F-294(EIA)-23

DON VALLEY



ENVIRONMENTAL ASSESSMENT REPORT

DON VALLEY PHARMACEUTICAL

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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
Engr.	Engineer
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

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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

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EXECUTIVE SUMMARY

INTRODUCTION

The executive summary presents an overview of the main findings of Environmental Impact Assessment (EIA) report for the Establishment of pharmaceuticals manufacturing unit of M/S Don Valley Pharma located at 31-km, Main Lahore – Kasur Rd, Lahore.

Don Valley Pharma manufactures pharmaceutical finished products. It has a team of qualified & experienced professionals who are engaged with focused approach, to produce the quality products.

M/S **Exodus Green** has been engaged for conducting Environmental Impact Assessment (EIA) of Medicines Manufacturing unit of M/S Don Valley Pharma.

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.

This executive summary presents an overview of the main findings of the EIA report for the aforesaid project i.e. Medicines Manufacturing Industry of M/S Don Valley Pharma.

PROJECT OUTLINE (Details are given in Chapter2)

This report is related to the Establishment of Pharmaceutical Manufacturing Unit. Total area of land is 55 Kanal 14 Marla. The said site lie sat Latitude 31.4121187, and Longitude 74.2900091. The production process for finished products begins with the collection of the right raw materials. When new raw materials arrive, they are first placed in quarantine until they are analyzed and cleared for release. This is always carried out by a qualified person. M/S Don Valley Pharmaceuticals manufactures many pharmaceutical products of different categories. The raw materials are mixed in a mixer. When the mixture is ready in its finished form, it is packed into blisters or bottles. The product categories include Tablets, Capsules and Liquids mainly. After a product has been filled and packed, it is labeled and packed in final

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cartons or containers which is then placed in finished products storage area from where they are delivered to market for sale.

Salient features of project:

Proponent Name:	Shahla Javed Akram
Project Title:	**Establishment of Medicines Manufacturing unit of M/S Don Valley Pharma.**
Project Location:	31-km, Main Lahore – Kasur Rd. Lahore
Name of Organization preparing report	**Exodus Green**
Total Land Area	55 Kanals 14 Marla
Cost	**556 Million approximate**
Products	Tablet, Capsule, Syrup, Cream & Ointment, Dry Powder Suspension & Sachet
Source of Water	**Ground water, Water Treatment Plant is provided to ensure quality of medicines**
Nearest Industry	KBK Electronic Pvt Ltd Pulse pharmaceutical Industries
Source of Power:	WAPDA Supply
Waste water:	Wastewater will be Drain after proper treatment through activated sludge process for which treatment plant has already been installed.
Solid Waste Management:	Rejected material will be delivered back to supplier. Domestic waste will be handed as per area practices.
Boiler Heating Surface	N/A

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MESSAGE FROM THE CEO



I am proud to say that we, at Don Vally Pharma, have been making strides in the direction of environmental sustainability. We have invested in state-of-the-art technologies and processes that allow us to reduce our carbon emissions, minimize water usage, and decrease waste generation. By doing so, we not only fulfill our corporate social responsibility but also contribute to a healthier planet for future generations.

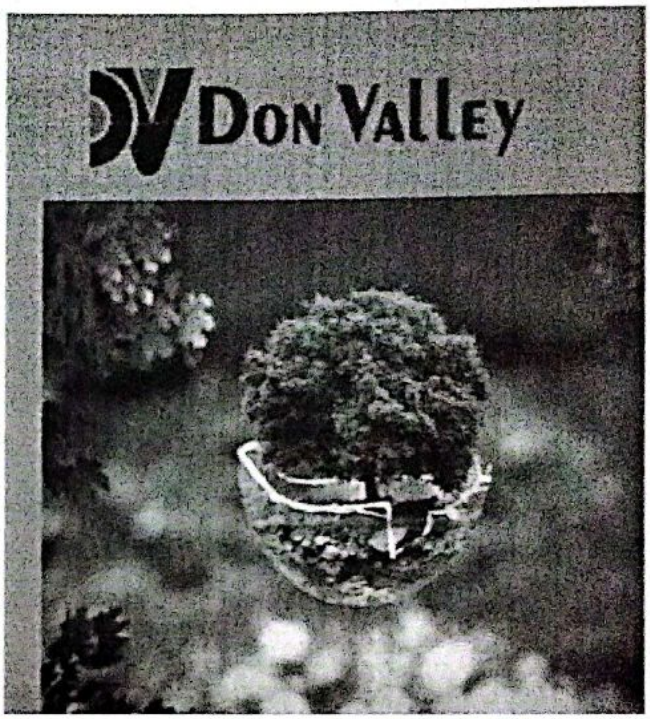
Our commitment to environmental sustainability is not just a corporate directive; it is a responsibility we all share. I encourage every member of our team to consider the environmental impact of their actions, from product development to daily operations. We must all be mindful of reducing waste, conserving resources, and seeking eco-friendly solutions in our work.

In the coming years, we will intensify our efforts to further integrate sustainability into every facet of our business. This will involve setting clear targets, monitoring our progress, and collaborating with suppliers and partners who share our commitment to a greener future.

I urge each of you to embrace this mission and become champions of environmental sustainability within our company. Together, we can make a meaningful difference, not only in the pharmaceutical industry but also in the world at large.

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ABOUT THE COMPANY



We are a Pakistan based pharmaceutical company run by a family of visionary doctors. Our manufacturing facility located on the Main Ferozepur Road in Lahore is ISO 9001:2015, 14001:2015 and 45001:2018 certified and is compliant with the latest cGMP and cGLP standards.

Established since 1995, Don Valley Pharmaceuticals through its higher standards of production and its modernistic manufacturing facility is renowned for providing quality healthcare products at affordable costs while meeting and exceeding international standards.

We pride ourselves on operating some of Asia's most sophisticated pharmaceutical machinery, including an active R&D Department and state-of-the-art Quality Control and Microbiology laboratories.

The dedication of our employees and their commendable work ethic is what differentiates us from our competitors. We value our employees and treat them like family because only by operating as a strong cohesive unit can we truly work for the benefit of our customers.

Don Valley has managed to carve a niche for itself in the world of Pharmaceuticals with its annual sales having reached US $15 million across Pakistan, Asia and the African regions. Our products span the entire continuum of care including anti-infective, diabetes, cardiovascular, anti-ulcer, gastroenterology, anti-anemic, anti-epileptic, anti-depressant, vitamins and analgesic.

In addition to employing a highly trained sales and marketing team spread across the region and an extremely sound distribution network, we are also a major player

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in supplying pharmaceutical drugs to Government Hospitals and Institutions.

Today, Don Valley aspires to reach higher export goals and explore further avenues in product innovation and development. We are already in the planning phase of launching fully automated injectable and nutraceutical units whilst effectively developing our sales in Sri-Lanka, Kenya, Uganda, Nigeria, Myanmar, Cambodia, Vietnam, Yemen, Afghanistan, Philippines, Somalia, Guinea, Sudan, Burundi, Iraq, and many others.

We are extremely excited about the journey we have made so far and sincerely believe that the best of Don Valley is yet to come!

CONTRIBUTION TO THE SUSTAINABLE GOVERNANCE

Sustainable pharmaceutical governance is a critical aspect of ensuring that the pharmaceutical industry operates in a manner that is environmentally, socially, and economically responsible. Here are some contributions that can help advance sustainable pharmaceutical governance:

Environmental Stewardship:

Pharmaceutical companies can contribute by implementing eco-friendly practices in their manufacturing processes. This includes reducing water and energy consumption, minimizing waste, and adopting green chemistry principles to reduce the environmental impact of drug production.

Research and Development for Sustainable Drugs:

Encouraging the development of pharmaceuticals that are less harmful to the environment, such as those that degrade more easily in the environment, is essential. Additionally, supporting research into alternative, sustainable drug delivery methods, such as nanoparticles or biodegradable materials, can be part of this contribution.

Transparency and Ethical Marketing:

Ensuring that pharmaceutical companies adhere to ethical marketing practices and disclose the potential environmental and health impacts of their products is crucial. This can involve strict regulations and oversight to prevent the promotion of unnecessary or harmful drugs.

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Access to Medicines:

Sustainable pharmaceutical governance should also encompass ensuring affordable access to essential medicines, particularly in low-income and underserved areas. Companies can contribute by offering fair pricing structures, especially for life-saving drugs.

Pharmacovigilance:

Effective monitoring and reporting of adverse drug reactions and side effects are essential for patient safety and the environment. Contributing to robust pharmacovigilance systems helps identify and address issues promptly.

Collaboration with Regulatory Bodies:

Collaboration with regulatory agencies is vital. Contributing to the development and adherence to stringent environmental regulations for pharmaceutical manufacturing can lead to more sustainable practices.

Research into Green Chemistry and Sustainable Technologies:

Investing in research on green chemistry and sustainable manufacturing technologies can lead to innovations that minimize the environmental footprint of pharmaceuticals.

Reducing Antibiotic Resistance:

Contributing to efforts to combat antibiotic resistance, such as responsible antibiotic use and the development of alternative treatments, is essential for both public health and environmental sustainability.

Supply Chain Sustainability: Ensuring that the entire pharmaceutical supply chain, from sourcing raw materials to distribution, is conducted in a sustainable and ethical manner is a significant contribution.

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.

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- Provision of local high-quality medicine.
- Potential of improvement for social and cultural values of local people's exchange of values and standards through positive social interactions.
- Positive changes in lifestyles will occur due to availability of income when the natives take up Company jobs.

Negative Impacts:

Impacts	Mitigation measures
Construction phase	
Dust Emissions	Most of the dust generating activities during construction last for a brief period. Thereafter, vehicular movement generates most of the dust. Dust will be suppressed using water bower 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 masks and ensuring that they are worn. • Operating well-maintained vehicles and equipment.
Wastewater	• Portable toilets with septic tanks were provided to workers during construction phase.

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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, earplugs/muffs, safety boots, safety goggles, safety jackets, harnesses etc. and its use will be strictly enforced. • Workers will be trained on a 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 a daily basis to ensure a clean environment in the factory site. • An 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 as per practices of area. • 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.

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Operation Phase	
Particulate emissions and generator stake missions	• No air emission is likely to be released during operation of the project; except the duster PM to be produced during floor cleaning and other such operations, which also will not be posing any environmental threat (will not breach the safe standards). Wet suppression is done to control dust emissions. • Generator emissions will be controlled by providing proper enclosure, tuning and maintenance. Boiler emissions will be controlled by using natural gas as fuel.
Degradation of surface waters quality due to process water and sewage direct disposal	• Wastewater will be disposed of in Tehsil Council Drain after proper treatment through activated sludge process for which treatment plant has already been installed.
To minimize loss work injury/hazards/incidents/accidents	• Training regarding EHS should be given on a regular basis. • Workers will be given PPEs such as helmets mask, ear plugs /muffs, safety boots, etc. • It should be strictly enforced to wear PPEs while working. • Workers will be trained on a regular basis regarding personal safety and disaster management. • Incidents should be reported directly to the concerned authority

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	• A thick green belt will be developed all around the plant which will act as noise barrier. • Introduction of control and monitoring rooms having good sound insulation properties. • 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	• No process waste will be generated as the whole project will be carried out in closed tanks, while domestic waste will be handled as per area practices. For collection of solid waste dust bins are kept in the unit premises to manage the waste. Discarded/Rejected material will be sent back to supplier.

ENVIRONMENTALMANAGEMENT& MONITORINGPLANS:

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 need to be monitored. Plan has been included in **Chapter-6** of this EIA Report.

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1 CHAPTER 1: INTRODUCTION

1.1 GENERAL

The pharmaceutical industry in any country is considered as the mainstay of public health. Looking at the global scenario, the importance given by developing nations to the pharmaceutical sector can be clearly identified by including healthcare and pharmaceutical industry in their health and welfare strategy. The global pharmaceutical market is valued at no less than US$1.48trillion, with annual growth of 7.8%.

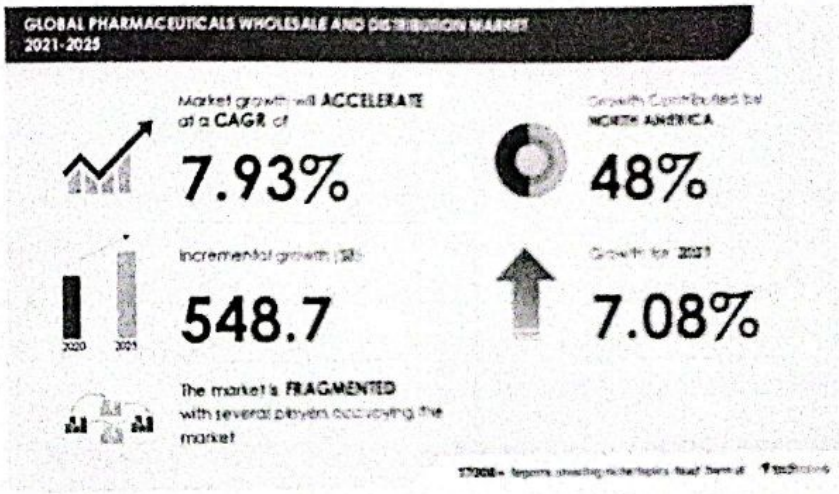


Figure 1: Global Sale, Pharmaceuticals (%)

The pharmaceutical industry is considered the backbone of public health services in Pakistan. This is strategically important both for the wellbeing of the population in general and for the provision of good yet affordable healthcare in particular. The low cost of production and the huge potential of this sector has attracted major multinationals to establish their operations and production facilities in Pakistan.

Pakistan's Pharmaceutical industry started out slowly but gradually became an integral contributor to the developing economy of Pakistan. At the time of formation, there were only 10 members of Pakistan Pharmaceutical Manufacturers Association (PPMA), as of 2015 there were around 235 companies holding membership. Pharmaceutical industry is one of the most organized industries in Pakistan, employing a large number of professionals in all areas of operations. Pakistan meets 80% of its domestic demand of medicines from local production and 20% through imports. The market for pharmaceuticals in Pakistan has been

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expanding at a rate of around 10 to15% since last few years.

