/ 17941

CHEMICAL ANALYSIS TEST REPORT (GROUND WATER)

Sample Details			
Job Ref. No:	GCEC-PK-LHR-163/2024	Client Name:	G & Z Paper (Pvt) Ltd
Telephone No. :	-	Sample Matrix:	Ground Water Sample
Sample Date:	22-10-2024	Sampled By:	GCEC
Sample Receipt Date:	23-10-2024	Date of Completion of Analysis:	25-10-2024
Grab/Composite:	Grab Sampling	Address: Plot no. 147, Sundar Industrial Estate, Lahore	

Sample Identification	
01	Ground Water

Parameters	Analysis Method	Unit	LOR	Result 01	PEQS
PHYSICAL & CHEMICAL ANALYSIS					
pH**	APHA-4500H+ B	-	0.01	7.03	6.5-8.5
Odor	In-house	-	-	Odorless	Non-Objectionable
Taste	In-house	-	-	Sweet	Non-Objectionable
Color	APHA-2120 B/C	Pt/Co	1.0	<1.0	≤15 TCU
Turbidity**	APHA-2130 B	NTU	-	ND	<5 NTU
Total Hardness**	APHA-2340 B&C	mg/l	0.1	282.0	< 500 mg/l
Total Dissolved Solid (TDS)**	APHA-2540 C	mg/l	1.0	591.0	< 1000
Ammonia	APHA-4500-NH_3-B	mg/l	0.002	<0.002	-
Chloride**	APHA-4500 B	mg/l	0.24	37.21	< 250
Cyanide (CN)	APHA-4500CN E	mg/l	0.01	<0.01	≤ 0.05
Fluoride (F)**	APHA-4500F- D	mg/l	0.01	<0.01	≤ 1.5
Nitrite	APHA-4500NO2 B	mg/l	0.01	<0.01	≤ 3 (P)
Nitrate**	APHA-4500NO_3 C	mg/l	0.1	2.1	≤ 50
Phenolic Compound	APHA-5530 D	mg/l	0.01	<0.01	-
Residual Chlorine	APHA-4500Cl G	mg/l	0.1	<0.1	0.2-0.5
Aluminum (Al)	APHA-3111Al B	mg/l	0.028	<0.028	≤ 0.2
Cadmium**	APHA-3111 B	mg/l	0.0028	<0.0028	0.01
Copper**	APHA-3111 B	mg/l	0.0045	<0.0045	2
Chromium**	APHA-3111 B	mg/l	0.0054	<0.0054	≤ 0.05 (P)
Mercury	APHA-3112Hg B	mg/l	0.0008	<0.0008	≤ 0.001
Antimony (Sb)**	APHA-3111 B	mg/l	-	ND	≤ 0.005 (P)
Nickel**	APHA-3111 C	mg/l	0.008	<0.008	≤ 0.02
Zinc**	APHA-3111 B	mg/l	0.0033	<0.0033	5.0
Arsenic	APHA-3111As B	mg/l	0.01	<0.01	≤ 0.05 (P)
Barium	APHA-3111Ba B	mg/l	0.031	<0.031	0.7
Manganese**	APHA-3111 B	mg/l	0.0016	<0.0016	≤ 0.5
Iron**	APHA-3111 B	mg/l	0.1	<0.1	-
Boron	APHA-4500-B (C)	mg/l	0.1	<0.1	0.3
Lead**	APHA-3111 B	mg/l	0.013	<0.013	≤ 0.05
Selenium	APHA-3111Se B	mg/l	-	ND	0.01 (P)
MICROBIOLOGICAL ANALYSIS					
Total Coliforms	APHA:9222 B	CFU/100ml		Absent	0/100ml
Faecal Coliforms (Ecoli)	APHA:9222 D	CFU/100ml		Absent	0/100ml

Abbreviations:
ND: Not Detected **LOR:** Limit of Reporting **PEQS:** Punjab Environmental Quality Standards

Note:
** Uncertainty of all the parameters and laboratory conditions at the time of analysis will be provided as per client's requirement. The lab environmental conditions are maintained at 25±5C° and humidity at 50±20%.*

