EXECUTIVE SUMMARY

INTRODUCTION

This executive summary presents an overview of the main findings of the Environmental Impact Assessment (EIA) report for the project that is M/s Krypton Pharma (Pvt.) Ltd. The main objective for the Pharmaceutical Unit that is M/s Krypton Pharma (Pvt.) Ltd. is to manufacture high quality intravenous liquids to fulfill the demand of local market. The Environmental Impact Assessment (EIA) of the project has been conducted in accordance with the Punjab Environmental Protection (Amendment) Act 2012 and IEE/EIA Regulations 2022. The process for conducting environmental assessment and the results of EIA are described in this document.

BRIEF INTRODUCTION OF COMPANY

Wajahat Ali Khan bought this pharmaceutical unit in 2016 while proper working has not been started. After getting environmental approval from EPA, Punjab, proponent will start proper working. The working in the pharmaceutical unit will be according to the standards and All raw & packing materials will be purchased as per standard specifications. Quality will be the key in M/s Krypton Pharma (Pvt.) Ltd. for which a range of sophisticated state of the art technology has been engaged. The sophisticated plant and equipment will be matched with technical and professional expertise.

The finished goods are packed in the labeled cartons and stored finally in the air conditioned ware house for shipment to other areas. Its total dedication and devotion is towards quality of life through healthcare. M/s Krypton Pharma (Pvt.) Ltd. will bring in advanced technology for Research & Development which includes research aided by a resourceful library, design / selection of process maximizing efficiency and minimizing the environmental impact, long term stability testing, product quality optimization and translation of new scientific insights into the products. In fact, M/s Krypton Pharma (Pvt.) Ltd. will grow with its quality products through extensive Research & Development projects.

SALIENT FEATURE OF PROJECT

Proponent	Malik Bilal Akram S/O Malik Muhammad Akram
Project Name:	Construction of Pharmaceutical Unit namely M/s Krypton Pharma (Pvt.) Ltd.
Plant Location	Plot No. 52, Pharmaceuticals Zone, M-3, Industrial City, Faisalabad
Cost of the Project:	1 Billion approx.
Water consumption:	75 Liters
Total Area	Plot Size 3.56 Acres (128,160 Sq.ft)
Fuel:	Electricity & Diesel
Source of power:	WAPDA (primary) 200 KVA Transformer 40 KVA HSD Based Generator

ENVIRONMENTAL STATUS OF THE STUDY AREA

The base line environmental status was assessed based on primary and secondary data collected through in-site field observation and obtained from agencies such as Environment Protection Department, Town Municipal Administration, Public Health Engineering Punjab and District Design Committee.

The following environmental components were focused for this study:

- Land Environment (Geology, Geo-hydrology, Land use, Solid Waste generation and characteristics)
- Socio-Economic Environment (Demography profile, Occupational structure, educational status, literacy status, etc.)

The baseline status collected from analysis of secondary and primary data is summarized below:-

Data was collected from meteorology department during study period of this project. The climate of the district Lahore is hot and dry. The summer season starts in April and continues until October. May. June and July are the hottest months. The mean maximum and minimum temperatures for these months are about 47 and 28 degree Celsius. Dry, hot, and dusty winds are common during summer.

Biological Environment:

No protected area (PA) or any ecological sensitive area is located within 05 km radius of the proposed site. The positive and bright line of the project is that it is within the industrial city, Faisalabad. While proponent will plant the trees during operational phase to make sure project is environment friendly.

Environmental Consultant

An Environmental Impact Assessment (EIA) study report has been prepared to identify and predict the significant environmental impacts due to activities in the pharmaceutical unit followed by delineation of appropriate Environmental Management Plan are included in the EIA report. Management of M/s Krypton Pharma (Pvt.) Ltd., has decided to conduct EIA report for the project through Environmental consultant, Ecosphiron Environmental services, Office#7, 2nd floor, 9-Kashmir Block, jalal centre, main boulevard Allama Iqbal Town, Lahore.

Baseline Study:

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, installation and operational phase of the Project along with proposing suitable mitigation measures and formulation of Environmental Management & Monitoring Plan (EMMP) for implementation of the project in environment friendly manner. A review of the legislation/regulatory regime applicable to the project has been undertaken. The project will need to take into account a number of relevant laws, environmental protection agency's environmental guidelines, and various international treaties and conventions on the conservation of the environment to which our country is a signatory.

Socio-economic Condition

A full review of the environmental and social baseline conditions at and around the main site has been undertaken. The main information sources have included consultation and data gathering exercises in the project area, desk-top studies, existing information sources, field surveys and data from the Project Proponent. In order to consult with the people near the project site, field survey, private visits and interviews

of people are conducted near the project area to inform and collect public opinion, where the findings are concluded as that the project will not have major adverse impacts on the socio-economic environment of the existing community. Physically, the project site is located in industrial area so the operation of the project would not be a nuisance in any respect for the community. Moreover, the project will have positive impacts in terms of employment opportunities for both local labor and skilled and educated personnel. A thorough review has been undertaken to identify all the activities with the potential to result in environmental impacts during construction and operating conditions. The project will not have major adverse impacts on the existing environment and community. Overall the social impact of the Project was determined to be positive for the local population and the country as a whole.

Recommendation for Environmental mitigation

Environmental impact of a project is worked out using various factors and parameters, so that an environmental Management Plan can be evolved to take mitigation measures, wherever these might be considered necessary. Weather describes an impact as having both spatial and temporal impacts, which can be described as the change in an environmental parameter over a specified period and within a defined area, resulting from a particular activity compared with the situation which would have occurred had the activity not been initiated. Environmental issues associated with operation of the project could include water consumption, safety hazards, public health and nuisances, and increase in noise. However, the magnitude of these impacts shall be much less than those related to impacts during the construction.

Proposed monitoring

Monitoring has been carried out randomly. At the project site, ambient, water and noise level has been examined. The monitoring has been carried out by Punjab Environment Quality Standards (PEQS). Monitoring results has been discussed in baseline study chapter.

The Anticipated Impacts

The expected impacts from the project are mostly insignificant and others are of limited nature. In this regard possible improvements and mitigation measures have

been taken. The study also shows that there will be no exploitation and consequential depletion of the local natural resources. The general approach to Environmental Management Plan for the Project, for the construction and operational phases of the Project has been presented, along with an outline plan for the Project Environmental Management Plans (EMPs).

Conclusion

The Environmental Impact Assessment (EIA) contains 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. While the objectives of this study have been to describe the project and its environmental impact, it also identifies adverse environmental factors associated with the project. Appropriate mitigation measures as explained in the environmental study should reduce, if not eliminate, these impacts so that these are within acceptable limits. It is further concluded that all potential environmental concerns associated with the project have been adequately addressed, and no further study is required in this context. The objective of the preparation of an environmental study is to identify how the environment is impacted and to suggest mitigating measures to reduce if not totally eliminate adverse effects of a project. It is accordingly recommended that Environmental Approval for the project should be issued by the Punjab Environmental Protection Agency subject to payment of the requisite scrutiny fee by the proponents of the projects.

The main key persons involved in finalizing EIA report are following;

Ms. Shakeela Rani	**Mr. Manzoor Ahmad**
Environmentalist	Environmentalist

For the Proponent

I have reviewed the project EIA report and found the contents to be valid and true to the best of my knowledge and belief.

Mr. Malik Bilal Akram S/O Malik Muhammad Akram

(Proponent)

M/s Krypton Pharma (Pvt.) Ltd., FSD

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CHAPTER I

INTRODUCTION

1 Purpose of report and identification of the project:

Pakistan is a developing pharmaceutical market, with a large population and economic progress evident. Private spending accounts for 65% of total healthcare expenditure sourced through out-of pocket payments, international aid and religious or charitable institutions. Pharmaceutical spending accounts for less than 1% of the country's GDP, comparable to levels in some neighboring countries but above that in some of the South Asian countries. The forecast period is likely to witness the marginal strengthening of the generics sector, albeit more in terms of volumes than values. Pakistan Pharma Industry boasts of quality producers and many units are approved by regulatory authorities all over the world. Like domestic market the sales in international market have gone almost double during last five years. In the meantime, exports are also likely to be boosted by new regional and global opportunities.

Purpose of the report:

The Pakistan Pharmaceutical Industry is a success story, providing high quality essential drugs at affordable prices to Millions. Technologically, strong and self-reliant National Pharmaceutical Industry is not only a key role in promoting and sustaining development in the vital field of medicine within the country, but is also well set to take on the international markets.