Pakistan is also exporting its surplus drugs to a large number of countries particularly to the Asian and African regions with an expanding trade in the newly emerged Central Asian States. Presently, the pharmaceutical industry in Pakistan is producing all the major pharmaceutical dosage forms. Similarly, there are some special products e.g., immunological, anti-cancer drugs, certain anti-diabetics, antidotes, and products manufactured from biotechnology, which are still being imported, in the finished form. These specific areas provide excellent opportunities for investment. Only a few bulk pharmaceutical raw materials are being manufactured locally and most of the pharmaceutical raw materials are being imported in large quantities from different countries of the world. This sector also gives the challenge to explore and avail the opportunities.

Pakistan's Pharmaceutical market is very significant in the World market as it is the 10th largest in Asia Pacific and the 4th fastest growing market (2008/09) after China, India & Vietnam. The total worth of Pakistan's Pharmaceutical industry is measured at Rs. 191 billion (USD 1.8 Billion) in September 2015 most of which is down to private sector investment. The private sector contributes to an overwhelming 82.5% of the total health expenditure. The figure below provided in sight of growth trend for both MNC's and National pharmaceutical companies.

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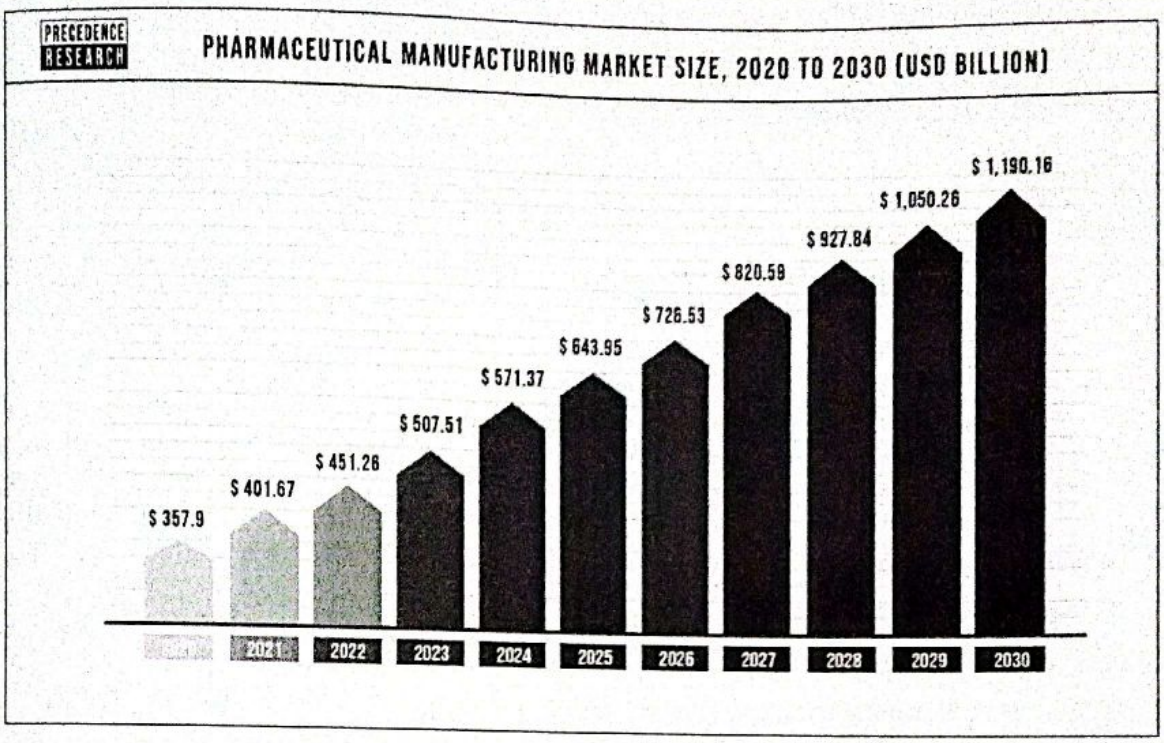


Figure 2: Growth Trend of National and Multinational Pharmaceutical Companies

Some key statistics of Pakistan Pharmaceutical Market are as follows:

Table 1: Statistics of Pakistan Pharmaceutical Market

Enterprises / Companies active in the field	600
Number of Employees	Over 100,000
R&D Expenditure	1% of profit (by each company) goes to R&D Fund of the Ministry of Health
Registered Drugs	47000
Registered Molecules	1100
Controlled Price Drugs	Almost All
Estimated Size of the Pharmaceutical Market	2.6Billion US$ (IMS Q4, 2015)
Total Registered Pharmaceutical in Pakistan	Approx.660
Multinational Pharmaceutical Company	18
National Pharmaceutical Company	641
Projected Growth of Market in 2016	13.06%

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The pharmaceutical industry in Pakistan comprises of over 400 pharmaceutical manufacturing units including around 30 operated by multinationals present in Pakistan. Province wise break up of Pharmaceutical Manufacturing Units in Pakistan is given below:

Table 2: Province wise breakup of Pharmaceutical Manufacturing units in Pakistan

Province	National	Multinational	Total
Punjab	205	4	209
Sindh	92	23	115
KPK	50	0	50
Baluchistan	7	2	9
AJK	3	0	3
Total	356	30	386

The key to the success of Pakistani pharmaceutical companies is based on a simple formula, i.e. the production of high-quality products at current Good Manufacturing Practices (cGMP), compliant facilities and offering them at the most economical rates. Nearly all of Pakistan's leading pharmaceutical companies have maintained high standards to ensure compliance of all operations of production and quality control under the cGMP guidelines. As a result, they are now successfully exporting their products to various international territories.

As per PEPA 2012 and the IEE/EIA Regulations, 2000 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 (EIA) for the aforesaid medicines manufacturing unit. For this purpose, the proponent has engaged environmental consultants, M/S Exodus Green. The purpose of this study is to identify the environmental baseline i.e. physical, biological, and socio-economic/cultural conditions and assess all possible impacts arising during the construction and operation phase of the project with the aim to find out appropriate measures for their mitigation, to either eliminate those impacts or to bring them to acceptable level and formulate Environmental Management Plan (EMP) for implementation of the project in environment-friendly manner. There port 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.

THE PROPONENT (CEO/Director)

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Name	Shahla Javed Akram
Address	House 15 C 11, Mohalla M M Alaam Road Gulberg 111,Lahore
Contact Number	03008461857

1.2 THE PROJECT

1.2.1 Nature of Project

The Said Project is the Establishment of Pharmaceutical Manufacturing Unit of M/S Don Valley Pharma. Its salient features have been described later in this Chapter, Chapter 2 and briefly in Executive Summary of this EIA Report.

1.2.2 Location of Project

Said Project is located at:

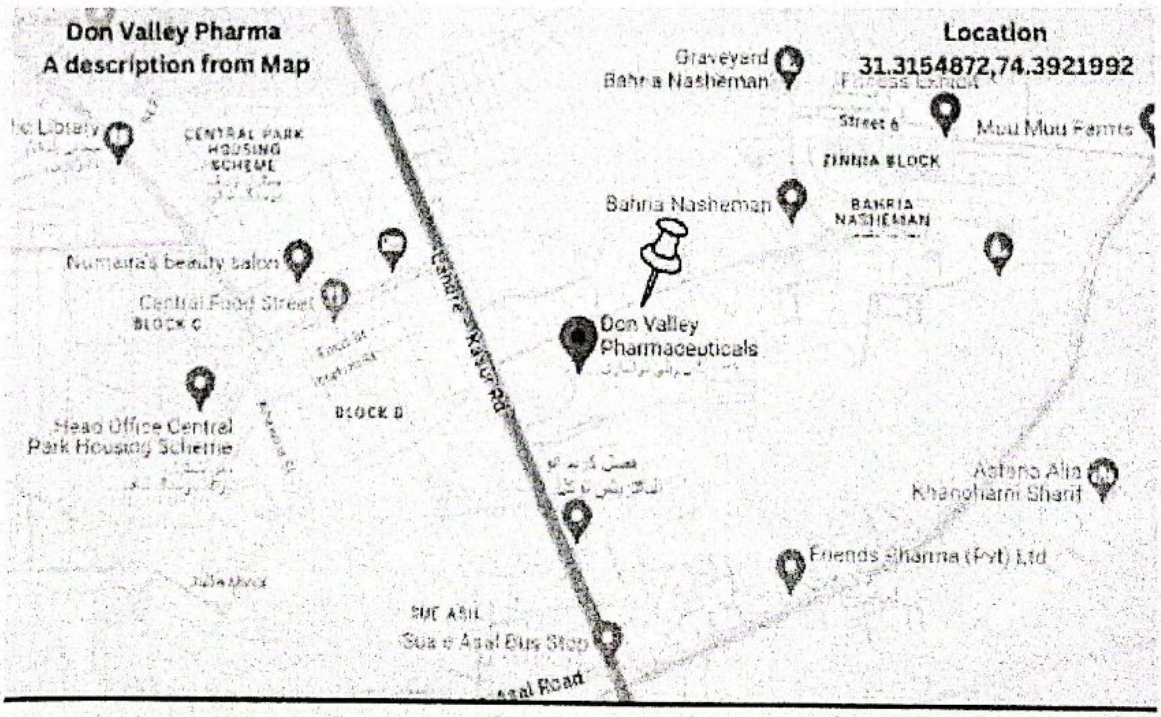


Figure 3: Location Site

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1.2.3 Total area

Total area of land is approx. 55 Kanals,14 Marla

1.3 DETAILS OF CONSULTANTS

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

Exodus Green provides quality services in various environmental sectors i.e.

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

Contact Details:

Focal Person	Tariq Khalil
Address	House 189 B, Iqbal Avenue Phase 3, Lahore
Contact No.	0304-8968536

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Study team:

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

Table 3: List of Experts

Sr.#	Name	Qualification	Role
		Engineers	
i.	Engr. Shabbir Ahmed	Mechanical Engineering	Monitoring and Testing
ii.	Engr. Asma	M.Sc. Environmental Engineering	Designing and Report review
iii.	Dr. Asad	Pharma-D, M.Phil. Pharmacology	Process details
iv.	Engr.	M.Sc. Chemical Engineering	Socioeconomic Survey
v.	Ms. Ayshea	B.Sc. Environmental Sciences	Report preparation
vi.	Ms. Kalsoom	M.Sc. Chemical Engineering	Collection of Baseline data
vii.	Tabana Iram	M.Sc. Chemistry	Site survey and analysis of impacts on surroundings
viii.	Hamadia Mehmood	Graduation	Coordinator

1.4 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

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the baseline conditions, evaluate the possible adverse impacts if any, and devise the mitigation measures.

Section 12 of Pakistan Environmental Protection Act, 1997 (PEPA, 1997) states "No proponent of a project shall commence construction or operation unless he has filed with the Provincial Agency an Initial Environmental Examination (IEE) and, where the project is likely to cause an adverse environmental effect, an Environmental Impact Assessment (EIA), and has obtained approval from the Provincial Agency in respect thereof." Later on, Punjab Environmental Protection Agency (Review of IEE and EIA) Regulations, 2000 provided the guidelines for categorizing the Projects. The main objectives of this EIA study were:

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

1.5 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

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report predicts the probable impacts on the environment due to the said project. This EIA also proposes various environmental management measures. Details of all background environmental quality, environmental impact/pollutant generating activities, pollution sources, predicted environmental quality and related aspects have been provided in this report. The structure of the assessment report will be as follows:

- Description of the Project
- 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

SCREENING & SCOPING

Screening

As per Review of Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) Regulations, 2000 the Said Medicines Manufacturing Unit falls under B(2) Category of projects "**Manufacturing and processing**" mentioned in Schedule II requiring EIA

Scoping

Temporal and Spatial Boundaries:

Temporal Boundaries:

The construction period of said project is approx. 2 years. Operation Lifespan will be more than 25 years.

Spatial Boundaries:

Said project will have positive and negative impacts at local and national level. The establishment of the said project will contribute to enhancing Pakistan's domestic productivity and help diversify Pakistan's economy. It will create potential of improvement for social and cultural values of local people's exchange of values and

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standards through positive social interactions. Positive changes in lifestyles will occur due to availability of income when the natives take-up Company jobs.

Important issues and concerns raised during consultation:

- Environmental enhancement measures such as Tree plantation, monitoring and safety should be ensured.
- HSE plan should be enforced strictly.
- Preventive measures should be adopted to avoid any unfortunate incident.
- Tree plantation must be ensured.
- Local employment should be ensured.
- Proponent shall work for betterment of community.
- All emissions and effluents shall be managed properly to avoid public nuisance.

Significant Impacts identified in scoping:

Construction Phase	Operation Phase
Dust emissions	Particulate emissions
Waste water	Degradation of surface water quality due to process water and sewage direct disposal
Impacts of accidental spillages	Work injury/ hazards/ incidents/ accidents
Safety	Disturbance of communities due to noise
Solid waste management	Solid waste management

ALTERNATIVES

Site Alternatives

Said project is the Establishment of M/S Don Valley Pharma (Pvt.) Ltd. Selected site is surrounded by other industries and no other alternative site is considered for Said Project. The site is well located regarding the following:

- Within vicinity of existing unit

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- Plot near other industries
- Easy road access to the market
- No settlements in close vicinity
- No water course within a safe distance
- No ecologically sensitive or declared protected area within safe radius 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.

Distance of selected site from different receptors is as follows:

Sr. No	Receptors	Distance (Km)
1.	KBK Electronics	0.73
2.	Irfan Textiles	0.5
3.	Lahore Kasur Road	4.09

Considering the facts that said site is at a safe distance from sensitive receptors. The said site has the advantage of not only to be environment-friendly but also potentially sound to enhance sustainable development in the region. Therefore, the given site is the most suitable for establishment of said project.

Process/ Technology Alternative

Keeping in view, all the environmental consideration the project site is located in an industrial area using the best suitable technology for air emission and for the treatment of wastewater. Best suited technology has been proposed for the said project including no air emission. Water mitigation techniques are also considered at their best including Activated Sludge Process for wastewater treatment.