Disclaimer: *The results are solely of the sample provided. ** All starred parameters are PNAC accredited.*

Sample Analyzed By:

Analyst
Mr. Idrees Zaman

Name of Chief Analyst with Seal:

Mr. [illegible] Jassal

Green Crescent Environmental Consultants Pvt. Ltd. PAKISTAN

Pakistan Office. House No. 368-B , Block Canal View Housing Society, Lahore. Pakistan.
0320 4143519, 0320 4143318
042 35962884-85 0320 4143318
manager.operations@gcee.ae www.gcee.pk

Ambient Air Monitoring Location

CENTER OF SITE

(Lahore)

Pakistan Office: House No. 368-B , Block Canal View
Housing Society, Lahore. Pakistan.
0320 4143519, 0320 4143318
042 35962884-85 0320 4143318
manager.operations@gcee.ae www.gcee.pk

Ambient Air Quality Monitoring

Job Reference Number	GCEC-PK-LHR-163/2024
Monitoring Point	Center of Site
Date of Intervention	21-Oct-2024 to 22-Oct-2024
Monitoring Coordinates	31°17'23.4"N 74°10'27.0"E

Sr. #	Time	CO (mg/m^3)	NO ($\mu g/m^3$)	NO_2 ($\mu g/m^3$)	NO_x ($\mu g/m^3$)	SO_2 ($\mu g/m^3$)
1.	12:00	1.02	12.68	23.74	36.42	19.95
2.	13:00	1.06	13.31	24.16	37.47	18.76
3.	14:00	0.94	13.96	25.65	39.61	20.23
4.	15:00	1.13	14.21	25.12	39.33	20.56
5.	16:00	1.17	13.68	26.87	40.55	20.91
6.	17:00	1.26	14.37	27.78	42.15	22.07
7.	18:00	1.31	14.93	29.81	44.74	12.99
8.	19:00	1.29	15.61	29.09	44.7	15.26
9.	20:00	1.31	13.92	24.93	38.85	16.97
10.	21:00	1.28	13.26	26.31	39.57	15.33
11.	22:00	1.23	15.13	26.53	41.66	17.18
12.	23:00	1.19	14.68	26.98	41.66	15.57
13.	00:00	1.07	14.5	23.81	38.31	16.32
14.	01:00	1.04	15.66	26.41	42.07	16.72
15.	02:00	0.98	14.37	29.63	44	18.68
16.	03:00	0.97	14.78	27.96	42.74	16.51
17.	04:00	0.88	14.68	29.87	44.55	15.12
18.	05:00	0.91	15.51	27.01	42.52	15.78
19.	06:00	1.09	15.75	24.35	40.1	14.31
20.	07:00	1.21	16.05	25.67	41.72	15.36
21.	08:00	1.28	15.62	27.28	42.9	13.79
22.	09:00	1.05	15.79	28.06	43.85	14.51
23.	10:00	1.25	15.91	29.85	45.76	16.17
24.	11:00	1.29	13.09	30.96	44.05	16.92
Average Concentration		**1.13**	**14.64**	**26.99**	**41.64**	**16.92**

Monitoring Performed By:
Deputy Analyst
Muhammad Tahir

Name of Chief Analyst with Seal:
Engr. Usman Raza Jaswal

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Ambient Air Quality Monitoring

Job Reference Number	GCEC-PK-LHR-163/2024
Monitoring Point	Center of Site
Date of Intervention	21-Oct-2024 to 22-Oct-2024
Monitoring Coordinates	31°17'23.4"N 74°10'27.0"E

Parameter	Unit	Monitoring Duration	LDL	Average Obtained Concentration	PEQS
Nitrogen Dioxide (NO_2)	µg/m³	24 Hours	1.00	26.99	80.0
Nitrogen Oxide (NO)	µg/m³	24 Hours	1.00	14.64	40.0
NO_x	µg/m³	24 Hours	1.00	41.64	120.0
Sulphur Dioxide (SO_2)	µg/m³	24 Hours	1.00	16.92	120.0
Carbon Monoxide (CO)	mg/m³	24 Hours	0.01	1.13	5.0*
Ozone (O_3)	µg/m³	24 Hours	-	15.82	130.0**
Particulate Matter ($PM_{2.5}$)	µg/m³	24 Hours	1.00	23.63	35.0
Particulate Matter (PM_{10})	µg/m³	24 Hours	1.00	116.54	150.0
Suspended Particulate Matter (SPM)	µg/m³	24 Hours	1.00	174.17	500.0
Lead Airborne Particles	µg/m³	24 Hours	-	0.34	1.5