This Report presents the Environmental Impact Assessment (EIA) for the M/s Krypton Pharma (Pvt.) Ltd., located at Plot No. 52, Pharmaceuticals Zone, M-3, Industrial City, Faisalabad. For this purpose the proponent has decided to engage environmental consultants, Ecosphiron Environmental Services to conduct Environmental Impact Assessment (EIA) for the construction of project. The purpose of this study is to identify the environmental baseline i.e. physical, biological and socio-economic/cultural conditions and assess all possible impacts arising during the construction and operation phase of the project and to find out appropriate measures for their mitigation, to either eliminate those impacts or to bring them to acceptable level and formulation of Environmental Management Plan (EMP) for implementation of the project in environment friendly manner.

The report is prepared by critical examine of the environmental factors which might be affected due to construction and operation of the project. The purpose of this report is to analyze impacts of the project. This EIA provides the basis for a determination of the degree of the environmental impacts of the proposed project. The report provides relevant information, as required under the officially approved format, to help the decision makers i.e. EPA Punjab before issuing for the Environmental Approval. This report intends to provide satisfactory mitigation measures to avoid/eliminate any chance of adverse environmental impact on the socio-cultural, economic and environmental components. This report also intends to fulfill the regulatory requirements set under Punjab Environmental Protection Act (Amended 2012) 1997 and its consequent legislative framework for IEE/EIA including the IEE/EIA Regulations 2022 and the guidelines drafted for IEE and EIA under numerous sectorial heads. The entire set of legislative framework requires any new development project to undergo an IEE or EIA based on the categorization of the project under Schedule I and/or Schedule II.

PROJECT AREA & TOTAL COST OF PROJECT

Project Area	The total area of the Plot Size 3.56 Acres (128,160 Sqft)
Total Cost	Total cost for proposed project is one billion approximately.

1 Identification of Proponent

Name: Malik Bilal Akram S/O Malik Muhammad Akra

Address: Seventh Road, H. # NA-201, Street No. 7, Muhallah Park Town, New Malpur, Rawalpindi

Contact Person and Cell Number: Mr. Humayoun (0333-5301336)

Environmental Consultants

An initial Environmental Examination (IEE) study report has been prepared to identify and predict the significant environmental impacts due to project along with Environmental Impact Assessment followed by delineation of appropriate Environmental Management Plan are included in the EIA report. Management of M/s Krypton Pharma (Pvt.) Ltd., located at Plot No. 52, Pharmaceuticals Zone, M-3, Industrial City, Faisalabad has decided to conduct EIA report for the project through Environmental consultant, **Ecosphiron Environmental services, Office#7, 2nd floor, 9-Kashmir Block, jalal centre, main boulevard Allama Iqbal Town, Lahore.**

+92- 322-4908520, 0301 4276787

Email: ecosphiron@gmail.com

1.4 Nature and Size of Project

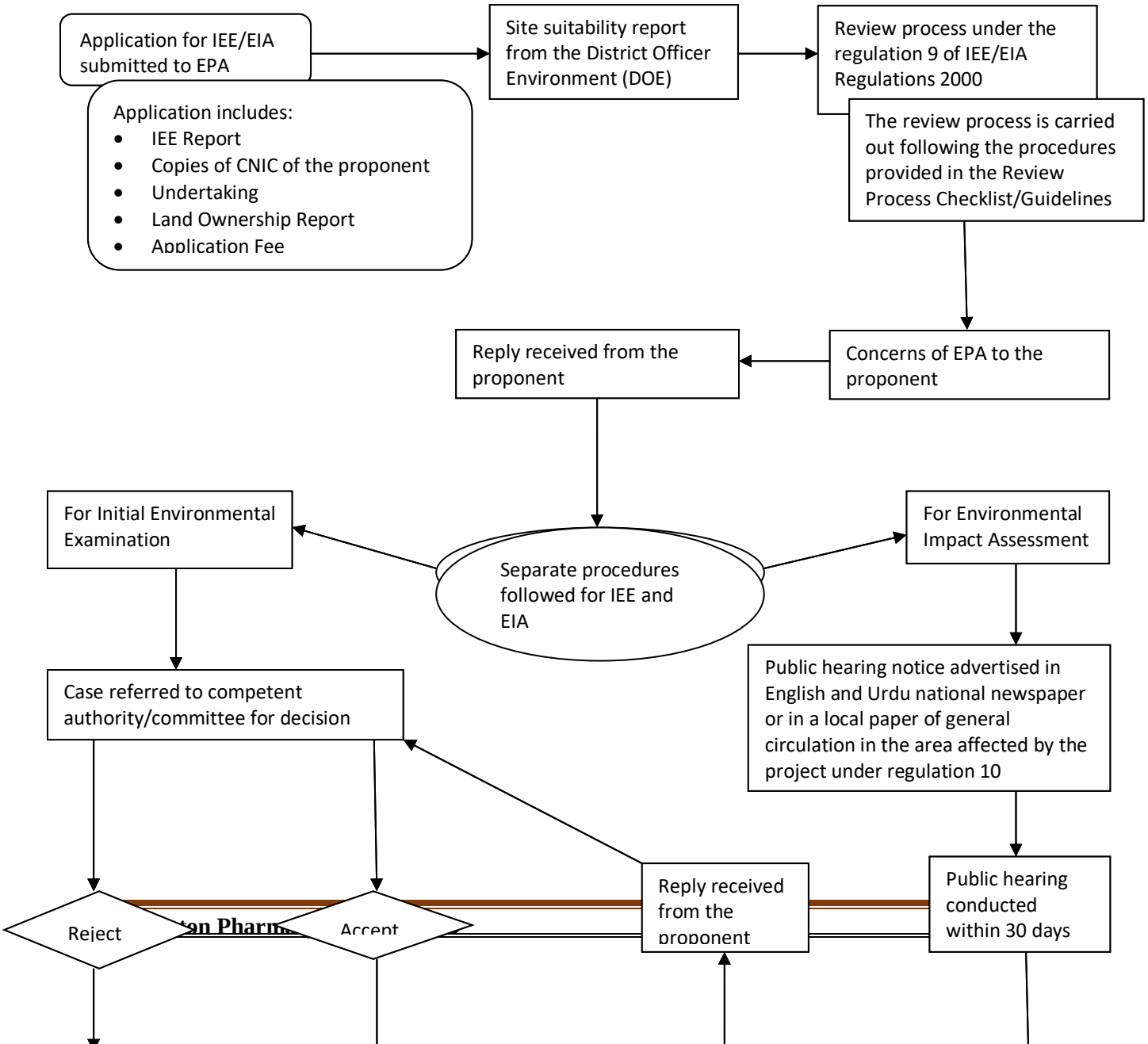
Location. The proposed project is located at Plot No. 52, Pharmaceuticals Zone, M-3, Industrial City, Faisalabad.

1.4 Extent/scope of EIA Study

This EIA report has been conducted in accordance with the requirements of PEPA, 1997 (amended 2012), IEE/EIA regulations 2022 as well as section 2.3 of the guidelines for the perpetration and review of environmental reports, November 1997/2022. This EIA report presents screening of potential environmental impacts of the proposed construction and operational phase and presents the necessary mitigation measures to eliminate or reduce the negative

impacts to an acceptable level. The report provides an Environmental Management and Monitoring Plan and the institutional requirements for the implementation of this plan. The EIA process followed all the complementary stages described in the guidelines for IEE/EIA preparation and review. A brief flowchart exhibiting the different stages involved is in Figure 1.2

Figure 1.1: EIA Process Flowchart



1.3.1 OBJECTIVES OF EIA

The main objective of this Environmental Impact Assessment (EIA) is to identify the baseline environmental, physical and the socio-economic conditions and the potential impacts along with formulation of suitable mitigation measures of an environment friendly implementation of the project. The objectives are as follow:

To assess and establish the existing environmental and socio-economic conditions of the area.

- To assess and establish the potential environmental and socio-economic impacts of the project activities and identify the issue of concern.
- To implement and execute environmental safeguards.
- To propose mitigation and monitoring measures that can be incorporated into the operation of the project to remove or reduce any damaging effects as far as possible.
- Categorization of the significant impacts requiring further consideration.
- To describe the Environmental Management Plan for the project.

1.4. SCOPE & METHODOLOGY

EIA is conducted under the legal framework of Environmental Protection Agency (EPA) Punjab. As per legal requirements, the Project will be reviewed in the light of the provisions of Punjab Environmental Protection (Amendment) Act, 2012 and

IEE/EIA Regulations 2022, issued by Pakistan environmental Protection Agency (Pak EPA) and adopted by the EPA Punjab.

Secondary information for this Study was collected from the relevant departments and literature to identify physical, socio-economic and environmental issues of the Project Area. Relevant information available with the proponent on the physical, technical and institutional aspects of the Project was also utilized.