Environmental Alternative

The unit site is located in an area which is devoid of any biodiversity including forestry, wildlife, migratory birds, game reserves (flora and fauna), or protected species of fauna & flora, fishery or aquatic biology, watershed. There is no cultural or any other heritage in the project area. Summarily, there is no environmental sensitivity in the project area. These factors are also strongly supportive of the proposed project site.

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Economic Alternative

Selected land is under ownership of proponent and no cost is required to purchase other land so it is viable and economic option for proponent to construct frozen fries unit. The cumulative effect of this type of project would result in noticeable economic growth. The project will also make a positive consideration to industrial growth.

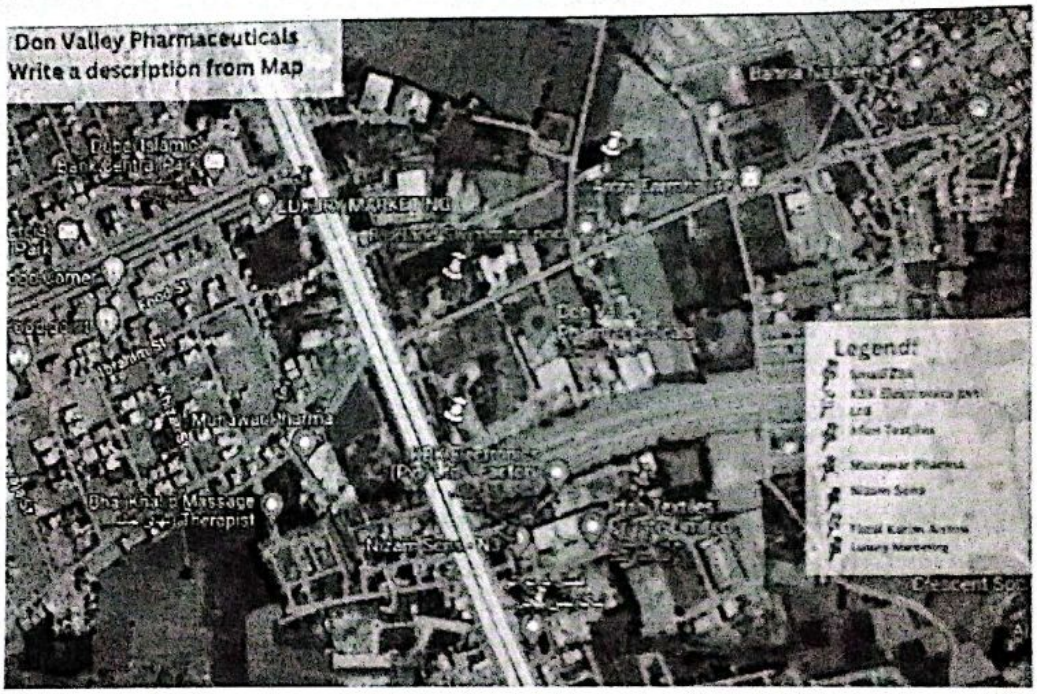


Figure 4: Distance of site from nearest receptor

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2 CHAPTER 2: DESCRIPTION OF PROJECT

2.1 GENERAL

This section of the study concentrates on details of the project and its salient features, such as location, site layout, objectives, selection of alternatives, cost and magnitude of operation and various phases. Inputs and discharges relevant to different phases of the project, such as electricity & materials, etc. have also been examined as a response to possible environmental concerns.

2.2 TYPE AND CATEGORY OF PROJECT

As per Review of Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) Regulations, 2000 the Said Medicines Manufacturing Unit falls under B(2) Category of projects "**Manufacturing and processing**" mentioned in Schedule II requiring EIA.

2.3 OBJECTIVES OF PROJECT

The main objective for the Establishment of Project is to carry out the competitive business of manufacturing high quality Pharmaceutical Finished products, also to meet market demand at affordable prices through dedication, sincerity, hard work and attitude. Also, Proponent's intention is to become one of the most valued medicines manufacturing industry by continuously manufacturing good quality products that comply with the highest regulatory standards.

2.4 LOCATION AND LAYOUT OF PROJECT

2.4.1 Location of the Project

Said Project site is located at 31 Km Kasur Road off Ferozepur Road Lahore, The said site lies at Latitude 31.4121187, and Longitude 74.2900091.

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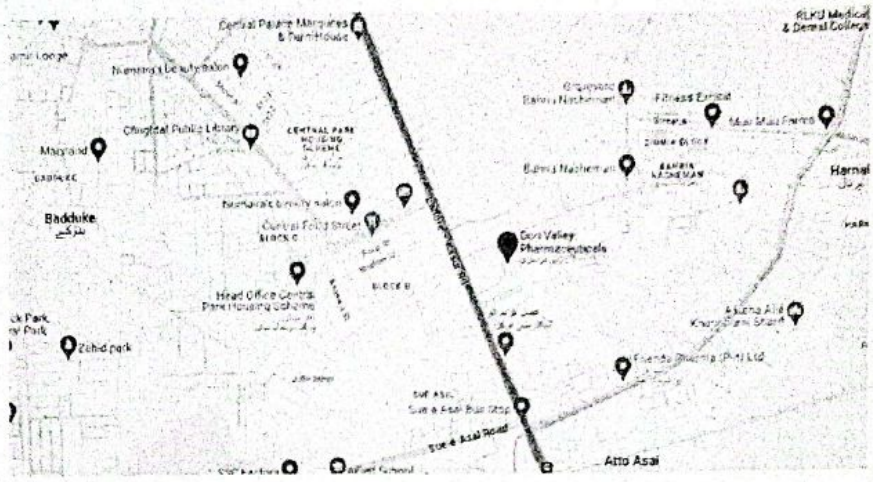


Figure 5: Location Map of the Site

2.5 GOVERNMENT APPROVALS

Approval for DRAP Approved Map is attached.

2.6 LAND USE ON SITE

Land use on site for Exodus Green is open land. The site will be used for the establishment of pharmaceutical industry. There is no settlement, grassland, or preserved area in the proximity of the project area that could be damaged or dismantled.

2.7 ROAD ACCESS

The site is approachable via Lahore-Kasur Road at 31 km.

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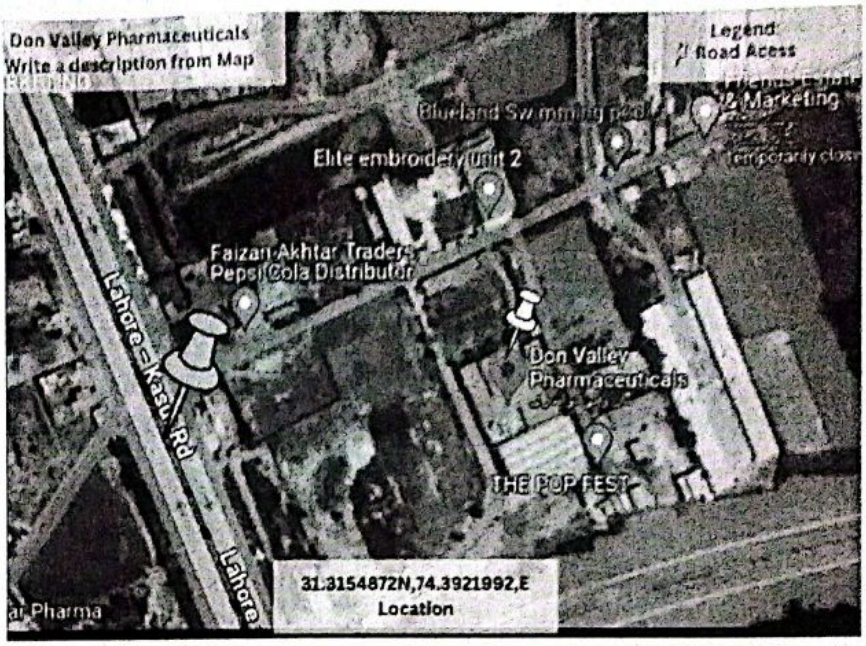


Figure 6: Road Access

2.8 VEGETATION FEATURES OF SITE

Various local plants are grown at the project site in the open areas, and along the boundary.

2.9 RESTORATION AND REHABILITATION PLANS

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

- All temporary construction built for the site development will be removed.
- Site for construction camps should be restored to its previous conditions as much as possible.
- Any debris from construction activities should be removed properly from the site.
- All fencing and gates will be removed, and pits will be back filled.
- The whole of the site will be covered with the original soil to the original

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levels and grades and re-vegetation will be done, where required.

- There exists no human settlement within safe radius of the selected project site to be displaced doing to the commencement of the said Project. No structure of any significance stands at the site to be relocated.

Residence	Distance
Bahria Neshamen	600 m



Figure 7: Distance of site from nearest residence

2.10 DESCRIPTION OF PROJECT

2.10.1 Raw Material and products

List is attached as annexure.

2.10.2 General Process

Don Valley Pharma is involved in manufacturing many Finished Pharmaceutical Products, the list of which is attached in Annexure. Generalized procedure for manufacturing of pharmaceutical finished products is given below:

RECEIVING BAY AND DEDUSTING AREA

The raw material, both active and inactive, is received in the receiving bay and

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dusting is done to remove any dust from packs to avoid any contamination.

QUARANTINE AREA

Quarantine area is classified into three sections via three different color boundaries including yellow, red, and green lines. Yellow boundary line area is for the raw material, which is under quality control testing, while green line area is for the raw materials which have been released by quality control department for manufacturing. The red boundary line area is for those raw materials which have been rejected by the quality control department and should not be used in manufacturing, which will be sent back to company from where purchased. The raw materials, in their final containers are transferred to quarantine area of yellow boundary 1st until they are under testing by quality control department. Once it gets released by the quality control department, it is shifted to green colored line boundary area for use in manufacturing process of syrups. The temperature and humidity are controlled properly and maintained at a temperature of 25±5^{0}c and humidity of 55±5%. Separate rooms are provided for storage of active ingredients and inactive ingredients. Regular temperature and humidity testing is conducted in these storage rooms. Relative Humidity of 45 and Temp of 25^{0}c is being maintained.

SAMPLING AREA

The sampling area is the specified area with proper air circulation via HVAC system. In this area, the raw materials are selected by random sampling under the supervision of qualified pharmacist. Samples are taken from upper, medium, and bottom layers of containers and are supplied to the quality control department for testing of raw material. Once the raw material has been approved and released by the quality control department for manufacturing, it is transferred to the dispensing area.

DISPENSING AREA

The released raw materials, both active and inactive ingredients, by quality control department are dispensed in this section using digital weighing balances under supervision of pharmacist. These are dispensed and are transferred to manufacturing areas.

MANUFACTURING AREA

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The manufacturing area contains machinery according to the product to be manufactured. The active and inactive raw materials are transferred to the manufacturing tank and RO water is stored in RO water tank from where it is supplied to manufacturing tanks via some pipes. Automatic Mixing is done to prepare homogeneous solutions. In the process samples are taken and supplied to the quality control department. Once released the manufactured product is transferred to storage tank until filled, labeled, and packed.

WASHING AND DRYING AREA

In the washing area the vials are washed along with caps using RO water. These washed bottles are then sterilized, and oven dried at 250°c to remove any dust particulate matter.

FILLING AREA

The filling area contains syrup/suspension filling machines. While for tablets and capsules, they are packed in blisters or strips. Once the samples get approved by the quality control department, they are transferred for labeling and packaging.

LABELLING AREA

In labeling section, the various manufacturing details are printed onto the primary pack like batch number, date of manufacturing, maximum retail price of the therapeutic, etc. as required by Drugs Act.

PACKAGING AREA

Pharmaceutical manufacturers have to pack their medicines before they can be sent out for distribution. The type of packaging will depend on the formulation of the medicine. 'Blister packs' are a common form of packaging used for a wide variety of products. They are safe and easy to use and they allow the consumer to see the contents without opening the pack.

Primary packaging is the material that first envelops the product and holds it. This usually is the smallest unit of distribution or use and is the package which is indirect contact with the contents. Secondary packaging is outside the primary packaging – perhaps used to group primary packages together. Tertiary packaging is used for bulk handling, warehouse storage and transport shipping. The most

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common form is a palletized unit load that packs tightly into containers. Some of the primary packed bottles/ blisters are supplied to quality control department for in process quality control testing to check label and its specifications. Once approved these bottles/blisters are then packed into secondary packaging materials i.e., cartons and are stored in finished goods till they are dispatched in market.

2.10.3 SUSPENSION MANUFACTURING

Suspension is an important class of pharmaceutical dosage forms. The manufacturing of pharmaceutical suspensions involves several steps. The first step is to obtain particles of the proper size typically in the micrometer range. Pharmaceutical suspensions are usually prepared either by direct incorporation/dispersion method or by precipitation method.

Direct Incorporation method involves following steps:

- Dissolution of the soluble components in the appropriate volume of diluents (vehicle).
- Dispersion of the solid therapeutic agent into the vehicle with the aid of mixing, prior to correction for volume.

The preparation of suspensions by precipitation method is as follows:

- The drug is dissolved in the vehicle (or apportion of the available volume), prior to precipitation following the addition of a counterion, the salt formed is insoluble (such systems are frequently deflocculated and are therefore mixed at low shear rates).
- The percipients are then dissolved in the vehicle, or dissolved in a portion of the vehicle, which is then added to the suspension of drug.