Abbreviations:
µg/m³= Micrograms per Cubic Meter
mg/m³= Milligrams per Cubic Meter
LDL= Lowest Detection Limit
PEQS= Punjab Environmental Quality Standards
*08 hour standard for CO
**01 hour standard for O_3

Monitoring Performed By:
Deputy Analyst
Muhammad Tahir

Name of Chief Analyst with Seal:
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Meteorological Data

Job Reference Number	GCEC-PK-LHR-163/2024
Monitoring Point	Center of Site
Date of Intervention	21-Oct-2024 to 22-Oct-2024
Monitoring Coordinates	31°17'23.4"N 74°10'27.0"E

GCEC-PK-LHR-155/2024

Time	Ambient Temperature °C	Wind Direction	Wind Velocity m/s	Humidity %	Pressure (mm of Hg)
12:00	34	NE	1.3	32	756.1
13:00	33	NE	1.6	34	756.6
14:00	32	NE	1.8	36	757.1
15:00	31	E	1.3	39	757.6
16:00	31	E	1.5	43	757.5
17:00	30	E	1.1	44	757.5
18:00	29	E	1	45	757.3
19:00	28	E	2	45	757.5
20:00	27	E	1.8	47	757.4
21:00	26	E	1.7	48	757.6
22:00	25	E	2.1	50	758.1
23:00	24	E	2.3	51	758.6
00:00	23	E	1.6	53	759.1
01:00	24	E	1.4	53	759.4
02:00	25	E	0.7	55	759.2
03:00	25	NE	0.8	57	759.1
04:00	25	NE	1.1	53	758.7
05:00	26	NE	1.5	50	758.2
06:00	26	NE	1.2	47	757.8
07:00	28	NE	0.8	45	757.5
08:00	30	NE	1.7	43	757.3
09:00	31	NE	1.3	40	756.9
10:00	32	NE	1.5	38	756.8
11:00	33	NE	1.1	35	757.2

Monitoring Performed By:

Deputy Analyst

Muhammad Tahir

Name of Chief Analyst with Seal:

Mr. Usman Raza Jaswal

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Noise Level Monitoring Report

Job Reference Number	GCEC-PK-LHR-193/2024
Monitoring Point	Center of Site
Date of Intervention	21-Oct-2024 to 22-Oct-2024
Monitoring Coordinates	31°17'23.4"N 74°10'27.0"E

Sr. #	Time	Method/Technique	Unit	Results LAavg	PEQS (Commercial)
		Night Time			
1.	23:00	Noise Meter	dB	51.7	
2.	00:00	Noise Meter	dB	50.9	
3.	01:00	Noise Meter	dB	48.2	
4.	02:00	Noise Meter	dB	53.7	
5.	03:00	Noise Meter	dB	49.8	55.0
6.	04:00	Noise Meter	dB	50.2	
7.	05:00	Noise Meter	dB	54.7	
8.	06:00	Noise Meter	dB	50.4	
	Night Time Average		dB	51.20	55.0
		Day Time			
9.	07:00	Noise Meter	dB	51.8	
10.	08:00	Noise Meter	dB	58.7	
11.	09:00	Noise Meter	dB	60.2	
12.	10:00	Noise Meter	dB	61.7	
13.	11:00	Noise Meter	dB	62.9	
14.	12:00	Noise Meter	dB	66.3	
15.	13:00	Noise Meter	dB	68.2	
16.	14:00	Noise Meter	dB	72.3	
17.	15:00	Noise Meter	dB	65.6	65.0
18.	16:00	Noise Meter	dB	60.3	
19.	17:00	Noise Meter	dB	60.2	
20.	18:00	Noise Meter	dB	55.2	
21.	19:00	Noise Meter	dB	54.7	
22.	20:00	Noise Meter	dB	59.1	
23.	21:00	Noise Meter	dB	50.8	
24.	22:00	Noise Meter	dB	52.4	
	Day Time Average		dB	60.71	65.0