1.4.1 Orientation Session

Meetings and discussions were held with all the partakers of the Project. Purpose of carrying this activity was to develop a common understanding of various issues related to study.

1.4.2 Planning for the Collection of relevant Data

Following the concept illumination and understanding obtained in the first step, a detailed data acquisition plan was developed for the internal use of Consultant EIA team. The plan identified the type of data required and their sources, time scheduling for their collection and logistics and facilitation required for the execution of the data acquisition plan.

1.4.3. Data Collection

In this step, secondary information about physical, technical and environmental parameters available with the proponent was collected. For collecting the additional data, the concerned persons were also consulted.

1.4.4 Review of Potential Environmental Impacts of the Project.

EIA Consultants reviewed the Project with the aim to determine the likely impacts of the project on the environmental and socio-economic conditions of the area.

Following elements of the project were reviewed and compare with the existing conditions in the vicinity of the project Area and screening criteria was applied to Identify significant (long/short term) environmental impacts.

- Impacts of the project on physical and ecological environment of the Project Area.
- Impacts of the Project on socio-economic environment.

1.4.5 Mitigation Measures and Implementation Arrangements

Mitigation measures and implementation mechanism were proposed so that the proponent could incorporate them during the Construction & Operational Phase of the Project.

1.5 COMPONENTS OF THE REPORT

This EIA Report presents the screening of potential environmental impacts of the project and discuss the necessary mitigation measures to eliminate or reduce the negative impacts to an acceptable level. It also describes the institutional requirements and provides an Environmental Monitoring Plan (EMP).

EIA report comprises of following chapters.

Chapter 1: **Introduction:** A description of the project including the need for the project and how the project will be undertaken.

Chapter 2: Project Description, Full description of the relevant parts of the project implementation schedules, site plans and summary of project inputs and outputs.

Chapter 3: Statutory Requirement & Standards, A description of the pertinent national legislation, regulations and policies that are relevant and applicable to the project and a demonstration of how the project conforms to these aspects.

Chapter 4: Description of the Environment, Information about the existing baseline environmental conditions of the site.

Chapter 5: Stakeholder Consultation, For the project surrounding people were visited to come to know about the project. This was the study actually to come to know how much people are willing for this project.

Chapter 6: Potential Environmental Impacts and Mitigation. An assessment of the potential impacts during both construction and operational stages of the project as well as identification of the potential mitigation measures to prevent or reduce significant negative impacts during both construction and operation stages of the project.

Chapter 7: Environmental Management Plan: Recommendations made and the final conclusion of the EIA report.

Chapter 8: Conclusion and Recommendations, This chapter includes of summery overall project description and suggestions after incorporating the managing plans.

CHAPTER 2: DESCRIPTION OF THE PROJECT

General

This section of the study renders a detailed account of the project and its salient features, such as location 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.

2.1 Type and Category of Project

As per Review of initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) Regulations, 2022 the project of Pharmaceutical Unit namely M/s Krypton Pharma (Pvt.) Ltd., located at Plot No. 52, Pharmaceuticals Zone, M-3, Industrial City, Faisalabad does not fall in any category of projects mentioned in Schedule I & Schedule II, however, EIA of this project has been prepared as mentioned in Schedule II, "B" Manufacturing and Processing and its sub clause is (2) Chemical manufacturing units, including pharmaceuticals and cosmetics.

2.2 Vision of M/s Krypton Pharma (Pvt.) Ltd

Our vision is to make affordable and user-friendly products that everyone can use to improve their lives. To fulfill this vision, we constantly strive to provide our customers with innovative, competitive and sustainable solutions, while always taking patient needs into account. With our experience and technology, we can assist our customers at any and every stage of the development process to help ensure the product's success. If the patient is offered an affordable product that they prefer, they will be happy, our customer will be happy, and we will be happy. We are deeply committed to the success of our customers.

2.3 Alternatives Considerations

The motivation behind erection of pharmaceutical unit includes multiple factors that ensure its sustained operation including availability of the medicines in the market. These factors include availability of access roads, communication facilities, electricity, gas, basic infrastructure, sewer etc. Of course neat and clean environment is also priority consideration.

Alternative I- No Project Option

There is always 1st option that there should be no project which cause any sort of pollution in the environment but with increasing demand of the medicine and keeping view on number of diseases it cannot be not rejected to ensuring the availability and considering the health options so that for pharmaceutical unit operation be in control. For this sake pharmaceutical unit should be acknowledged. This project will fulfil the demand of medicine in the market by ensuring its availability and considering the importance of health in the general public.

Alternative II- Land Availability

The positive and prosperous effect of the pharmaceutical unit is that it is located in the industrial zone where already industrial activities are going on. Being in the area of the land is available for the construction of the project. Moreover the positive consideration of this project is located in vast available land and all resources subject to requirements of the project. So tremendous positive aspect for pharmaceutical unit, there is no especial land need is required for concerned project. It occupies small area but will work efficiently and will provide medicine to enhance and fulfill the industry gap.

Alternative III - Basic Infrastructure and Facilities

All the basic infrastructure like roads; transport; water; communication facilities like telephone, fax and e-mail; utilities required to run the unit smoothly exist near the project vicinity. Thus availability of all resources required for the implementation of the projects are present in the project vicinity that ensuring the erection of the project in the site.

Alternative IV - Environment Sustainable Factor

Environmental considerations are of utmost importance in selecting site. Being in an industrial city there is no sensitivity in the area from environmental setting point of view. Thus there is no ecologically sensitive or declared protected area such as territorial waters, forest, game reserve or biodiversity parks within a 10 km radius of the project site, requiring the proponent to look for site alternatives.by considering all environmental factors it has been considered project will bring prosperity for in context of medicines.

2.3 Location Plan/Map

Project is in the ideal location that is in the industrial zone. Exact location of the project is Plot No. 52, Pharmaceuticals Zone, M-3, Industrial City, Faisalabad. Map is annexed.

2.4 Land use on the site

The area is industrial in nature as per the Faisalabad Industrial City, is surrounded by a cluster of pharmaceutical units. There is no residential settlement in close proximity of the project location

2.5 Road Access

As per the area and the nature of the project is located in the industrial units. Main Industrial road FSD become the bridge for transfer of the items to and from the project location. There is an easy access to the site because project located in industrial cluster of the FSD City where many pharmaceuticals industrial units exists.

2.6 Vegetation Feature on the site

Project is located in the industrial cluster. The site is barely have any flora or vegetation on the site. There is no trees inside the site. Near the project location there is no environmental sensitive one, protected area. There is no flora nor fauna present in the project location. One of the main significance of non-existence of the flora is that site is located in the industrial cluster. However proponent is committed to plant the trees after completion of construction work at the project site.

2.7 Cost and Magnitude of operation and Associated Activities

Cost of the project is approximately is one billion from the construction to the implementation and operational machinery, instruments & equipment is included. Project is environmentally friendly will be erected in a sustainable way to reduce and minimize the harmful impacts generated during the construction and operational phase. Construction of the site will be completed within a year. Meanwhile the proponent will be responsible for the monitoring of the site during whole construction period. So any adverse distresses should be removed or reduced at the level of PEQs.

Proposed Schedule of Implementation

Project implementation schedule drive on the basis of calculated quantities of works to be done and duration that is required to design, fabrication, supply and installation of

major project components. It is estimated that the completion of construction phase of entire project will be started after getting environmental approval from EPA, Punjab.

Activities involved are:

- Land acquisition
- Lay out plan of project (attached herewith this EIA report)
- Leveling of land
- Construction of M/s Krypton Pharma (Pvt.) Ltd.,

2.8 PROCESS DESCRIPTION

Ground water will be first extracted, purified by Ultra-filtration plant (Technical Specifications in Annexure) and tested for required parameters. After purification distillation process will be carried out to remove many of its impurities using Multi-effect water Distiller and tests will be performed to check and verify the removal of impurities. Prepared infusion sets will then be added into this distilled water and desired concentration of the solution will be prepared in a tank designated for the purpose. After that, test will be performed to check its quality. This infusion solution will be sterilized to remove any pathogens (bacteria, viruses) likely to be produced and a test performed to check the likely hood of any pathogens. If the solution passes the sterilization test, it is filled into the bottle. The stock solution in these bottles will be tested for microbial quality performing QC Microbiological testing for 15 days. After passing test, these bottles will be packed individually before packing into carton. After that, the product is ready for storage and transport.