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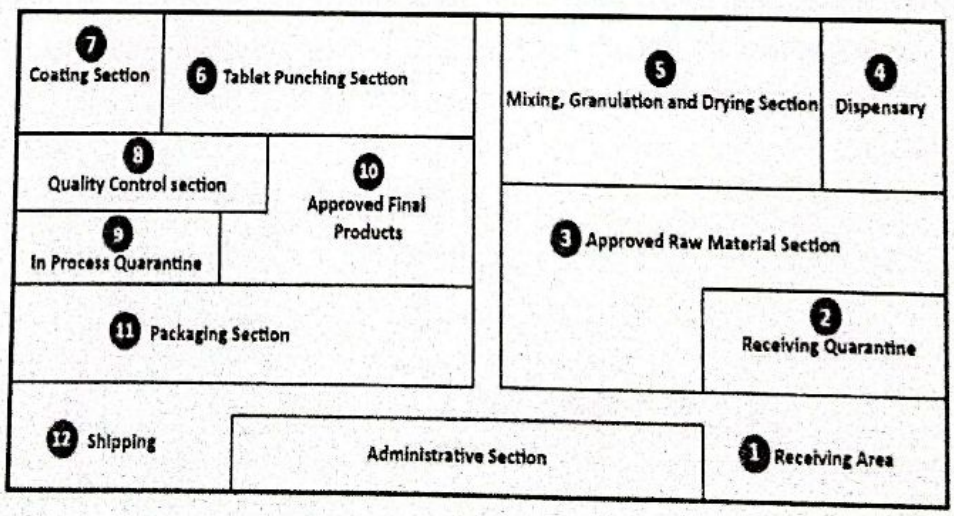
2.10.4 TABLET MANUFACTURING

Since decades among all the pharmaceutical products available, oral drug delivery has gained a higher scope and popularity and has been widely employed for the systemic delivery of drugs. The positive aspect regarding the oral dosage form which created its high level of acceptance was its ease of administration, patient compliance and stability of formulation.

The design and manufacture of pharmaceutical tablets is a complex multi-stage process whereby formulation scientists ensure that the correct amount of drug substance in the right form is delivered at the appropriate time, at the proper rate and in the desired location with its chemical integrity protected to that point. Most drug substances do not possess the required properties which gives is factory flow from the hopper to the die cavity of tablet presses. As a result, they are subjected to pre-treatment either alone or in combination with suitable excipients to form free-flowing granules that lend themselves to tableting.

Tablets are commonly manufactured by **wet granulation, dry granulation or direct compression.** Regardless of the method used the unit processes–weighing, milling, and mixing, are the same subsequent steps differ.

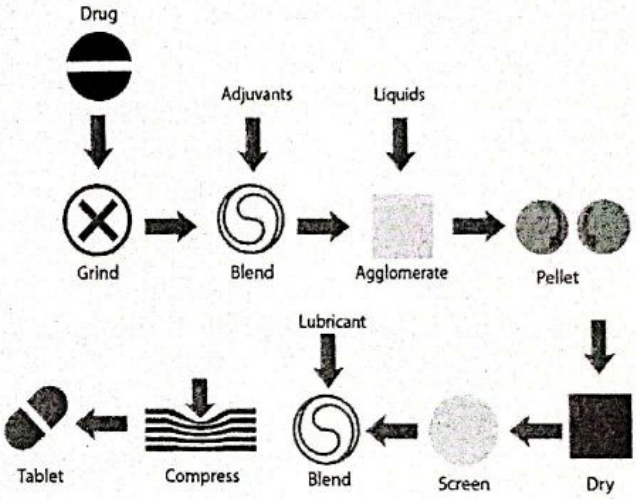
Generalized steps involved in this process are:



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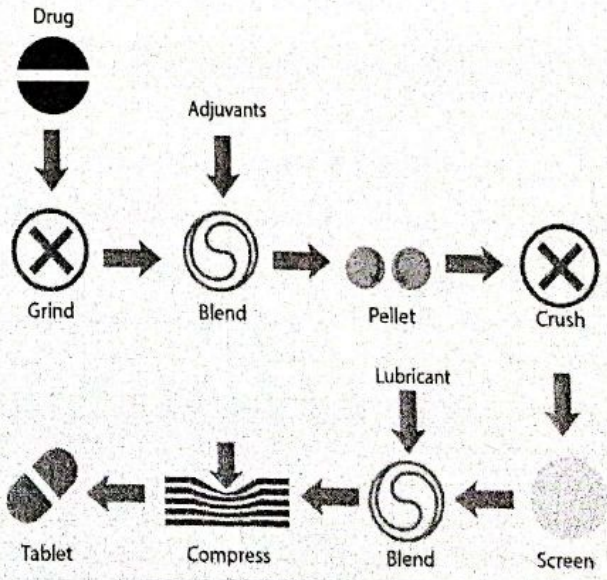
Manufacturing of tablets by wet granulation method

Wet granulation is a widely used method for the production of compressed tablets. It is essentially a process of size enlargement involving several steps and the use of an adhesive substance known as binder. The granules produced using this method of granulation has a greater probability of meeting all the physical requirements for tablet formation.



Manufacturing of tablets by dry granulation method

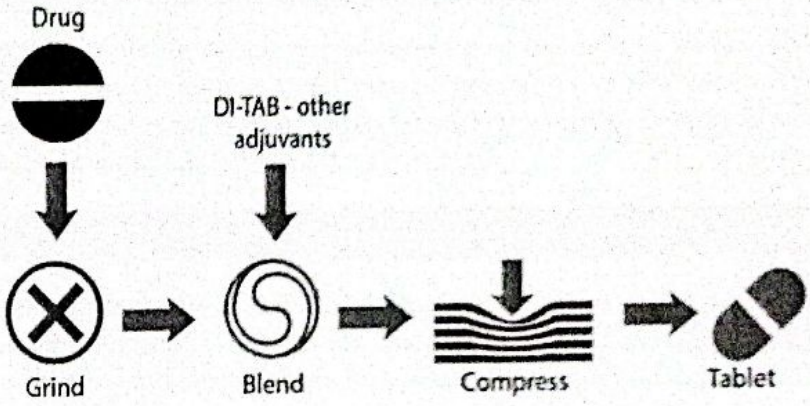
The formation of granules by compacting powder mixtures into large pieces or compacts which are subsequently broken down or sized into granules (often referred to as dry granulation, double compression, or pre-compression) is a possible granulation method which, however, is not widely used in the manufacture of tablets. This method is used when tablet excipients have sufficient inherent binding properties. The procedure can also be used as a means to avoid exposure of drug substances to elevated temperatures (during drying) or moisture.



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Manufacturing of tablets by direct compression method

As its name implies, direct compression involves direct compression of powdered materials into tablets without modifying the physical nature of the materials itself. The technology involved in this method assumes great importance in the tablet formulations, because it is often the cheapest means,



2.10.5 CAPSULE MANUFACTURING

Capsules are solid dosage forms in which one or more drug substance and/ or in materials are enclosed within a small shell. They are composed largely of gelatin and consist of two parts: the body designed to contain the drug and the diluents, and the cap that is approximately half as long as the body. Most capsule products manufactured today are of the hard gelatin type. It is estimated that the utilization of hard gelatin capsules to prepare solid dosage forms exceeds that of soft gelatin capsules by about 10-fold. The method for manufacturing hard gelatin capsules is as below:

Step 1: Preparation of the gelatin solution (dipping solution)

A concentrated solution of gelatin is prepared by dissolving the gelatin in demineralized water which has been heated to 60-70°C in jacketed pressure vessels. This solution contains 30–40% w / w of gelatin. The gelatin solution is then transferred to temperature-controlled tanks on the dipping machine where it is fed continuously into the dipping dishes.

Step 2: Dip-coating the gelatin solution on to metal pins (moulds)

Capsule shells are manufactured under strict climatic conditions by dipping pairs (body and cap) of standardized steel pins arranged in rows on metal bars into an

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aqueous gelatin solution (25–30%w / w) maintained at about 50°C in a jacketed heating pan. Because the moulds are below the gelling temperature, the gelatin begins to form a thin gelatin layer or film on the moulds. The rows of pins are arranged so that caps are formed on one side of the machine while bodies are simultaneously formed on the opposite side of the machine.

Step 3: Rotation of the dip-coated pins

Following adsorption of the gelatin solution on to the surface of the pins, the bars containing the pins is removed and rotated several times to evenly distribute the solution around the pins, correct gelatin distribution being critical to uniform and precise capsule wall thickness and dome strength.

Step 4: Drying of the gelatin-coated pins

Once the gelatin is evenly distributed on the mould, a blast of cool air is used to set the gelatin on the mould. At this point, the gelatin is dried. and the pins are then passed through several drying stages to achieve the target moisture content.

Step 5: Stripping and trimming

After the gelatin is dried, the capsule is stripped off the mould and trimmed to the proper length.

Step 6: Joining of the trimmed capsule shell

Once trimmed, the two halves (the cap and body) are joined to the pre-closed position using a pre-lock mechanism. At this point, printing is done if needed before packing in cartons for shipping.

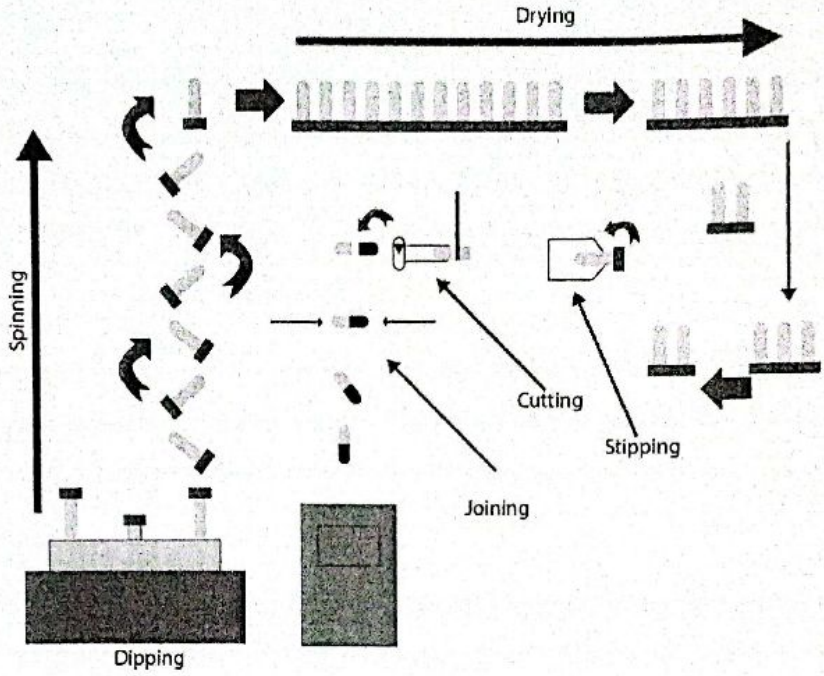
Step 7: Printing

After formation, the capsule shells can be printed to improve identification.

Printing can be achieved using one or two colors, containing information such as product name or code number, manufacturer's name or logo and dosage details.

Printing reduces the risk of product confusion by the numerous handlers and users of the product including manufacturers, pharmacists, nurses, doctors, caregivers, and patients.

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2.1.1 List of machinery

A list of machinery provided in Don Valley Pharma is attached as annexure.

2.1.2 Manpower (Direct & Indirect)

The Project requires manpower during both the construction and operational phases. During the construction phase 60-70 workers were involved. During the operation phase of the project, the total manpower requirement is estimated to be 80-100 people (Both Direct & Indirect) comprising administrative, technical, and non-technical persons. These include pharmacists, chemists, computer operators, accountants, administrative assistants, secretaries, etc. All recruited staff will be given appropriate training in order to educate the month specific job tasks to be performed.

2.1.3 Firefighting, evacuation plan, Health & Safety and HVAC plan

The fire-fighting system includes water and gas devices / extinguishers. Plant has established a proper fire-fighting system. Indoor and outdoor fire hydrants are installed according to the codes and standards.

A proper evacuation plan is formulated to cope with any emergency situation. Assembly points are set and marked. Fire frightening and emergency plan is annexed.

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2.1.4 Electricity

WAPDA will be the main source of electricity for this pharmaceutical unit. A stand-by generator will provide electricity for this Unit in load-shedding conditions. One stand-by diesel fired generator of capacity 200kva, is also provided in unit.

2.1.5 Water supply

The water requirement for the project includes drinking water, Process water and water for fire hydrants. Ground water supply is used to fulfill this demand. Water treatment plant is provided for quality medicines (design is annexed).

2.1.6 WASTE WATER

Wastewater will be disposed of in Tehsil Council Drain after proper treatment through activated sludge process for which treatment plant. Municipal wastewater coming from various municipal works, such as cleaning will be generated, which will be treated via a Septic Tank. Process-flow diagram of WWTP is attached as an annexure.

2.1.7 AIR EMISSIONS

No air emission is likely to be released during operation of the project, except the dust or PM to be produced during floor cleaning and other such operations, which also will not be posing any environmental threat (will not breach the safe standards). Wet suppression is done to control dust emissions. Generator emissions will be controlled by providing proper enclosure, tuning and maintenance. Boiler is natural gas fired.

2.1.8 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.

2.1.9 SOLID WASTE

No process waste is generated as the whole project will be carried out in closed tanks, while domestic waste is handled as per area practices. For collection of solid waste dust bins are kept in the unit premises to manage the waste. Discarded/

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Rejected material will be sent back to supplier.

2.1.10 AREA

Total area of plot is 55 Kanals:

Table 4: Building Areas Distribution

Sr. No	Section	Area (SqFt)
1.	Total Area of Plot	55 Kanals 14 Marlas
2.	Total Covered Area of Plot	
Covered Building Area		
2.	Tablet Section (General)	
3.	Capsule Section (General)	
4.	Sachet Section (General)	
5.	Cream Ointment (General)	
6.	Dry Suspension (General)	
7.	Syrup Section	
8.	Ampoule & Vail (General)	
9.	Capsule Section (CEPH)	
10.	Dry Suspensions (CEPH)	
11.	Inject-able CEPH	
12.	Inject-able Steroidal	
13.	Stores	
14.	Quality Control	

2.1.11 COST AND MAGNITUDE OF OPERATION

Raw Material, Operation and maintenance of the Production machinery are the costly activities involved in the operation phase of the project. Equipment safety will be assured if these operations are carefully managed. No separate fund allocation is required. However, budget will be allocated for purchase and maintenance of standardized PPEs for workers and for waste management and environmental enhancement. Despite these costs, this project was found to be financially feasible in

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the feasibility report. Magnitude of operations includes:

1. Applying for and getting all necessary approvals and contracts
2. Construction of boundary wall and other structures
3. Installation of machinery
4. Installation of fire-fighting equipment
5. Marking of emergency exits, assembly points.
6. Tree plantation and landscaping

2.1.12 SCHEDULE OF IMPLEMENTATION

The project construction intends to take 6 months from start to completion.