Monitoring Performed By:

Deputy Analyst

Muhammad Tahir

Name of Chief Analyst with Seal:

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Pictorial Evidence for Ground Water Sampling & Ambient Air Monitoring

Figure 1: Ground Water Sampling

Figure 2: Ambient Air Monitoring

End of Report

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ANNEXURE V
LIST OF TEAM MEMBERS

\List of Team Members

Sr. #	Name	Qualification	Roles
Environmental Scientist			
i.	Mian Awais	BS (Hons) Environmental Science	Project Head
ii.	Dr. Afzal Hussain	PhD Environmental Science	Social Survey
iii.	Ms. Azka Anwar	M.phil Environmental Science	Report Writing
iv.	Ms. Kiran	BS (Hons) Environmental Science	Environmental Monitoring
v.	Mr. Shahzad	BS. Hons Environmental Science	Environmental Monitoring

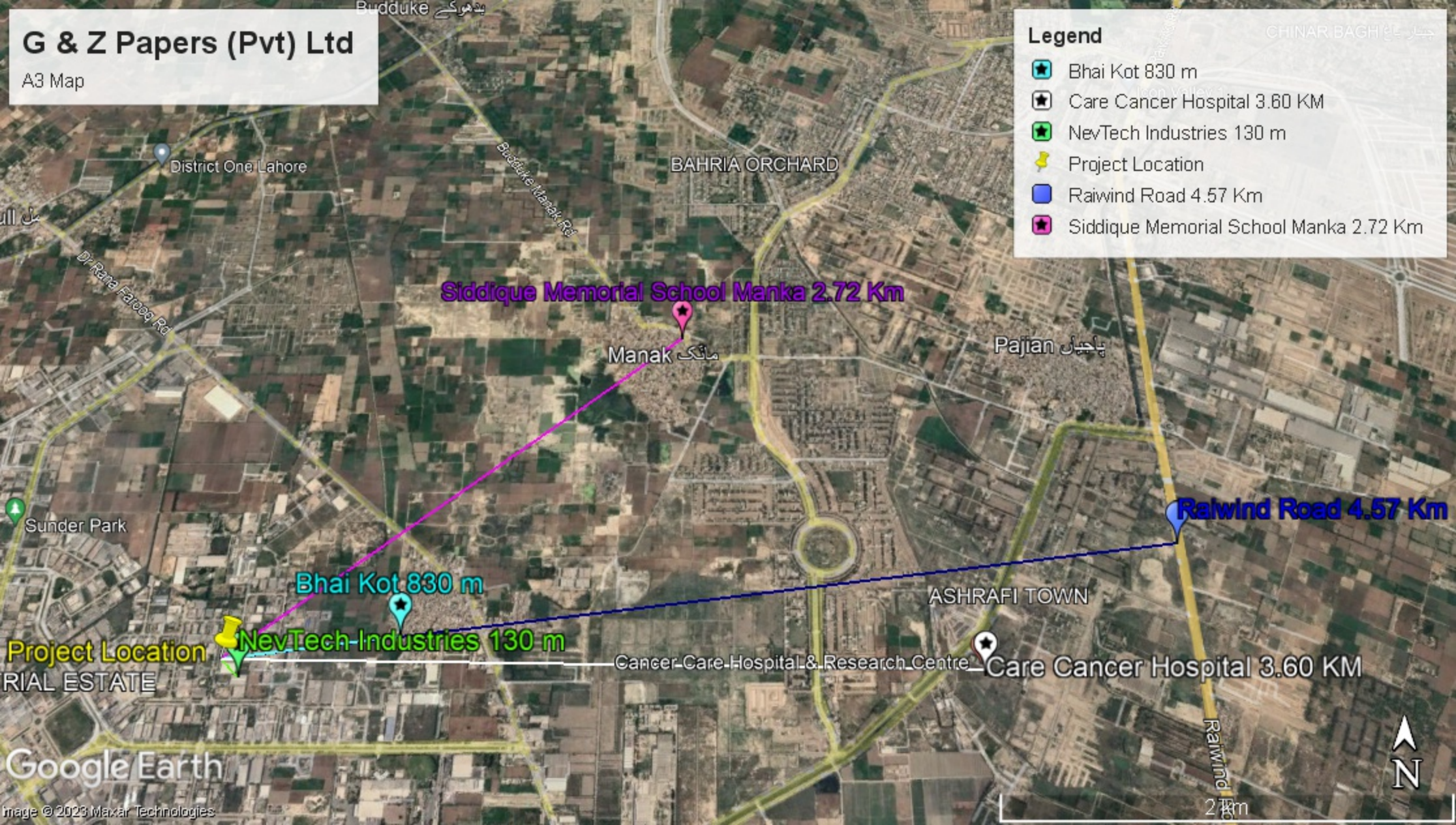
ANNEXURE VI
GLOSSARY

GLOSSARY

Alternatives	The evaluation of alternatives to project development in EIA (timing, location, technologies etc) including the no go, or no development action.
Ambient	Relating to the immediate surroundings of something
Contamination	Pollution
Conservation	The preservation of natural resources for use by future generations
Consultation	A process of communication with those potentially affected by a project, policy, plan or program.
Effluent	means any material in solid, liquid or gaseous form or combination thereof being discharged from industrial activity or any other source and includes a slurry, suspension or vapor
EMP	An EMP is a site specific or project specific plan developed to ensure that appropriate environmental management practices are followed during a project's construction and operation.
Environment budget	Monitory assets reserve for environmental activity
Environment	means air, water and land; all layers of the atmosphere; all organic and inorganic matter and living organisms; the ecosystem and ecological relationships; buildings, structures, roads, facilities and works; all social and economic conditions affecting community life; and the inter-relationships between any of the factors mentioned
Environmental Audits	An environmental management tool consisting of a periodic and objective evaluation of an organization and installations to assess compliance with regulatory and other requirements, as defined by audit criteria