PROCESSS FLOWCHART

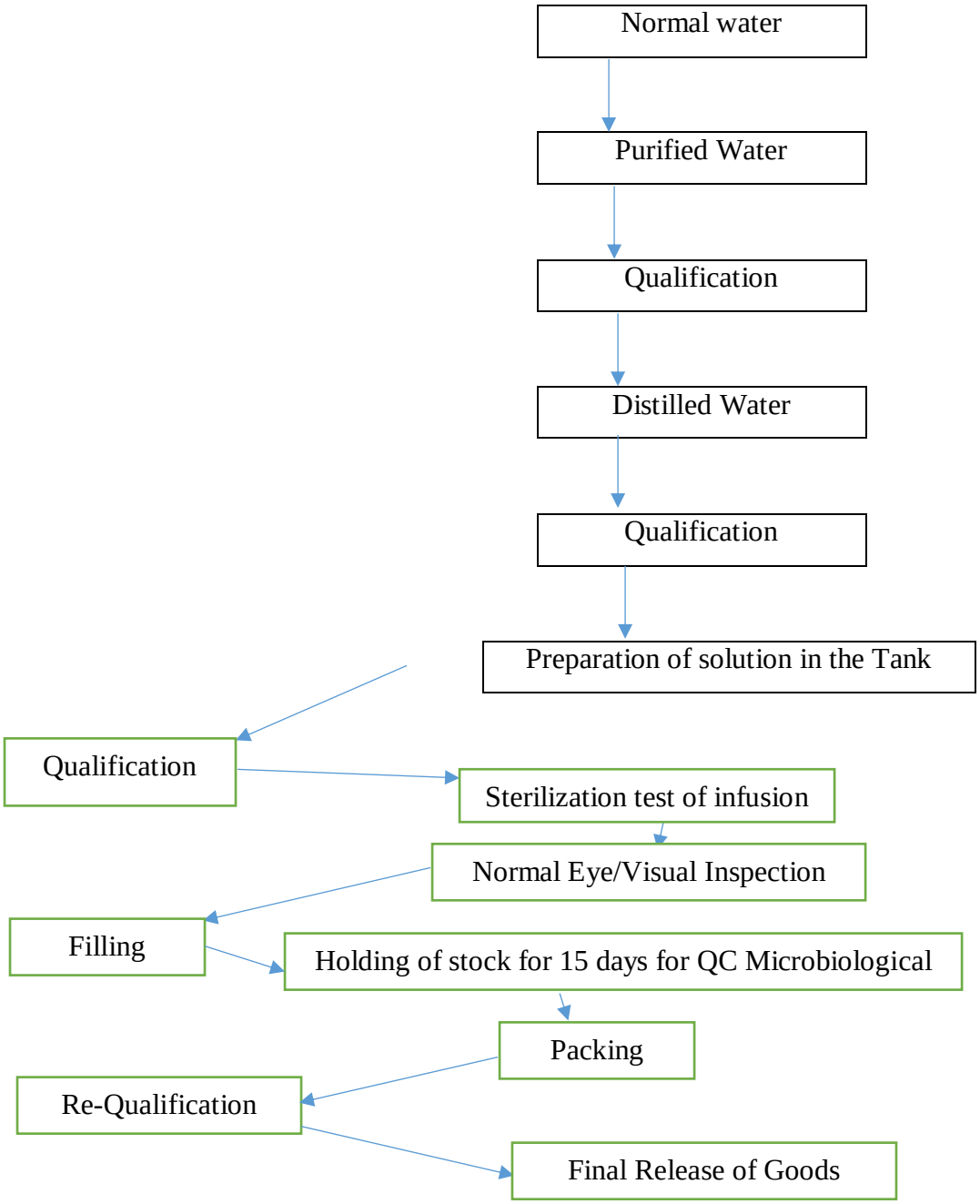


Figure 2.1: PROCESS OF I.V. SOLUTION

2.9 LIST OF MACHINERY

The details of Machinery and equipment are given in table 2.2

Sr.No.	Machinery / Equipments	Quantity
1.	Electronic Balance (0.001g-200g)	02
2.	Electronic Balance(0.01KG-100 Kg)	01
3.	Electronic Balance(0.001Kg-15Kg)	01
4.	Raw Materials Sampling Hood (NA)	01
5.	Dispensing Hood (NA)	01
6.	Wet Mixer (Ribbon Mixer) (50 Kg)	01
7.	Wet Granulator (NA)	01
8.	Paste Preparation Kettle (25 Ltre)	01
9.	S.S. Sieve #12 with Frame (NA)	01
10.	S.S. Sieve # 14 with Frame (NA)	01
11.	S.S. Sieve # 30 with Frame (NA)	
12.	Tray Dryer (30 Trays/50 Kg)	01
13.	Oscillating Granulator (NA)	01
14.	Double Cone Mixer (60 Kg)	02
15.	17 Punch Tablet Press (25,000/Hour)	01
16.	19 Punch Tablet Press (35000/Hour)	01
17.	Monsanto Hardness Tester (0-20 Kg)	01
18.	Vernier Caliper (0.1mm to 15 cm)	02
19.	Coating Pan (60 Kg)	02
20.	Hot Air Blower (NA)	02
21.	Solution Preparation Kettle (20 liters)	01

22.	Spray Gum With Stand (NA)	01
23.	Semi Automatic Capsule Filling Machine(8000 Capsules/hour (Max)	01
24.	Capsules Polishing Machine (500 Capsules/Minute)	01
25.	Blister Packing Machine (30-35 Cycles/Minute)	01
26.	Coding/Overprinting Machine (2000-3000 pieces/Hour)	01
27.	Conveyer Belt (Ss 304, 12 Feet, 1.3 KW Motor)	02
28.	Manometer (-10-50 C)	03
29.	Hygrometer (-0.05 3 IOW)	11

UTILITIES

30.	Water treatment Plant(RO+Deionizer)(2 Liters/Minute	01
31.	Air Compressors (1.6 KW)	03
32.	AHU(Raw Materials Sampling) (2.2 KW Motor, 5 HP Compressor	01
33.	AHU (Dispensing) 3.73 KW Fan motor 5 HP Compressor	01
34.	AHU(Manufacturing Areas) (4 KW Fan Motor, 10 HP Compressor	02
35.	AHU (raw Materials Store) (4 KW Fan Motor, 10HP Compressor)	01
36.	AHU (Finished Goods Store (4KW Fan Motor 10 HP Compressor)	01
37.	AHU (finished Corridor)(4 KW Motor, 2x7.5 HP Compressor)	02
38.	AHU (Packing Hall) (4 KW Motor Motor 12 HP Compressor	01

39.	AHU (Quality Control) 5.6 KW Fan Motor, 7.5 HP Compressor)	01

Table 2.2: Machinery, Process System & Equipment

N-1 **Quality control Equipment**

INSTRUMENTS REQUIRED FOR QC LAB OF I.V. SOLUTIONS

1	High Performance Liquid Chromatography Pump	Series-III
2	UV Visible Spectrophotometer	U-2020
3	Disintegration Test Apparatus	DT-1005
4	Dissolution Test Apparatus	DL-0708
5	Friability Test Apparatus	FB-2020
6	Digital Hardness Test Apparatus	HT-0607
7	Analytical Balance	TE 313S-DS
8	pH meter	Mi 150
9	Ultrasonic Water Bath	Supersonic-X3
10	Polari meter	WXG-4
11	Magnetic Heating Stirrer	78-1
12	Water Bath	HH-4
13	Melting Point Apparatus	Gallenkamp
14	Heating Drying Oven	9053A
15	Water Distillation Apparatus	HS-Z 115
16	Abbe Refraconmeter	WZS-1
17	Filtration Assembly	DOA-V608-BN

18	Vernier Calliper Digital	V-2000
19	Moisture Analyzer	DS-50
20	Stability Chamber	STC-410
21.	Screw Gauge	SG
22.	Glass Thermometer Mercury	Zeal

Table 2.3: List of quality Control Equipment

2.10 **LAND OWNERSHIP**

The land is owned by the proponent. Owner has purchased the unit in the 2015. Documents of purchasing have been submitted in the previous EIA report.

2.11 **MAN POWER**

The expected total number of workers required for the construction is 25. Workers of different categories will be employed at different points in time during construction phase of the project including professional/technical staff, administrative/managerial and support staff, skilled and unskilled labor. There will be one supervisor and one engineer at the site. In addition, the architect will be the consultant of the project on behalf of the proponent. During operational of the plant about 80-100 persons in different categories would be required for operation and maintenance purposes.

2.12 **WASTERWATER**

Pharmaceutical industry is the most important and rapidly growing Industries. It has high importance in term of Environmental Impacts. To mitigate the impact of wastewater and pursue the vision of sustainable consumption, the entire wastewater will be recycled as it will contain the IV solution and any abnormalities will be removed to prepare the adequate IV solutions again. Hence it will impose no impact on environment. While for domestic purpose there will be septic tank.