Sr.#	Activities	6Months			6Months			6Months			6Months		
		2M	2M	2M	2M	2M	2M	2M	2M	2M	2M	2M	2M
1.	Detailed Designing												
2.	Mobilization of Contractors												
3.	Lean Construction Period												
4.	Peak Construction Period												
6.	Installation of machinery												
7.	Installation of firefighting Equipment & emergency exits												

M=Month

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3 CHAPTER 3: DESCRIPTION OF THE ENVIRONMENT

3.1 GENERAL

This Section of the report covers a comprehensive description of the baseline conditions of the project and its related influential area with respect to the physical, biological, and social aspects. In addition to the secondary data, the field survey was carried out and the environmental baseline conditions were established based on socio-economic interviews, impact location profiles, environmental profile questionnaires and public consultations. A social survey was carried-out through consultation with various communities. Interviews were conducted with the locals near the project area. The main intention of these interviews was to acquire feedback associated with the project as well as its impacts on their daily life on short term as well as long term basis.

3.2 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 the physical environment of city and the project area is present in the following subsections.

3.2.1 Soil Types

Topographically speaking, Kasur District lies between the river Satluj which flows along its boundaries with India and river Ravi which flows its boundary with Nankana Sahib District. The districts may be divided into two parts, a low lying or riverine area along the two bordering rivers and upland, away from the rivers. The riverine area generally inundates during monsoon season. The water level in this area is higher than in the upland. The soil is sandy. The upland is flat plains sloping from north-west to south-west. The general height of the area is from 150 to 200 meters above the sea level.

3.2.2 Seismicity Data

Earthquakes in non-cohesive soil may cause serious problems. In extreme cases liquefaction can occur if Relative density is low Initial confining pressure

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(overburden) is low Earthquake intensity is high Duration of ground shaking is long National Seismic Monitoring Centre of Pakistan issued the seismic zone map for Pakistan, as shown in Figure below. Said Project area falls in low hazard area and low risk associated with the infrastructure found in this area.

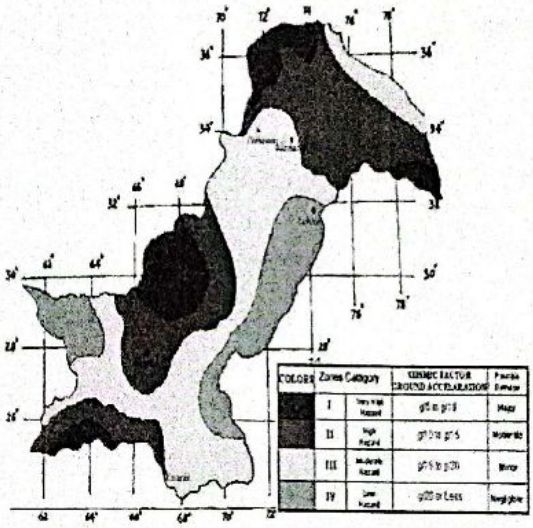
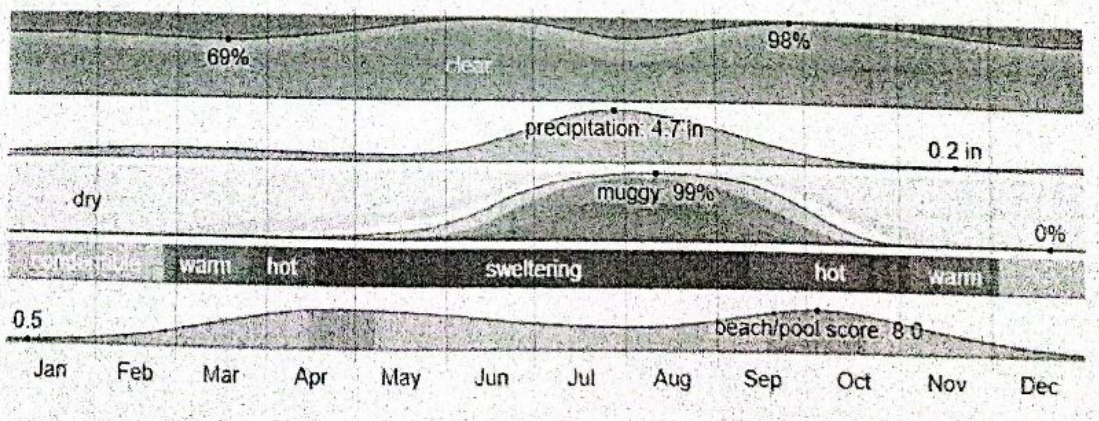


Figure 8: Seismic Zoning of Pakistan

3.2.3 CLIMATE

In Kasūr, the summers are short, sweltering, humid, and clear and the winters are short, cool, dry, and mostly clear. Over the course of the year, the temperature typically varies from *41°F* to *105°F* and is rarely below *36°F* or above *112°F*. Based on the beach/pool score, the best times of year to visit Kasūr for hot-weather activities are from *mid-April* to *early May* and from *mid-September* to *mid-October*.

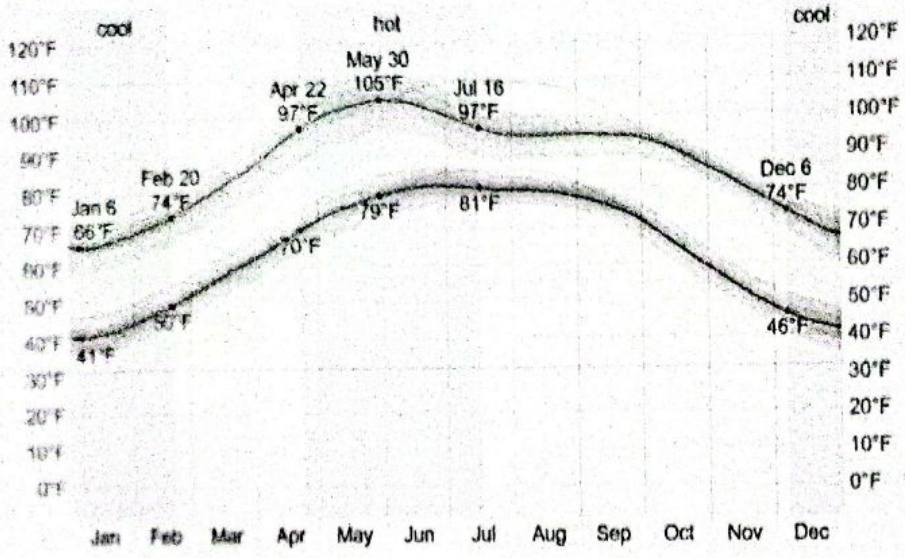


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Average Temperature in Kasūr

The *hot season* lasts for *2.8 months*, from *April 22* to *July 16*, with an average daily high temperature above *97°F*. The hottest month of the year in Kasūr is *June*, with an average high of *103°F* and low of *81°F*.

The *cool season* lasts for *2.4 months*, from *December 6* to *February 20*, with an average daily high temperature below *74°F*. The coldest month of the year in Kasūr is *January*, with an average low of *42°F* and high of *67°F*.

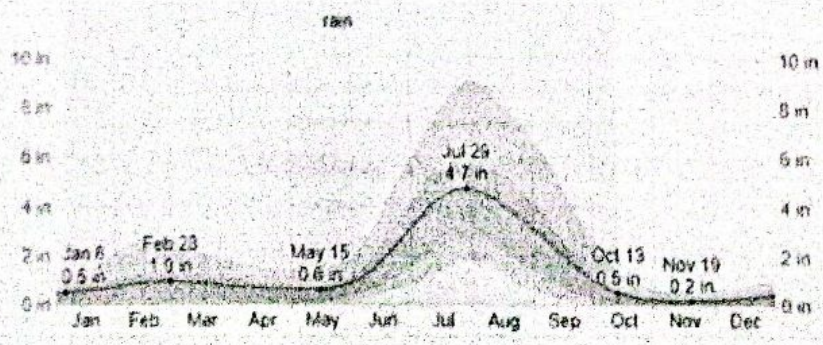


Rain Fall

To show variation within the months and not just the monthly totals, we show the rainfall accumulated over a sliding 31-day period centered around each day of the year, Kasūr experiences ***extreme*** seasonal variation in monthly rainfall.

The *rainy* period of the year lasts for *9.2 months*, from *January 6* to *October 13*, with a sliding 31-day rainfall of at least *0.5 inches*. The month with the most rain in Kasūr is *July*, with an average rainfall of *4.4 inches*.

The *rainless* period of the year lasts for *2.8 months*, from *October 13* to *January 6*. The month with the least rain in Kasūr is *November*, with an average rainfall of *0.2 inches*.



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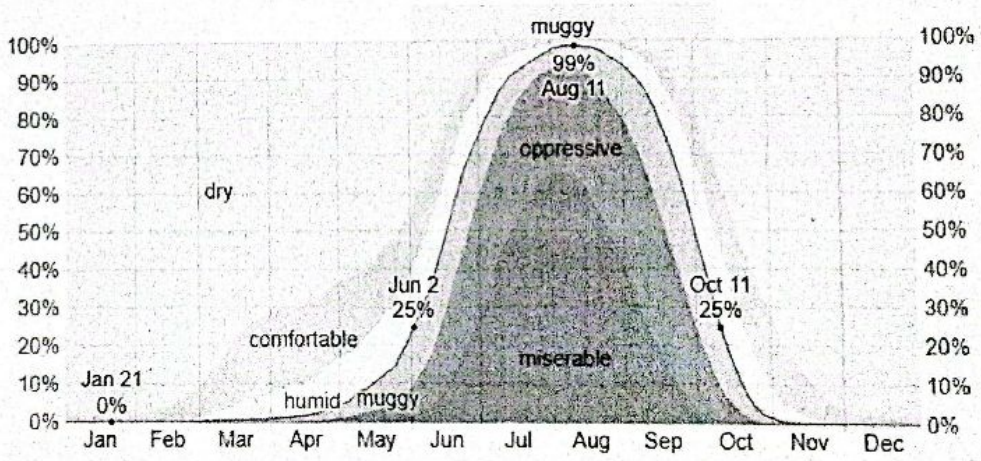
3.2.4 Humidity

We base the humidity comfort level on the dew point, as it determines whether perspiration will evaporate from the skin, thereby cooling the body. Lower dew points feel drier and higher dew points feel more humid. Unlike temperature, which typically varies significantly between night and day, dew point tends to change more slowly, so while the temperature may drop at night, a muggy day is typically followed by a muggy night.

Kasūr experiences *extreme* seasonal variation in the perceived humidity.

The *muggier period* of the year lasts for *4.3 months*, from *June 2* to *October 11*, during which time the comfort level is *muggy*, *oppressive*, or *miserable* at least *25%* of the time. The month with the most *muggy days* in Kasūr is *August*, with *30.2 days* that are *muggy* or worse.

The month with the fewest *muggy days* in Kasūr is *January*, with *0.0 days* that are *muggy* or worse.



3.2.5 AMBIENT AIR QUALITY

Ambient air quality was monitored at site by HSE Services lab and results are annexed as annexure-V.

3.2.6 NOISE

Noise level observed at project site was within PEQs limits. Results are annexed.

3.3 BIOLOGICAL ENVIRONMENT

3.3.1 Flora:

Flora of the district has been greatly modified by human agency of the old open forests of

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small trees and shrubs; there remains only a few Rakhs or portions of forest which are kept as gazing ground for cattle etc. Amongst trees the most important are Kikar (Acacia arabica), Shisham or Tahli (Dalbergia sissoo), Beri (Zizyphus jajaba), Toot (Morus marlaccae), Sharin (Albizzia lebbek), Dharek (Malia azerdaracb), Phulahi (Acacia modesta), and Nim (Melia indica), Piple (Ficus indica) are planted for shade. The growth in Rakhs is composed mainly of three kinds of trees Jand (Prosopis spicigera), Karril (Capparis aphylla), and van or Jal (Salvadora obeoides). Occasionally pelu (acacia Loucophhloea) and Farash (Tamarix articulate) are also found. Pilchi (Tamarix gallio) is found on moist sandy soil along the rivers and is used for wickerwork, basket making etc.

3.3.2 Fauna

Wolf and jackal are the only wild animals of any importance. The former being met with occasionally in the low land wastes of Chunian Tehsil but jackal are found everywhere. Changa Manga reserve a thick forest is the only area in which a few Nelgai, pig, peafowl and here are found.

Reference: IEE of Punjab Irrigated Agriculture Investment Program, Tranche 3 Pakpattan Canal and Suleimanki Barrage Improvement Project, August2012.

3.3.3 Protected areas / National Sanctuaries

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

3.4 SOCIO-ECONOMIC ENVIRONMENT

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

3.4.1 Socio-Economic Environment

3.4.2 Industries

The Most famous industries lying in this area include Cotton and Textile, Beverages, flour & Cottage Industries, automobiles industry, pipe industries are

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the most important industries playing fundamental role in the economy of the area.