Environmental	means an environmental study comprising collection of

Impact Assessment	data, prediction of qualitative and quantitative impacts, comparison of alternatives, evaluation of preventive, mitigatory and compensatory measures, formulation of environmental management and training plans and monitoring arrangements, and framing of recommendations and such other components as may be prescribed
Extent/ Magnitude	The size or degree of the predicted impact
Fauna	Animal life occurring in particular region or time
Flora	plant life occurring in particular region or time
Geological	Relating to the study of the earth's physical structure and substance.
Impact	The consequence of an action or activity on the human or natural environment. Impacts may be positive, negative or neutral
Issue	A question or concern regarding an environmental impact, consequence or effect
Mitigation	Prescribed actions taken to prevent, avoid, reduce or minimize the impacts or potential adverse effects of a project
Monitoring	A combination of observation and measurement to assess the environmental and social performance of a project and its compliance with EIA/ EMP, or other approvals and regulatory conditions
Particulate Matter	A complex mixture of extremely small particles and liquid droplets that get into the air
Proponent	the person who intends to carry-out a proposed project
Sustainable development	Economic development that is conducted without depletion of natural resources.
Waste	means any material, substance, or by-product eliminated or discarded as no longer useful or required after the completion of a process

ANNEXURE VII
GOOGLE EARTH MAP


G & Z Papers (Pvt) Ltd
A3 Map
Legend
Bhai Kot 830 m
Care Cancer Hospital 3.60 KM
NevTech Industries 130 m
Project Location
Raiwind Road 4.57 Km
Siddique Memorial School Manka 2.72 Km
District One Lahore
BAHRIA ORCHARD
Budduke Manak Rd
Dr Rana Fazoog Rd
Siddique Memorial School Manka 2.72 Km
Manak مانک
Pajian پاجیاں
Sunder Park
Raiwind Road 4.57 Km
Bhai Kot 830 m
ASHRAFI TOWN
Project Location
NevTech Industries 130 m
Cancer Care Hospital & Research Centre
Care Cancer Hospital 3.60 KM
RIAL ESTATE
Raiwind Rd
N
Google Earth
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