2.13 AIR EMISSION

Sprinkling of water will be practiced every day during the construction to cope up with dust emissions. During operational phase, air emission will not be issue because

all machinery will be run in the closed hall where all machinery will be equipped and fully grouted. Thus factor of air emission is nil.

2.14 SOLID WASTE GENERATION

Waste generated during construction would include mostly construction material (mainly steel and wood) empty cement bags, excavated earth and general packaging waste. Waste will be stored within the site until transfer to the waste disposal site. Reusable construction material will be recovered from the waste as much as possible. There will be domestic waste in operational phase. Domestic waste will be comprised on wrappers, plastic bags etc. The quantity of solid waste during construction phase will be around 4-5 kg per day while during operational phase, 2-3 kg per day weight will be produced which will be removed on daily basis by sanitary workers of that area. During operational phase waste might be of raw material by which final product will be prepared. That material will be collected by A.T Waste Management Company. The contract between these two parties has been signed and attached herewith this EIA report as an Annexure.

2.15 NOISE

All the machinery will be installed and operated in a closed hall and from operation of machinery will not generate any noise problem in the area. Further Administration of the Unit will take the precautionary measures to avoid the noise emission that can be generated within from the normal operation of the Pharmaceutical Plant. There is no possibility of Noise pollution.

2.16 SUPPLIES

WATER

The water requirement for the proposed project includes Water for construction service water, drinking water, water for Operation of project and water for fire hydrants. Ground Water will be used for the all purposes.

ELECTRICITY -

WAPDA will be the main source of electricity for this project while HSD based generators of 40 kva will be on standby mode also.

2.17 STAFFING

The staff will be hired with respect to concerned department according to their qualification.

2.18 EVACUATION PLAN

Management has planned a proper evacuation plan from Pharmaceutical Unit in case of any emergency Evacuation plan with proper exit points is attached in **Annexure**.

2.19 SECURITY AND EMERGENCY EXITS

The lay out is designed keeping view of security and it would be maintained according to policy of the company executing the project. Emergency exit passages will be made and maintained. A proper evacuation plan will be formulated to cope with any emergency situation. Assembly points will be set and displayed and proper training will be provided to the workers and staff.

2.20 FIRE FIGHTING SYSTEM

The firefighting system will include water and gas deices/ extinguishers. Plant will establish a proper firefighting system. Indoor and outdoor fire hydrants will be installed according to the codes and standards. Oil storage tank area will be provided with foam devices/extinguishers. Fire water storage tank will be constructed at the back side of plant which will have a capacity of storing 6912 ft of water. 10 fire Hydrants will be installed at the boundary walls of plant. Each fire Hydrant will have pipe length of 100 feet.

The dimensions of fire water storage Tank is

Length =36 Feet

Width = 24 Feet

Depth= 8 Feet

2.21 Restoration and Rehabilitation Plan:

The process or procedure to return the land at its former state is land rehabilitation. Land will be rehabilitated at some degree to ensure the safety by adopting suitable

mechanisms to make It feasible for further environmental benefits. Said project is in the industrial zone where no residential population exist even more said project is not located in any sensitive zone. . Zone is totally designated for industrial purposes. Said project is open land which is feasible for the project. So by considering project from all aspects, it has been concluded that project is environment friendly from all aspects and no need for rehabilitation or restoration.

2.22 Government Approvals:

License from the ministry of Drugs have been obtained and attached as annexed.

CHAPTER 3: STATUTORY REQUIREMENTS

3.1 General

Sustainable development and green economy is a concept that has emerged over the past decades to describe a new framework aimed at economic and social development while maintaining the long term integrity of the ecological system and environmental resources. The principal of sustainable development is in the process of being incorporated into the national policy and legislation through various statutory instruments. This chapter describes the current legal responsibilities of the proponent in context of environmental and sustainable development, and the institutions that exist in the country that may influence the environmental management of the project.

This section deals with the current policy as well as legal and administrative framework related to carrying out of Initial Environmental Examination (IEE) of the project. An efficient and effective organizational structure is essential for successful implementation of the mitigation measures identified for the project. Like other projects, the project, before its implementation, is required to go through an Environmental Assessment, in accordance with the provisions of the Punjab Environmental Protection (Amendment) Act 2012.

3.2 Existing Legislation and Legal Framework

The Federal Ministry of Environment was responsible authority for policy making on environmental protection in Pakistan but after 18th Amendment in the Constitution, the Provincial Governments have taken over the subject of Environment. This IEE study has been carried out in the light of the policy guidelines of the Preparation of IEE/EIA Reports under the procedures and practices formulated by the Pak EPA and adopted by the Punjab Environmental Protection Agency (EPA).

3.3 Institutional Setup

3.3.1 Environmental Protection Councils

The Punjab Environmental Protection Council (PEPC) is the apex decision-making body of Punjab. It has been developed under the provision of Punjab Environmental Protection (Amendment) Act 2012. It is headed by Chief Minister of Punjab with other members. The purpose of IEE is basically to obtain Environmental Approval from the Environmental Protection Agency (EPA), Punjab in compliance with Pakistan Environmental Protection Act (PEPA) - 1997, now having been replaced by Punjab Environment Protection (Amendment) Act 2012.

3.3.2 Environmental Protection Agencies

Pak EPA has been established at the Federal level and EPAs are established at Provincial level also. In Punjab an independent Environmental Protection Agency is constituted headed by the Director General.

3.3.3 Environment Protection Department, Punjab

The Punjab Government has established Environment Protection Department (EPD) administratively controlled by the Secretary, Government of Punjab. The EPD has its independent Minister. According to the provisions of the Punjab Environmental Protection (Amendment) Act, 2012, EPD has a significant role in policy making and implementation of the environmental laws in the Punjab Province.

3.3.4 Relevant Legal / Institutional Framework

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

A number of laws have been promulgated by the Government of the Pakistan to deal with the environmental and social aspects related to the implementation of various development projects in the country. In 1983, the Government of Pakistan issued an Environmental Protection Ordinance (EPO) that was replaced by the PEPA, 1997, through an Act of Parliament. According to the 18th Amendment in Constitution, the PEPA 1997 has been confined to Federal Area and provinces have been allowed to formulate their own environmental legislation in the subject of environment.

Under the PEP Act, it is mandatory to carry out IEE or EIA for all development projects. The Pak EPA has also framed guidelines for environmental assessment of projects in various developmental sectors, According to PEPA 1997; the Punjab Environmental Quality Standards (PEQS) were established for effluents discharges and gaseous emissions of various Municipal and Industrial sources. The latest revision of PEQS as carried out in year 2000.

Provincial Environmental Protection Departments are also working on the formulation and enforcement of environmental statutes and by-laws. The Pak EPA has issued several policies guidelines and adopted measures for streamlining the environmental assessment. Though, the need for environmental screening and assessment has received some weight during the recent past, strict implementation of the PEQS is still a dream to be realized. The applicable laws for the environmental study of the Project are briefly described below:

3.4 Pakistan Environmental Protection Order (PEPO) 1983

In 1983, the Government of Pakistan issued an Environmental Protection Ordinance (EPO) 1983. It was the first legislation promulgated for the protection of environment. According to PEPO, 1983 it was necessary to carry

out IEE / EIA for all development projects, but there were no IEE / EIA regulations under that ordinance.

3.5 Punjab Environmental Protection (Amendment) Act 2012

Section 12 of the Punjab Environmental Protection (Amendment) Act 2012 makes it mandatory for the proponent of a project to file with the Environmental Protection Agency either an Initial Environmental Examination (IEE) or Initial Environmental Examination (IEE), as the case may be, in respect of the project.

As per definition given in the Punjab Environmental Protection (Amendment) Act 2012, Initial Environmental Examination (IEE) means an environmental study comprising collection of data, prediction of qualitative and quantitative impacts, comparison of alternatives, evaluation of preventive, mitigation, and compensatory measures, formulation of environmental management & training plans & monitoring arrangements, and framing of recommendations and such other components as may be prescribed. The provision of Section 12 has been incorporated "as it is" in the new Punjab Environmental Protection (Amendment) Act, 2012.

3.6 National Environmental Policy 2005

Government of Pakistan has notified National Environmental Policy 2005, for different projects/aspects in which guidelines/priorities have been given to undertake/commence the projects having significant environmental impacts.

The National Environmental Policy (2005) provides a framework for addressing the environmental issues (particularly pollution of fresh water bodies and coastal waters, air pollution, lack of proper waste management, deforestation, loss of bio diversity, desertification etc.) confronting Pakistan. It recognizes the goals and objectives of the Pakistan National Conservation Strategy (PNCS, 1992), National Environmental Action Plans, and other existing environment related national policies, strategies, and action plans. It also provides broad guidelines to the Federal Government, Provincial Governments, federally administrated territories and local governments to address their environmental concerns and to ensure effective management of their environmental resources.