Industries nearby site are:

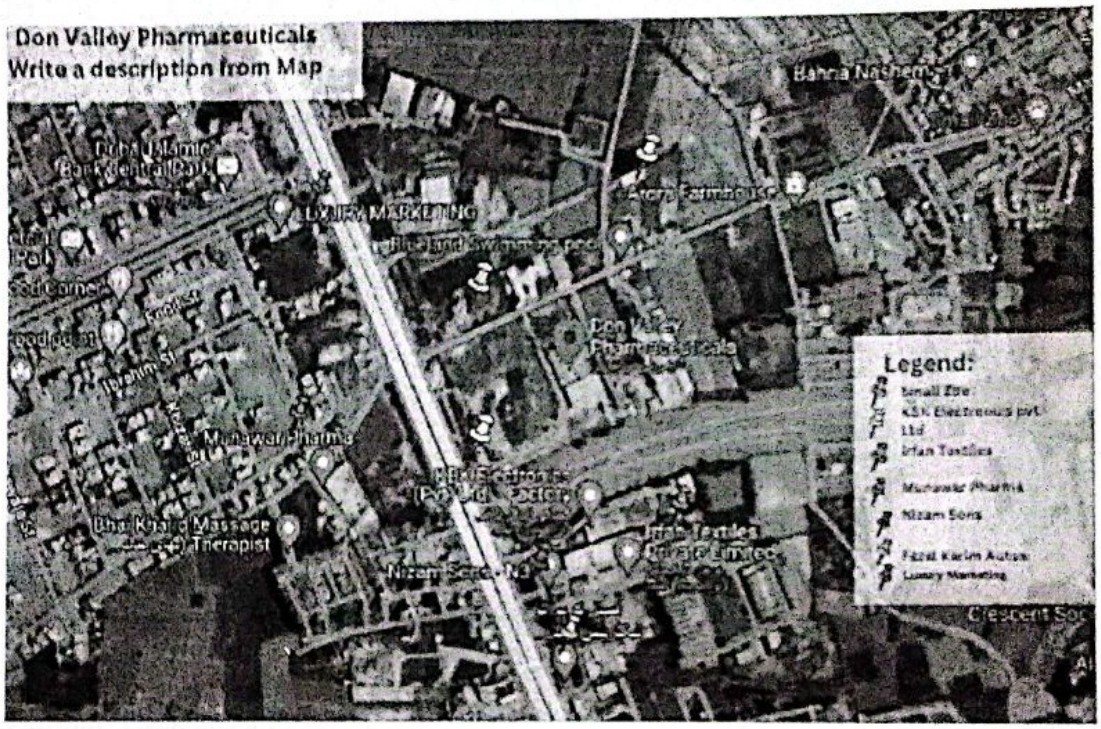


Figure 9: Industries nearby site

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3.4.3 Educational facilities

Educational facilities nearby project site are:

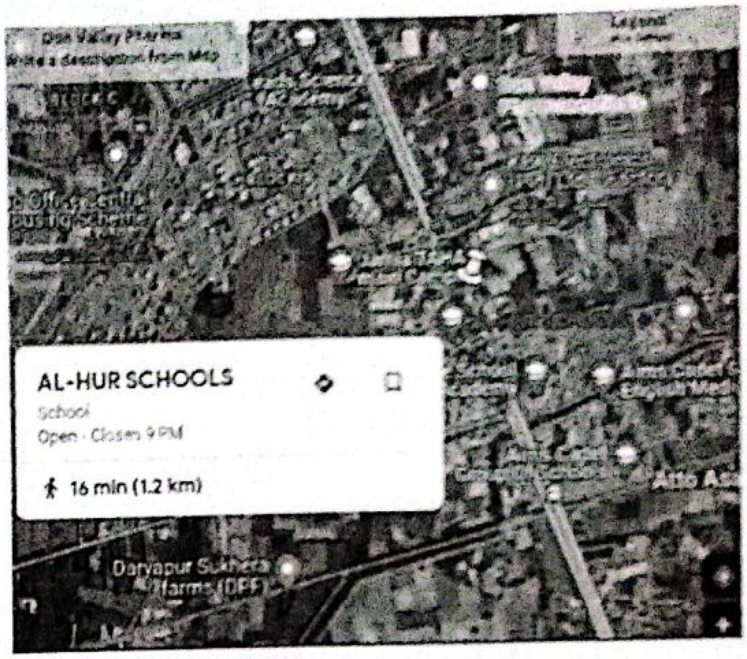


Figure 10: Schools nearby site

3.4.4 Health facilities

Nearest hospital from the project site

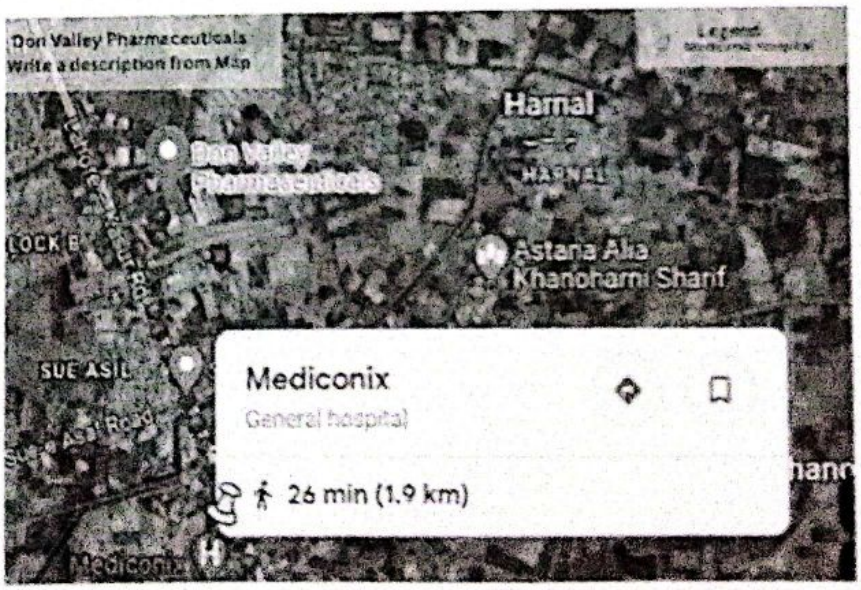


Figure 11: Hospital nearby site

3.5 QUALITY OF LIFE VALUES

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Socio-Economic Questionnaire and Environmental Checklist were used as survey tools by the Exodus Green to collect desired information. Graphical representation of results of Socio-Economic Survey is given below:

3.5.1 Occupation of Respondents

Majority of the respondents (70%) are attached with jobs, 15% shopkeepers and remaining 15% are labors. During the survey, efforts were made to interact with people representing all walks of life. The detailed graphic representation of occupational status is given below:

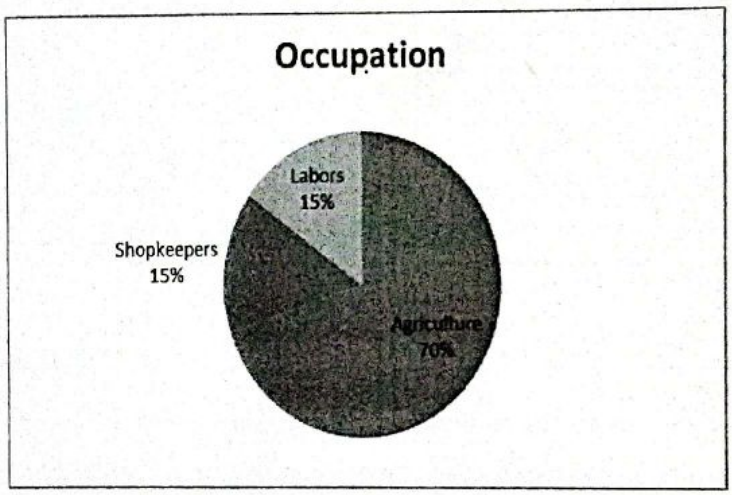


Figure 12: Occupation of Respondents

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3.5.2 Literacy Rate

From survey results, it was found that 75 % of the studied population was illiterate, 15% was up to primary level, 10% studied up to middle level.

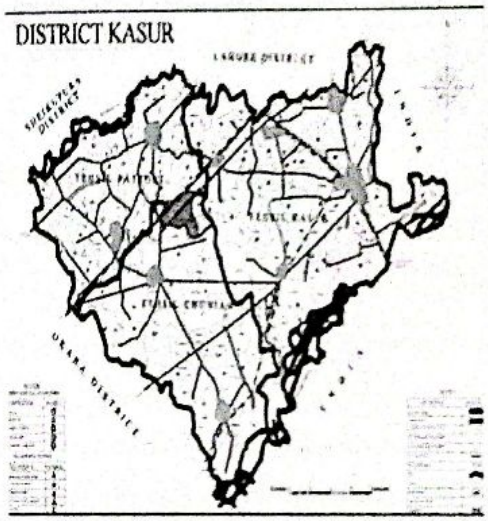


Figure 13: Literacy Rate

3.5.3 Common Diseases

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

3.5.4 Livestock

People in the study area have common livestock which include Cows, Buffalos, Sheep, Goats and Hens. However, there is no proper cattle or poultry farm observed within the study area.

3.6 LAB REPORTS OF ENVIRONMENTAL ANALYSIS

Testing of different parameters was done by HSE Services 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 V.

3.7 SUITIBILITY OF SITE

Said project is the Establishment of M/S Don Valley Pharma (Pvt.) Ltd. Selected site is surrounded by other industries and no other alternative site is considered for Said Project. The site is well located in regard to the following:

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- Within vicinity of existing unit
- Plot near other industries
- Easy road access to the market
- No settlements in close vicinity
- No water course within a safe distance
- No ecologically sensitive or declared protected area within safe radius 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.

Considering the facts that said site is at a safe distance from sensitive receptors. The said site has the advantage of not only to be environment-friendly but also potentially sound to enhance sustainable development in the region. Therefore, the given site is the most suitable for establishment of said project.

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4 CHAPTER 4: STAKEHOLDER CONSULTATION

4.1 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. According to the IEE and EIA Review Regulations, public consultation is mandatory for any socio-environmental study.

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 lifestyles 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. Public consultation Performa is attached as Annex-VIII of this EIA Report.

4.2 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 all stakeholders. Referring particularly to a project related to environmental assessment, involvement of the public is all the more

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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, which have been presumed to arise and to identify those which are not known or are specific to the project. In fact, discourse with many who have thoroughly observed the site conditions in the pre-developmental phase goes a long way in updating the knowledge and understanding.

4.3 IDENTIFICATION OF STAKEHOLDERS

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

Project stakeholders include the settled families, either property owners or the tenants, businessmen (landowners, traders, shopkeepers, vendors, transporters, restaurant owners etc.), employees of the commercial entities. PAPs are of two types, for instance:

4.3.1 Direct

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

4.3.2 Indirect

Indirect impact will occur on those who are living or doing business within the 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

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4.4 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 of before the proponent applies for NOC to the EPA; this disclosure will be distributed properly among all stakeholders. It is the responsibility of the proponent and the consultants to display public disclosure document at prominent places where the community has easy access.

4.5 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 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

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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.

4.5.1 Consultation Methodology

The methodology adopted for consultations is summarized below.

4.5.1.1 Consultation Material

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

4.5.1.2 Consultation Mechanism

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

By reaching out to a wider segment of the population and using various communication tools such as participatory needs assessment, community consultation meetings, focus group discussions, in-depth interviews, and participatory rural appraisal EIA involved the community in active decision-making. This process will continue even after this EIA has been submitted, as well as during future EIA in which similar tools will be used to create consensus among stakeholders on specific environmental and social issues.

Secondary stakeholder consultations were more formal as they involved government representatives and local organizations, consulted during face-to-face meetings. They were briefed on the EIA process, the project design, and the potential negative and

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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 leaders or local administrators. The issues recorded in the consultation process were examined, validated, and addressed in the EIA report.

4.5.2 Primary Stakeholders Consultation

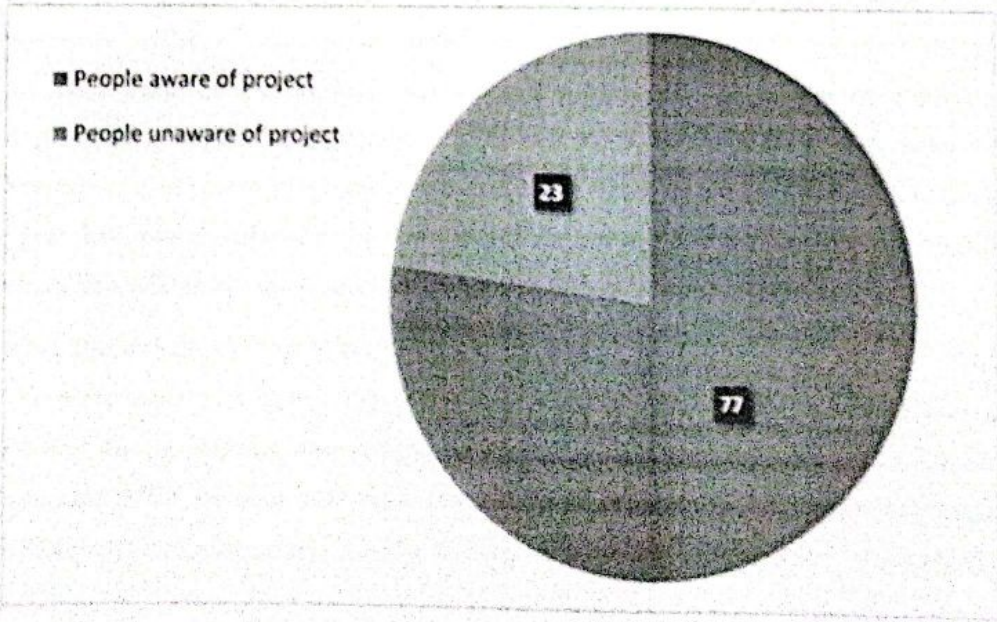
Community consultations were conducted with the community members outside their settlements to encourage and facilitate their participation. Consultation was done for 1 day.