3.7 Review of IEE / EIA Regulations 2022

The Pak EPA has issued Review of the Initial Environmental Examination and Environmental Impact Assessment Regulations 2022, to review the Initial Environmental Examination (IEE) / Environment Impact Assessment (EIA) reports. Categorization of the projects for IEE and EIA is one of the main components of the Regulations. Projects have been classified on the basis of expected degree of adverse environmental impacts. Projects type listed in Schedule I are designated as potentially less adverse effect, schedule I projects require an IEE and projects given in schedule II require EIA to be conducted.

Salient features of the Regulations are listed below:

- Categories of project requiring IEE and EIA are issued through two schedules attached with the regulations.
- A fee depending on the cost of the project has been imposed for the review of IEE and EIA.
- The submittal is to be accompanied by an application in prescribed format included as Schedule IV of the Regulation.
- The EPA is required to issue conformation of compliance within 15 days of receipt of request and complete documentation.
- The IEE / EIA approval for construction of the project will be valid for three years from date of accord.

3.8 Guidelines for the Preparation of IEE/EIA Reports

The Pak EPA has also framed Guidelines for the Preparation of IEE / EIA of projects in various developmental sectors.

3.9 The Punjab Local Government Ordinance, 2001

Schedules 4 and 8 of this Ordinance pertain to environmental pollution. There are not withstanding any specific provisions, every local government may perform functions conferred by or under the Punjab Local Government Ordinance, 2001, and in performance of such functions may exercise such powers, which are necessary and appropriate. Under the ordinance, the local councils are authorized to restrict projects causing pollution to air, water or land. They may also initiate schemes for improving the environment.

3.10 Pakistan Penal Code, 1860

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

3.11 The Land Acquisition Act, 1894

The Land Acquisition Act (1894) deals with the acquisition of private properties for public purposes. There are 55 sections in this Act mainly dealing with area notification, surveys, acquisition, compensation, apportionment awards, disputes resolution, penalties and exemptions.

Although quite old, this act laid out the legal basis for any property affected by a project and for compensating the effected owners of the land.

3.12 Factories Act, 1934

The clauses relevant to the project are those that concern the health, safety, and welfare of workers, disposal of solid waste and effluent and damage to private and public property. The Factories Act also provides regulations for handling and disposal of toxic and hazardous materials. Given that construction activity is classified as ‘industry’, these regulations will be applicable to the project contractors.

3.13 Labor Laws

Construction and operational activities during the course of construction may affect occupational health of workers. Employers are required to abide by labor laws in respect of their own employees and also to ensure that contractors to follow the relevant labor laws and rules relating to safety of the workforce and creating a healthy working environment. The proponents shall ensure that the

labor force engaged at the project site is not exposed to any danger by monitoring the contractor's work frequently.

CHAPTER 4: DESCRIPTION OF THE ENVIRONMENT

4.1 GENERAL

The existing environment around the site of proposed project has been studied with respect to physical, ecological and socio-economic resources. The existing information to establish a database for the EIA of the project was collected from different departments, review of previous studies and through the site visits carried in out in the project area.

4.2 PHYSICAL ENVIRONMENT

The study examines the physical resources, topography, soil, climate, surface and ground water and geology is of not only the project site but also the city as whole to assess whether the project under review can or does impact on any of these parameters. The description of physical environment of District Faisalabad and the project site is present in the following sub sections.

4.2.1 Geological Formation

The district of Faisalabad is part of the alluvial plains between the Himalayan foothills and the central core of the Indian subcontinent. The alluvial deposits are typically over a thousand feet thick. The scalloped interfluves are believed to have been formed during the Late Pleistocene and feature flat-topped river terraces. These were later identified as old and young floodplains of the River Ravi on the Kamalia and Chenab Plains. The old floodplains consist of Holocene deposits from the River Ravi and Chenab.

The soil consists of young stratified silt loams or very fine sand loams which gave the subsoil a very weak structure with common kankers at only five feet. The course of the rivers within Faisalabad are winding and often subject to frequent alternations. In the rainy season, the currents are very strong. This leads to high floods in certain areas

which do last for a number of days. The Rakh and Gogera canals have encouraged the water levels in the district however the belt on the river ravi has remained narrow. The river bed does include the river channels which have shifted the sand bars and low sandy levees leading to river erosion.

Faisalabad is situated at the centre of the lower RachanaDoab, the area is located between the Chenab and Ravi rivers. There is on a mild slope from the north-east to the south-west with an average of 0.2-0.3 meter fall per kilometre which is equivalent to 1-1.5 feet per mile. The city is situated at an elevation of about 183.35 meters (equivalent to 612 feet above sea level). The topography is marked by valleys, local depression and high ground.

4.2.2 Climate

Faisalabad has been classified as a hot desert climate. The climate of the district can see extremes, with a summer maximum temperature of 50°C (122°F), and a winter temperature of −2°C (28°F).

Fog is very common during winter. District Faisalabad mostly experiences stable winter but westerly and north-westerly winds sometimes blow. Summer is highly humid and most of the area's rain falls during the monsoon season from July to September. During winter season there are very little rains, however, deluges and floods can occur in some area of the district which are adjacent to rivers.

The weather in the city is monitored by the Pakistan Meteorological Department. The Pakistan Meteorological Department regularly provides forecasts, public warnings and rainfall information to farmers with the assistance of the National Agromet Centre.

Weather	Months
Autumn	
Winter	November-March
Spring	March-April
Summer	April-October

Monsoon	July-September

Seasons in Faisalabad

4.2.3 Temperature

The mean maximum and minimum temperature in summer are 39°C (102°F) and 27°C (81°F) respectively. In winter temperatures tend to peak around 17°C (63°F) and 6°C (43°F) respectively.

4.2.4 Rainfall

Average annual rainfall is approximately 384.683 mm (15.145 in), and highly seasonal, with nearly half of all precipitation occurring in July and August. Record-breaking rainfall of 264.2 mm was recorded on 5 September 1961 by the Pakistan Meteorological Department. Observations from the Meteorological Observatory at the University of Agriculture indicate that overall rainfall levels in the city have increased by 90.4 mm over the course of thirty years.

4.2.5 Topography

Faisalabad is 184 metres (604 ft) above sea level and is situated in the rolling flat plains of northeast Punjab between longitude 73°74 East, latitude 30°31.5 North. The city proper comprises approximately 1,230 square kilometres (470 sq mi) while the district encompasses more than 16,000 square kilometres (6,200 sq mi). The Chenab river flows about 30 km to the northwest, and the Ravi river meanders 40 km to the southeast. The lower Chenab canal provides water to 80% of cultivated lands making it the main source of irrigation. Faisalabad is bound on the north by Chiniot and Sheikhupura, on the east by Sheikhupura and Sahiwal, on the south by Sahiwal and Toba Tek Singh and on the west by Jhang.

4.2.6 Wind Direction

The Faisalabad region experiences westerly and north westerly winds during the winter and spring seasons, known usually as the dry stable times of year and southerly and south easterly winds during summer and monsoons. Wind speeds are low during winter picking up during spring season and peaking during the summer months. The

prevalent wind speed ranges from 10-25 km/h, however on some days, there appear storms of 60 km/h.

4.2.7 Ambient Air Quality

Atmospheric pollution means the imbalance in the normal air chemistry. It can occur due to the addition of a new chemical into atmosphere or by the change in concentration of the chemicals already existing in the atmosphere. Atmospheric pollution particularly in urban area has a strong impact upon daily life. The reasons of such changes can both be natural as well as anthropogenic. Ambient air quality is a key to measure the concentration of the various chemicals in atmosphere; especially of the chemicals which pose detrimental effects on health, safety and environment, to have a comparison with their safe concentrations, as established in WHO Standards and NEQS.

Faisalabad is the third largest city of Pakistan. Its economic growth, industrial progression &transport have peaked to grounds responsible for growing energy consumption leading ultimately to the consequences of increase in air pollution. The main sources of air pollution are exhaust from motor vehicles and industries. The main exhaust gases include SO2, NO2, CO, etc. Particulate Matter (PM) and noise are inspected as the pollution indicators. Faisalabad experiences the values of a few of these pollutants in excess of National Ambient Air Quality Standards near the industrial establishments but PM concentration exceeds the standard value in almost the entire of Faisalabad.

It was observed during the visit that Petrol and Diesel operated vehicles are emitting smoke and exhaust gasses in excessive quantity which are the leading sources of environmental pollution and are responsible for the air quality worsening. In fact, exhaust emissions (including dangerous gases such as carbon monoxide, oxides of nitrogen, hydrocarbons and particulates) and Evaporative emissions (including vapors of fuel which is released into the atmosphere, without being burnt) are the prime reasons of deterioration of air quality.