4.5.2.1 Stakeholder Concerns and Recommendations

The finding of the community consultation has been addressed in various sections of EIA. Mitigation plan has been incorporated into EMP. The summary of consultation with various stake holders is given below:

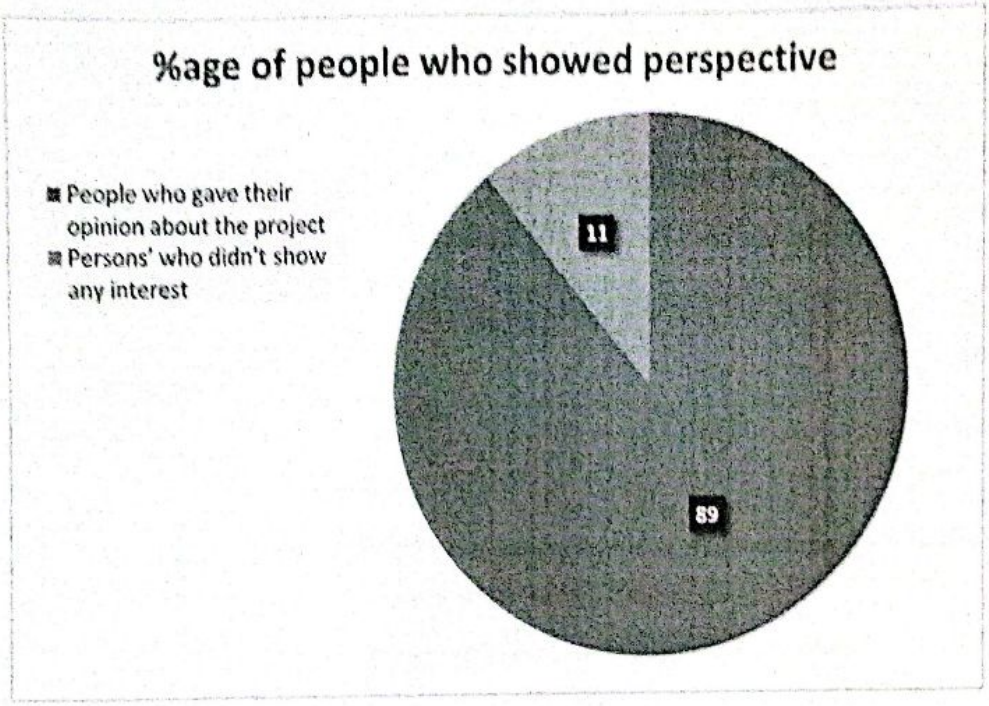
Out of total respondents of 77% knew about the project whereas 23% were not aware of the project planning and implementation. All people were then briefed about the project.

Awareness regarding project



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



Out of 89%, majority of the people (about 94%) favored the construction of the project keeping in view its importance and 6% people showed pessimistic views in general but mitigation measures and solutions to their concerns were provided.

Majority of people were in favor of the project. They said that the project will result not only indirect jobs opportunities for locals but also will enhance subsidiary business, trade, education, 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 an increase in GDP.

4.6 ENVIRONMENT MANAGEMENT TEAM

The Proponent will utilize the following arrangements in the implementation of the EMMP during planning and design, construction, and operation phase. The Proponent is accountable for ensuring that resources are made available to effectively implement the EMMP and necessary environmental management measures arising from the project.

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Position	Responsibility
Project Manager	Supervising construction works. Schedule preparation and resource forecasting for engineering and other technical activities relating to the project. Effective implementation of the EMMP Regular performance reviews Corrective and/or remedial action where this may be required.
Contractor	Undertake development of facility in accordance with contract signed with the Proponent. Adhere to Proponent HSE policies, procedures and other requirements while undertaking the Project. Implement aspects of EMMP assigned to them.
HSE Executive	Preparation of environmental monitoring, reporting, and any permit applications (if any) Overseeing of construction processand ensuring the implementation of avoidance and mitigation measures Conducting monitoring and review of EMMP implementation by contractor Inspect the constructed facility after completion.

4.6.1 Secondary Stakeholders Consultation

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

1 District Office Environment, Kasur

2 Livestock Department

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

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Table 5: List of consulted stakeholders

S#	Participant	Designation	Concerns/Remarks
Responsible Authority			
1	Mr. Abbas	Inspector Environment	• EHS plan should be enforced strictly. • Proponent should install proper wastewater treatment plant. • Should work for local people benefit. • Preventive measures should be adopted to avoid any unfortunate incident. • Environmental enhancement measures such as Tree plantation, monitoring and safety should be ensured
Departments and Agencies			
Livestock Department			
1	Dr. Muhammad Sohail Khan	Assistant Director Livestock	• He said that as per market response the standard and quality of the medicines manufactured by the company are satisfactory. • Said plant will provide jobs to local communities. • Project will lead to community development. • Will raise living standard. • He also expressed that local people should be first preference for jobs and CSR works.
Proponent Environment Management Team			
1	Proponent Environment Management Team	Proponent Environment Management Team	• Local employment will be ensured. • Tree plantation will be done to make project environment friendly. • Wastewater treatment plant has been installed. • No waste will be dumped improperly.
Environmental Practitioners and Experts			
1	Dr. Muhammad Faqir Irfan	PhD. Environment Lawyer	• To avoid violation of section11 Waste Water Treatment Plant should be installed
Affected and Wider Community			
1	Mr. Khurram	NGO (Parho Barho Punjab)	• Local employment should be ensured. • Proponent shall work for betterment of community

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5 CHAPTER 5: POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

5.1 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.

5.2 IDENTIFICATIONOFPOTENTIALIMPACTS

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. Potential impacts are also identified through discussion with project proponent, consultation with stakeholder and community to identify their concerns. 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

5.3 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

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Air Quality	Ambient air quality
Water Resources	Ground and surface water resources
Ecosystem	Vegetation, wildlife, and biodiversity

5.4 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 is 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 the particular project activity?
- Did the community express any concern about this aspect?

5.5 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: 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

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Table 7: Impact Significance Matrix

		Likelihood (Probability of occurrence)		
		High	Medium	Low
Impact (Consequence)	High			Medium
	Medium		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 8: Impact Assessment Criteria

Impact Characteristics	Categories
Nature of the Impact	Direct: The environmental parameter is directly changed by the project. Indirect: The environmental parameter is changed as a result of alteration in another parameter.
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 are captor resumes its pre-project condition. Irreversible: When are captor cannot resume its pre-project condition.

5.5.1 What is the problem?

The project is about pharmaceutical industry, namely "Don Valley Pharma." The major impact as sociated with the construction and operation of pharmaceutical industry includes solid waste management, wastewater management, noise emissions, tree plantation and fire-fighting arrangements.

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

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

5.5.3 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.

5.5.4 How the problem should be addressed?

Proper mitigation measures will be provided according to the nature of the impacts/problems.

5.5.5 Ways of Achieving Mitigation Measures:

Following ways will be adopted to reduce the impacts of the proposed development:

5.5.5.1 Changing in Planning Design

The design of the pharma industry is developed considering environmental risk and hazards. Moreover, there are no endangered and threatened species present in the project area. No human settlement or infrastructure was dislocated or dismantled due to the project development. Hence, there is no need to change the design of the project.

5.5.5.2 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. Following practices that need to be adopted to reduce the impact significantly:

5.5.5.3 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 monetary /'l/terms is required.

5.5.5.4 Replacement/Relocation/Rehabilitation

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

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5.6 IMPACT ASSESSMENT

Evaluation of impacts signifies the potential impacts in terms of its likelihood nature as per the following criteria:

- The impacts are further classified based on their spatial distribution, i.e. *local,* when impacting an area of approximately 1 km radius from the project area, *moderate spread,* when impacting an area of 1 to 2 km radius and *regional* beyond 2km.
- The impacts are classified as *short term, moderate term,* and *long term* in terms of their existence in temporal scale. Impacts less than 1 year existence as *short term,* while those with 1 to 3 years as *moderate term* and more than 3 years as *long term.*
- The negative impacts are termed as *adverse impacts* while positive impacts as *beneficial.*

The significance of environmental impacts of various involved activities has been evaluated based on the criteria outlined in Table 9.

Table 9: Impact Significance Criteria

Impact Significance	Criteria
Long term	When the impact is of high intensity with high spread and high duration
Moderate term	When the impact is of moderate intensity with high-moderate spread and high-moderate duration
Short term	When the impact is of low intensity but with moderate spread and moderate duration or of
Insignificant	When the impact is of low intensity, low spread, and low duration
Beneficial	When the impacts are positive

Based on the above-specified criteria, Matrix method has been used to describe potential environmental impacts due to project as shown in the Table below. It is important to note that one activity may have varying impacts on different receptors i.e., different components of the environment. To avoid repetitions, this section

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describes various activities, which may have wide impacts on many receptors.

For example, waste generation and disposal will have impacts on land, water bodies, odour nuisance etc., therefore, the impacts of waste generation and disposal have been considered as one of the key areas of impacts. Similarly, gaseous emissions may be adverse to air quality, which on exposure may impact upon health of individuals and ecology in the surroundings.

Table 10: Impact Screening Checklist (Construction Phase)

Environmental Sensitivities	**Nature of Likely Impacts**						**Impact Significance**				
	Low Intensity	Moderate Intensity	High Intensity	Local	Moderate Spread	Regional	Beneficial	insignificant	Short Term	Moderate	Long Term
Air Quality		☐		☐							
Noise	☐			☐							
Water Quality		☐			☐						
Land Environment			☐		☐						
Flora		☐		☐							
Fauna	☐			☐							
Local Economy			☐		☐						
Social Impacts			☐	☐							
Health & Safety		☐		☐							

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Table 11: Impact Screening Checklist (Operational Phase)

Environmental Sensitivities	Nature of Likely Impacts						Impact Significance				
	Low Intensity	Moderate Intensity	High Intensity	Local	Moderate Spread	Regional	Beneficial	insignificant	Short Term	Moderate	Long Term
Air Quality		☐			☐					■	
Noise		☐		☐							
Water Quality			☐		☐					■	
Land Environment	☐							■			
Flora	☐			☐				■			
Fauna	☐			☐				■			
Local Economy			☐		☐	■	■				
Social Impacts			☐	☐		■	■				
Health & Safety		☐		☐							

5.7 IMPACTS DUE TO PROJECT LOCATION

The said project site is located in an area surrounded by other industries. The project site is devoid of any forest; hence the site clearance from the Forest Department is not involved. Further, the project site is devoid of any human habitation hence evacuation of the project-affected persons is not involved in this project. Thus, no resettlement and rehabilitation issues are 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 the construction period and in the post construction phase. The topsoil will be spread on the unbuilt area of the plot and tree plantations and green belt development will be taken up. As the topsoil 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.

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5.8 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. Design of the said project will be adhered to all standard technical requirements to avoid adverse impacts on the environment and human health. Efficient infrastructure will be developed. Procurement of construction materials from approved dealers will be ensured.

5.9 IMPACTS ASSOCIATED WITH CONSTRUCTION PHASE

This section explains how said project affected different environmental aspects and its mitigation measures to manage the impact. The impacts during construction phase will be temporary and localized. Even though, the proper mitigation measures will be followed to minimize such impacts.

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

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2	Air Quality	During construction phase, suspended particulate matter will be the main pollutants. 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. 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 sprinkling on roads for dust suppression, domestic uses of construction workers	During this phase, water conservation practices will be given proper consideration.
4	Relocation of Utilities	The project site is already near other industries. The construction will not relocate the existing public utilities.	No mitigation measure will be 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 approved contractors on weekly basis.

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6	Noise Pollution	During construction phase, the major sources of noise are 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 extension works will be done in daytime.
7	Ecology	The project site is located in an industrial agricultural zone. It is devoid of thick forest and vegetation.	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 have the potential to pose negative impact on the health and safety of workers in case of unfavorable working conditions.	The contractor will ensure 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 will be required on the basis of the nature of the work. First aid kits will be kept available on the site to ensure a safe working environment for the labors and workers. As per the requirement warning signs will be displayed in the local language. Proper fencing will be done around the site.

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5.10 IMPACTSASSOCIATEDWITHOPERATIONPHASE

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

1. Environmental Impacts
    - Air emissions
    - Noise
    - Traffic
    - Solid waste and by-products
    - Wastewater
    - Resource Consumption
    - Abnormal conditions
    - Occupational Health and Safety
2. Socio-economic Impacts
    - Employment Opportunity
    - Community Development

5.11 ENVIRONMENTAL IMPACTS

5.11.1 AIR EMISSIONS POTENTIAL IMPACTS

Air emissions from the project are relatively small. Particulate emissions are typically not significant. Fugitive dusts and emissions may result during raw material handling and storage which is relatively less likely to occur. Other potential sources for air emissions are combustion products (nitrogen oxides, sulfur dioxide, particulate matter, carbon monoxide) from stand by diesel generators and combustion products from vehicles used for project activities. The emissions from stand by generators 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 proposed operation activities are:

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- Clean and maintain a sufficient level of temperature and humidity in every section.
- Proper handling of raw material to minimize the likelihood of fugitive dust and emissions during storage.
- Monitoring of Ambient air parameters (Particulate matter, SOx, NOx) emissions should be carried out on a regular basis to ensure compliance with the PEQS.
- 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.

5.11.2 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. The increased noise may be a source of disturbance to workers, working near to the machines. Noise level during operation phase of pharmaceutical unit will be limited to operational site. Workers could be exposed to high noise levels, however only concerned staff will be working in the area with the required personal protective equipment (PPE) to minimize or reduce the noise exposure. The residential area is located at a distance of more than 1.5 km away from the project site and there will be no significant impact on the community.

MITIGATION MEASURES

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

- 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.
- It will be ensured that generators, vehicles, and other potentially noisy equipment are in good condition. Noise from generators, vehicles, other equipment, and machinery will be kept to the minimum through regular maintenance.
- Noise monitoring will be carried out periodically.

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RESIDUAL IMPACTS

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

5.11.3 TRAFFIC

The operational phase of the pharmaceutical 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.
- Community complaint register and other means will be adopted for the community to complain about non-adherence of traffic to speed limits, safe driving, and other safety related concerns.
- 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.

5.11.4 SOLID WASTE

Solid waste generated from a pharmaceutical unit comprises of raw materials packaging waste like cartons, material bags, finished goods packaging waste etc. Most of the generated waste will be recyclable. The rejected raw material will be handed back to the supplier. The generated domestic solid waste will be handled as per area practices. If the waste management is not carried out properly, it can affect the health of workers, pollution of soil, surface, or ground water. All waste generated from the project will be managed by proposed controls. The environmental impacts will be minimized after the implementation of the proposed mitigations.

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MITIGATION MEASURES

The following mitigation measures will be implemented:

GENERAL WASTE MANAGEMENT PRACTICES

During the operational phase of the project, a proper waste management plan will be devised and implemented. Key elements of the waste management system will include the following:

ON-SITE HANDLING

- A 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.
- All non-hazardous waste that can be recycled or reused will be handed over to the contractors.

OTHER MANAGEMENT MEASURES

- Training will be provided to personnel for identification, segregation, and management of waste.
- All containers of waste will be labeled properly.
- In-house audits of waste management will be undertaken on a regular basis.

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.