4.2.8 Water Resources

The Water and Sanitation Agency, commonly known as WASA, which is a subsidiary of Faisalabad Development Authority (FDA), provides about 72% of the city with sewerage services and about 60% with water services.

- **Surface Water**

  There is no surface water reservoir available near the project site.

- **Ground Water**

  The city of Faisalabad is underlain by the deep permeable aquifer formed within the

  alluvial plane of the River Ravi and Chenab, which is the part of Greater Indus Plain. Ground water is the principal source of municipal water supply in Faisalabad. This is also the case in the immediate vicinity of the site. The City's drinking water is obtained from groundwater aquifer by means of tube wells located throughout the area. Groundwater is pumped from 400-800 feet and is generally good for direct consumption. About 83% of the city's population is consuming groundwater for drinking purposes.

  Sample of groundwater was taken and analyzed for six parameters of significance with reference to groundwater quality. The pH of the water sample was almost lying in the neutral range; 7.37. High salinity and sodicity was indicated in the groundwater. Alkalinity and hardness of water was lying within the permissible limits.

4.2.8.1 Drinking Water Quality

WASA (Water and Sanitation Agency) Faisalabad is providing drinking water to the residents of Faisalabad. WASA claims the quality of water conforms to the Drinking Water Standards. The increase in population will have direct impact on the water sector for meeting the domestic, industrial and agricultural needs. Pakistan has now essentially exhausted its available water resources and is on the verge of becoming a water deficit country. The quality of water supplies in many cities of Pakistan is waning fast. Over pumping of groundwater due to extended drought is however affecting the water quality adversely.

4.2.9 Noise Level

The Noise level was found in the range of 45 - 60 dB(A) at day time which complies with the permissible limit of NEQS residential cum commercial areas.

4.3 BIOLOGICAL ENVIRONMENT

Biodiversity is the degree of variation of life. It is a measure of the variety of organisms present in ecosystems. This can refer to genetic variation, ecosystem variation, or species variation (number of species) within an area. Ecological data presents the entire detail of the biological parameters of the project area; i.e. flora and fauna of the area; specifically mentioning the endangered plant and animal speciesand the prevailing vector organisms and pathogens (if any) in the project area.

Faisalabad is enriched with the presence of natural flora and fauna; although with the growing population and development activities, the presence of some has been somewhat affected. Flora comprises primarily of amaltas and arocaria and animals found include dogs, cats and grazing animals.

There are however no significant or well-shaped trees and shrubs on the project site. There are some trees only along the main roads.

Livestock is also a very a very important part of the ecological characteristics or biodiversity of an area because of the manifold benefits harvested from livestock. Before the advent of the irrigation system and the irrigated agriculture, the area surrounding Faisalabad was a tropical thorny desert. Jand, peeloo, dailay, karir,kikar and beri are said to be the indigenous trees of this region, akk, bathu, mallah and thohar were the indigenous shrubs and herbs and indigenous grasses include dab, aristida, rohela, munj, panicum, cenchrus, penatropis, mascura and lasiurus. Most of these have become extinct or are endangered or rarely found. Only kikar, beri, akk, bathu, dab, munj, panicum and penatropis are among the prevailing species. After canal water system was developed and was being used for irrigation, a long list of exotic trees were introduced trees, shrubs, herbs and climbers was introduced in this region which successfully became a part of the local ecosystem. Since the list is very long, only the exotic trees have been mentioned. These include shisham, date palm, mango, eucalyptus, pipal, burr, neem, simal, bischofia, paper mulberry and mosquette. The entire flora mentioned here has almost all been written in native language of the area.

4.3.1 Flora

Trees, also called the ‘lungs’ of the earth, are important for the restoration of the eco-system. People can benefit immensely from their survival and existence. Trees have

also been a source of medicine for thousands of years and a refuge for various species of birds. Several species of the trees in Faisalabad are being used in medicines. Some trees of significant medicinal value are grown easily in the city.

Inventory of some Flora of Faisalabad

S.no	Common Name	Scientifc Name
1	Indian Lilac	*Azadirachtaindica*L.
2	Chinese date	*Ziziphusmauritiana*Lamk
3	Yellow	*Terminalia chebula* Retz.
4	Temple plant	*Crataevaadansonii* DC.
5	Bombax	*Bombaxceiba* Linn.
6	Bistula	*Cassia fistula* Linn.
7	India laburnum	*Acacia nilotica*(Linn.)Delile.
8	Indian banyan	*Ficusbenghalensis* Linn.
9	Buddha tree	*Ficusreligiosa* Linn.
10	Benzoil tree	*Moringaoleifera*Lam.
11	Devil tree	*Alstoniascholaris*(L.) R.Br.
12	Rosewood	*Dalbergiasissoo*Roxb.
13	Mango	*Mangiferaindica* L.
14	Spanish cherry	*Mimusopselengi* L.
15	Jujube	*Ziziphuszizyphus*Mill.

Right now there are no significant or well-shaped trees and shrubs at the proposed site except for grass (*Cynodondactylon*) and wild bushes.Therefore there is no adverse impact on the flora**.** There is no Reserve Forest in the 5km radius of concerned site. No threatened or endangered species and no medicinal plants are present in the proposed area. However they are planning to plant few plants in the proposed area for the environmental and aesthetic value.

4.3.2 Fauna

Insects hazardous for the flora experienced in the area include post beetles, lady bird beetles and white ants. Rodents like hair, rats and porcupines are also common. Fomesbadius is a prevalent fungal colony. Mole rat, house rat and geese/house shrew are the prevailing mammals within and around the project area, brahmini kite, black kite and white breasted king fisher are dominant prey birds, dove, larks, weaven bird, indian sand martius, indian river tem, black partridge, common babbler and wood pecker are prominent seed eating birds, sun bird, owl, tree pies, fly catcher, myna, bee eater, miniwits, black rock pigeon, quail and ababeel are common terrestrial birds, dark bellied marsh snake, indian monitor lizard and common house lizard are reptiles commonly reported, toads and frogs are amphibians that commonly occur and honey bee, mosquito, house fly, ants and butterfly are popularly known insects in Faisalabad.

Inventory of some Fauna of Faisalabad

S.no	Common Name	Scientific Name
1	Intermediate Egret	*Egretta intermedia*
2	Indian-Pond Heron	*Ardeolagrayii*
3	Red-Wattled Lapwing	*Hoplopterusindicus*
4	Common Sandpiper	*Actitishypoleucos*
5	White Wagtail	*Motacilla alba*
6	Yellow Wagtail	*Motacillaflava*
7	Red-vented Bulbul	*Pycnonotuscafer*
8	House Sparrow	*Passer domesticus*
9	Common Myna	*Acridotherestristis*
10	Bank Myna	*Acridotheresginginianus*
11	Pied Myna	*Sturnus contra*
12	House Crow	*Corvussplendens*
13	Nectariniaasiatica	*Purple sunbird*
14	Black Drongo	*Dicrurusmacrocersusvieillot*

15	Black kite	*Milvus migransmigrans*
16	Blue rocky pigeon	*Columba livia*
17	Little brown dove	*Streptopeliasenegalensis*
18	White-breasted Kingfisher	*Halcyon smyrnensis*
19	Little Green Bee eater	*Meropsorientalis*
20	Golden-backed woodpecker	*Dinopiumbenghalense*
21	Hoopoe	*Upopaepops*
22	Pheasant-tailed jacana	*Hydrophasianuschirurgus*

Some birds and few animals like Buffaloes, cows, goats, donkeys, hens, rats, cats and dogs are present in the vicinity of proposed site. Some reptiles like lizards are also present. The only amphibian seen the project area is frog. No threatened or endangered species are found in the project site. Similarly no wildlife is present.

4.4 SOCIO ECONOMIC ASSESSMENT

Social change is the consequence of almost any intrusion into the community life of any society. The intrusion can be in the form of any developmental projects or nonspecific, less tangible forms such as increased exposure to other cultures, technological changes and so on. The social change that results from intrusion into community life can also be beneficial, but can have undesirable or negative outcomes. Even that change in the long run may have positive effect on the social well being of a community.

Social Impact Assessment is a methodology used for examining social change due to external sources, especially specific developmental projects, but also government policies, technological changes and social processes or anything that has a social impact.

The objectives of the given study are outlined as follow:

- To carry out the assessment of social impact.
- Acquire socioeconomic data to evaluate and identify the project interventions.
- Assess needs of community related environmental concerns.
- To assess adverse and beneficial socioeconomic and health impacts of the activity.
- To suggest remedial measures and solutions to improve socio economic conditions.
- To analyze socio economic conditions of community, with special reference to environment and conservation of natural resources.