5.11.5 WASTEWATER

Wastewater will be disposed of in Tehsil Council Drain after proper treatment through activated sludge process for which treatment plant has already been installed. Municipal wastewater coming from various municipal works, such as cleaning will be generated, which will be treated via a Septic Tank. Process flow diagram of WWTP is attached as annexure.

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RESIDUAL IMPACTS

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

5.11.6 ABNORMAL CONDITIONS

Abnormal events might include loss of power and fire outbreak. The pharmaceutical unit will have its own backup power supply using a diesel generator to protect against a loss of power. The facility will be equipped with a proper firefighting and emergency evacuation plan to tackle in case of any fire outbreak.

5.11.7 OCCUPATIONAL HEALTH AND SAFETY

This section discusses the occupational health and safety impacts of the operation of pharmaceutical unit. Physical hazards may include exposure to same-level fall hazards due to slippery conditions especially during cleaning of syrup tanks. In a variety of situations, a worker can be exposed to lifting, carrying, and repetitive work and work posture injuries.

MITIGATION MEASURES

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

- Proper training will be provided for the proper usage of machineries and personal protective equipment (PPE) will be provided. It will be ensured that the individual who has received the correct training is operating a particular machine.
- Regular housekeeping practices will be ensured by keeping the floor dry and during washing; proper protective equipment is being used. Restricted entry should be ensured during washing.
- Training of staff in the handling of lifting materials.
- Timely maintenance and repair of electrical equipment will be conducted.
- Implementation of work rotations, provision of regular work breaks.
- At the workplace, first aid facilities will be maintained at readily accessible places.

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5.12 SOCIO-ECONOMIC IMPACTS

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

Table 12: Potential Socio-economic 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 on the 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.
- It will be ensured that generators, vehicles, and other potentially noisy equipment used are in good condition. Noise from generators, vehicles, and other equipment will be kept to the minimum through regular maintenance.
- Maximum number of unskilled and semi-skilled jobs will be reserved for the local communities.

EMPLOYMENT OPPORTUNITIES

The project is expected to have a positive impact on the economic condition of locals. Employment opportunities will be generated due to said project activities. The project will generate approximately 80-100 jobs during the operation phase of the project.

Similarly, the operation of the project will create a 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.

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

5.13 POTENTIAL ENVIRONMENTAL ENHANCEMENT MEASURES GREEN BELT 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 helps in achieving biodiversity by providing possible habitats for birds and animals.
- Green belts increase the aesthetic value of the site.

Adequate number of small plants and trees are planted along the periphery of the unit and available open spaces.

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6 CHAPTER 6: ENVIRONMENTAL MANGEMENT AND MONITORING PLANTS

6.1 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. Even after implementation of the suggested mitigation measures, the impact may remain significant, and require regular monitoring. This sectional sounder lies 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 avvidence of significant criteria, requirements or goals are found.

6.2 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.
- Provide a mechanism for taking timely action in the face of unanticipated environmental situations.
- Identify training requirements at various levels.

6.3 MANAGEMENT APPROACH

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

Proponent: The project proponent will undertake overall responsibility for compliance with the EMP. Concerned Departments will carry out verification checks to ensure that the contractors are effectively implementing their environmental and

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social requirements.

Contractors: The contractors will implement the majority of environmental and social mitigation measures. The contractors will carry out field activities as part of the project. The contractors are subject to certain liabilities under the environmental laws of the country, and under its contract with the proponent.

6.4 COMPONENTSOFTHEEMP

The EMP consists of the following:

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

6.5 ENVIRONMENT MANAGEMENT PLAN (Project Specific)

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

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Table 13: Environmental Management Plan /Proposed Mitigation Actions

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 construction activities	Indirect opportunities
Safety during construction				
To ensure safety on construction site	• Safety signage will be put in relevant places within the construction site. • Construction drivers are subjected to public safety awareness. • Reckless driving by construction workers will be prohibited and monitored. • Workers will be given PPEs such as helmets, mask, earplugs/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.	Contractor/Environmental manager/EHS manager	On commencement of construction activities	Safety of workers will be ensured by implementing proposed mitigation measures

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Construction waste management				
To prevent the contamination of soils and water resources due to inappropriate management and disposal of waste	• The construction-site has litter bins for waste collection. • 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. • 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.	Contractor	Throughout construction stage	Waste will be disposed of/reused/recycle or resale as per practices of area

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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.	Contractor	On-site establishment	Potential for accidental release of materials during transport and handling on the site will be minimized.
To manage sewage	Portable toilets will be used	Contractor	On commencement of construction	
Protection of biodiversity				
To avoid unnecessary disturbance of and quick recovery of biodiversity in the plant site	• Avoid destruction of biodiversity outside the designated factory construction site • Minimize clearing of vegetation during construction. • Surface soil excavated during construction to be placed back on the sub-soil to fast vegetation recovery. • Prepare and implement an appropriate landscaping program to help in revegetation of affected project areas after construction. • The flora of the site will be restored at the end of the construction phase by landscaping and planting native vegetation.	Contactor	Throughout construction phase	Vegetation loss cannot be avoided, but successful restoration, improvement and long-term management of the surrounding areas and maintenance of planted trees will be provided

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Air quality & dust management				
To minimize the dust entrainment during construction	• Regular surface wetting will be implemented on dusty sections in the factory construction site. • 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. • 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.	Contractor	On commencement of construction activities	Dust propagation was limited to construction area and did not influence local community. However, workers will be supplied with dust masks especially on dry days.
To minimize disturbance due to noise	• Loading and unloading of materials will be done carefully to reduce noise disturbances to surrounding households. • Residences are at a safe distance from site, so no disturbance is 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.	Contractor	On commencement of construction activities	Noise level will be within PEQs

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Occupational health & safety				
To ensure healthy and Secure/safe environment in the construction site for all workers	• Management will ensure that fire extinguishers are located in strategic and visible places. • 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.	Contractor	Throughout construction phase	Record of all incidents will be maintained and reported to EHS manager.
Operation phase				
Wastewater management				
Degradation	Wastewater will be disposed of in Tehsil Council Drain after proper treatment through activated sludge process for which treatment plant has already been installed. Municipal wastewater coming from various municipal works, such as cleaning will be generated, which will be treated via a Septic Tank. Process flow diagram of WWTP is attached as annexure	Don Valley Pharma	Throughout project lifecycle	None

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Air quality management				
Particulate emissions and generator stack emissions	No air emission is likely to be released during operation of the project; except the dust or PM to be produced during floor cleaning and other such operations, which also will not be posing any environmental threat (will not breach the safe standards). Wet suppression is done to control dust emissions. Generator emissions will be controlled by providing proper enclosure, tuning and maintenance.	Don Valley Pharma.	Throughout operation phase	Local air quality will be virtually unaffected and will be based on PEQs

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Noise & vibration				
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 green belt will be developed all around the plant which will be acting as noise barrier. • Introduction of control and monitoring rooms having good sound insulation properties. • All the workers will be provided with earplugs. • All the transporters will be advised to carry out regular maintenance of their vehicles.	Don Valley Pharma.	Throughout project lifecycle	Noise level will be based on PEQs
Traffic & transport				
Increased heavy Vehicles traffic both locally and nationally	• Restricting delivery hours to reduce noise nuisance; avoid heavy truck movements in the night hours will be considered whether deliveries should be scheduled to avoid peak times to reduce congestion	Management	Throughout of Don Valley Pharma.	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.

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EHS				
To minimize loss work injury/hazards/incidents/accidents	• Training regarding EHS should be given on the regular basis. • Workers will be given PPEs such as helmets, mask, earplugs/muffs, safety boots, etc. • It should be strictly enforced to wear PPEs while working. • Workers will be trained on the regular basis regarding personal safety and disaster management. • Incidents should be reported directly to the concerned authority.	Environmental manager/EHS	Throughout lifecycle of project	Potential of injuries will be minimized
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 be contacted in the case of emergency will be displayed on-site	Environmental manager/EHS	Throughout lifecycle of project	None

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Fire hazard				
To prevent any disaster	• Firefighting equipment including DCP type fire extinguisher, CO2 Type 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. • Checking and maintenance of the fire-fighting equipment will be carried out on the regular basis. • Emergency evacuation plan is annexed.	Environmental manager/EHS	Throughout lifecycle of project	Potential of disaster will be minimized by suggested mitigation measures implementation
Employment				
To provide job opportunities and helping in improving living standard of people	• During this phase, skilled and unskilled labor will be required. • Employment opportunities for the un-skilled workers will therefore increase which will enhance the positive benefits for the local people who are in dire need of income for sustenance. • Indirect opportunities for employment will arise from the provision of services to the construction teams, such as sale of raw material such as cement, bricks, sand etc., as well as food and beverages for the labor and after completion of construction phase serve as a permanent business opportunity.	Don Valley Pharma	During construction and operation phase	Direct and in direct jobs

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6.1 ENVIRONMENTAL MONITORING PROGRAM

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 14: Environmental Monitoring Program

Env. Components	Project Stage	Parameters	Instrument	Standards	Monitoring			Institutional Responsibility
					Location	Frequency	Duration	
Air	Construction	PM10, SO2, NO2, CO, SPM, O3	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	Monthly	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		Reading to be taken at 15 seconds interval for 15 minutes	Through approved third party/monitoring lab

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							every hour and then averaged	
Wastewater	Operation	BOD, COD, TSS etc.	Through approved equipment	PEQs	ETP	Monthly	As per approved testing method	Through approved third party/monitoring lab

6.1 ROLES & RESPONSIBILITIES OF ENVIRONMENT MANAGEMENT TEAM

The Proponent will utilize the following arrangements in the implementation of the EMMP during planning and design, construction, and operation phase. The Proponent is accountable for ensuring that resources are made available to effectively implement the EMMP and necessary environmental management measures arising from the project.

Position	Responsibility
Project Manager	• Supervising construction works. • Schedule preparation and resource forecasting for engineering and other technical activities relating to the project. • Effective implementation of the EMMP. • Regular performance reviews. • Corrective and/or remedial action where this may be required.
Contractor	• Undertake development of facility in accordance with contract signed with the Proponent. • Adhere to Proponent HSE policies, procedures and other requirements while undertaking the Project. • Implement aspects of EMMP assigned to them

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HSE Executive	• Preparation of environmental monitoring, reporting and any permit applications (if any) • Overseeing of construction process and ensuring the implementation of avoidance and mitigation measures • Conducting monitoring and review of EMMP implementation by contractor • Inspect the constructed facility after completion

6.7.1 Primary Responsibilities

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

6.7.2 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.

6.7.3 Supervision & Monitoring

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

6.8 REPORTING & REVIEWING PROCEDURES

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

6.8.1 MEETINGS

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

- Kick-off meetings.
- Weekly meetings

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

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

6.8.2 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.

6.9 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.

Table 15: Training Program

Target audience	Trainers	Contents	Schedule
Selected management staff	Contractors	Key finding of mitigation measure	After every five months
All personnel	EHS Officer	Mitigation measures	Monthly
Technical Staff	EHS Officer	Waste disposal or sale out status, vehicle movement restriction and other mitigation measures	After every three months
Other staff	EHS Officer	Waste disposal, resource conservation and other mitigation workers	Monthly

6.10 EQUIPMENT MAINTENANCE DETAILS

The project is about pharmaceutical unit namely "Don Valley Pharma". Machines in pharmaceutical unit will be maintained on the regular basis. The fire-fighting equipment that would be installed in the halls/buildings will also be checked and maintained or regular basis. Only fire safety equipment such as portable fire extinguishers will be installed which will need regular maintenance and check in order to eliminate hazards associated the fire risks. Following are the maintenance

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details for the machines and equipment:

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

6.11 ENVIRONMENTAL BUDGET

Approximately PKR1.2Million budget will be reserved for tree plantation, solid waste management, wastewater management and environmental monitoring. Monitoring tests for ambient air quality, noise and ground water quality will also be conducted.

Table 16: Schedule for Implementation & Environmental budget

Amenities	Frequency	Costin PKR (Million)	
Ambient air monitoring	Construction: Bi-annually	20,000/-	0.2 Million

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	Operation: quarterly		
Noise monitoring	Construction: Biannually Operation: quarterly	10,000/-	
Water quality monitoring	Construction: Biannually Operation: quarterly	20,000/-	
Health & safety	Daily	30,000/-	
Tree Plantation/Green Belts Development	Monthly	60,000/-	
Solid Waste Management	Monthly	60,000/-	
Wastewater Treatment	Monthly	1Million	
Total Cost		**PKR1.2 Million**	

Sr.#	Activities	6Months			6Months			6Months			6Months		
		2M	2M	2M	2M	2M	2M	2M	2M	2M	2M	2M	2M
1	Detailed Designing	■	■	■									
2	Mobilization of Contractors				■								
3	Lean Construction Period					■	■	■					
4	Peak Construction Period								■	■	■	■	
6	Installation of machinery										■	■	■
7	Installation of firefighting equipments & Emergency exits												■

M=Month

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7 CHAPTER7: CONCLUSION AND RECOMMENDATIONS

7.1 CONCLUSION

The report presents Environmental Impact Assessment (EIA) of the said pharmaceutical unit.

EIA of Said Project is performed according to guidelines of EPA. It includes a 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 strengthen 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 Don Valley Pharma 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.

7.2 RECOMMENDATIONS

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

- Implementation of EMP must be given top priority.
- Proper PPEs including ear plugs, earmuffs, mufflers, goggles, gloves, and shoes etc. should be provided to workers.
- Train workers to use PPEs.
- Advise workers to follow SOPs.
- Equipment maintenance and efficiency must be checked.

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- 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.
- Proper tree plantation plan should also be developed in order to make the unit environment friendly.
- Small waste storage bins should be installed at different corners for proper waste collection and discharge.
- Proper dispensary and first aid box should be provided for workers.
- Smoking should be avoided within the premises of project site and near fuel storage areas.
- The Security Guards shall also be trained to act in case of all possible emergency situations. The fire alarms can be activated to signal evacuation. At the same time, communication shall be made with hospitals, emergency services and police for urgent support.
- The proposed Environmental Management & Monitoring Plan should be implemented.

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