4.4.1 Demographic Profile of Faisalabad

LPopulation residing in the selected area belongs mostly to the labor community; involved in small govt. and private labor works. The areas is under-developed. Most of the people in the nearby communities, though not highly educated, depend on jobs of various natures for their earning. Some people also run small shops. Average income ranges from PKR 12000 to 30000. People exercise different family setups,Average family size is 5-9 members. 96% of the population is Muslim, Urdu and Punjabi are the most dominant languages spoken in the region however few respondents could understand and speak English. Hospitals and dispensaries as well as schools and colleges are in easy access of the people, and disease rate is very high because of the unavailable sewerage network and open sewage disposal besides the contaminated groundwater available for drinking and other purposes.

4.4.2 Health facilities

Health care services are provided to the citizens by both public and private sector hospitals. The government run hospitals are Allied Hospital, District HQ Hospital, Institute of Child Care, PINUM Cancer Hospital, Faisalabad Institute of Cardiology (FIC) and General Hospitals in Ghulam Muhammadabad and Samanabad. There are also a number of private hospitals, clinics and laboratories in the city, notably Al-Rahmat labs, Mujahid Hospital lab, National Hospital lab & Agha Khan lab. The City

District Government also has a number of basic health units, rural health centres and dispensaries to provide care for its people in the rural parts of the district.

4.4.3 Educational Facilities

The population of Faisalabad has a literacy rate of approximately 60%, with a split of 69% for males and 46% for females (all figures are higher than the national average within the country).Faisalabad has several research and educational institutions, both public and private, such as the University of Agriculture, Government College University, National Textile University, Nuclear Institute for Agriculture and Biology, University of Faisalabad, and the University of Engineering & Technology of Lahore. In 2014, the University of Agriculture ranked 1st in agriculture and 4th overall for universities in Pakistan according to the Higher Education Commission of Pakistan (HEC), and was ranked 142nd in the 2013 Top 200 World Universities for agriculture and forestry by Quacquarelli Symonds (QS).The education system is monitored by the District Education Officer of the City District Government of Faisalabad. The city government reports its findings to the Ministry of Federal Education and Professional Training and the Minister for Education (Pakistan). Funding is provided by the Government of Punjab, Pakistan, City District Government and the fees collected from schools. There are four levels of the education system in the city: Primary, Elementary, High and Higher Secondary Level. Primary level education is only compulsory. There are also a number of schools for the assistance of children with special needs.

4.4.4 Transportation and Communication

There are many ways to get in and around Faisalabad. The majority of roads are under the control of the National Highway Authority (Pakistan), linking Faisalabad with other cities of the country. The roads meet international standards and have improved logistical networks for freight companies. Important national highways and motorways passing through Faisalabadincude: The Grand Trunk Road, The M3 motorway (Pakistan) and The M4 motorway (Pakistan). Public transportation in Faisalabad includes auto-rickshaws, buses, coaches and railways. An international airport on the outskirts of the city operates flights to the Middle East.

4.4.5 Industrial Activities

La

4.4.7 Water Supply

The Water and Sanitation Agency (WASA) provide the drinking water. The existing production capacity of WASA is 65 million gallons per day, almost all of which is drawn from wells located in the old beds of the Chenab river. From the wells, water is pumped to a terminal reservoir located on Sargodha Road. Water is normally supplied for a total of about 8 hours per day to the majority of the city.

4.4.8 Electric Supply

LESCO

4.4.9 Telephone Facilities

Landline and Cellular telephone facilities arepresent in the area and proposed site will purchase their own landline service for the office and factory.

4.4.10 Sites of Historical Significance in Faisalabad

Faisalabad is the second largest city in the province of Punjab. It is an epicenter for trade and has gained much popularity for its colonial heritage sites. Faisalabad Arts Council is a Divisional organization of Punjab Arts Council under the Administrative Control of Information, Culture & Youth Affairs Department, Government of Punjab. It was established in 1982 and the present building was completed in 2006. It is named after qawalNusratFateh Ali Khan (Late). Now housed at the NusratFateh Ali Khan Arts Auditorium and its museum in 2011.

The building was designed by well-known architect Mr. Nayyer Ali Dada. The Faisalabad Arts Council is chaired by Commissioner, Faisalabad Division and Headed by Resident Director.

Faisalabad is home to a number of parks and majority of them are maintained by the Parks and Horticulture Authority. Jinnah Garden is known as the oldest and central park in the city, commonly known as “Company Bagh”. The monument of Sir Charles James Lyall is situated here. The Chenab Club is located in the surroundings of Jinnah Garden, which was built during colonial rule. The park contains a Pakistan Air Force F-86 Sabre, several fountains and colonial pavilions.

Canal Park, on the west bank of the Rakh Branch Canal, is a newly opened park for families. The Gatwala Wildlife Park is a botanical natural reserve located at Gatwala that was renovated by the city district government. The Pahari Grounds near D Ground is also another park that has undergone renovation and a Pakistan Air Force F-86 Sabre is also on display here.

There are two libraries that are open to the public: Allama Iqbal Library and Municipal Corporation Public Library. They are funded and regulated by the Government of Punjab, Pakistan under the service sector.

Allama Iqbal Library is located on University Road, opposite the District Courts. The library is housed in the 1911-built colonial building originally named "Coronation Library" during the rule of the British Empire. In 2012, the building came under control of the Lyallpur Heritage Foundationand the Punjab Archives and Libraries Department. Membership is open to all - with 500 rupees joining fee and one proof of identification.

Lyallpur Museum is located adjacent to the Allama Iqbal Library on University Road. It is a heritage museum and art gallery open to the public. The museum is primarily focused on regional history with a collection of artwork, artefacts and photographs.

Municipal Corporation Public Library is located on Narwala Road opposite the historical grounds of Dhobi Ghat. The library has a large collection of books, a photo gallery and a conference centre. In 2011, the library underwent a renovation costing 40 million rupees.

The Forest Library at the Punjab Forestry Research Institute (PFRI) is one of two specialist libraries, the other being in Lahore. Opened in 1986, the research library is based at the Wildlife Research Center in Gatwala.

4.5 SOCIO ECONOMIC ENVIRONMENT

Socioeconomic environment is represented by the human and economic development and quality of life values. For the study of socio-economic environment of the project area, field surveys were conducted and interviews were held with the general public and neighbors.

4.5.1 Conclusion

Comparison of potential adverse and beneficial impacts of the project shows that project will prove to be beneficial for the inhabitants of the area. The project will provide job opportunities for the local inhabitants. Hence improve their socio economic status. Employment opportunities generated by the project will include workers, helpers and guards. The overall socio economic impact of the project is interpreted in relation to the existing environmental conditions.

The project, overall, does not have major adverse impacts on the existing environment and people with due implantation of the mitigation measures, there will be very insignificant adverse impacts on the socio economic environment. The project has more beneficial impacts on the socio economic environment than adverse impacts. In conclusion, it can be said that overall the project would have positive impacts on the socio economic status of the neighboring community inhabitants.

CHAPTER: V

SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

The potential environmental impacts related to the project have been studied in context of construction and operational phase of the project. Environmental protection measures are recommended to eliminate adverse impacts on environment or to reduce them to an acceptable level within the prevailing legislative and regulatory framework, although proposed plant has all mitigation measures and all conditions are environment friendly. These impacts are evaluated on the basis of magnitude, immediacy and sustainability. A careful consideration of project aspect, their potential environmental impacts and mitigation measures are proposed in this chapter. Evaluation criteria are as follow:

- Magnitude: Type of impact (direct, indirect, and cumulative)

- Immediacy: Temporal extent (during construction, after construction)
- Spatial extent: (local, widespread)
- Sustainability and Reversibility: Mitigability (fully, partially)
- Monitoring (fully, partially)

Environmental Problems Due to Project Location

Environmental impacts due to project location have been studied and adequate mitigation measures have been proposed.

Table 5.1: Environmental Problems/Mitigation Measures Due to Project Location

	POTENTIAL IMPACTS	MITIGATION MEASURES
1.	**Change in Land Use Pattern**	
	Any new intervention has its first and foremost impact of changing the land use pattern of the area. The impact of this nature is irreversible therefore site selection needs to have careful consideration of the impacts that may arise due to the changes in land use patterns.	The most essential factor adding to the feasibility of the project site was that it is within the battery limits of the industrial cluster thus reducing any energy loss in the transmission of electricity. In addition, current land use price and comparatively less environmental impacts associated with the location reinforce the feasibility of the site selected.
2.	**Pressure of Resources**	
	Yet another impact to be considered prior to site identification is the availability of already existing resources e.g. water, gas, electricity, etc. any new intervention can exert pressure and marginalize the existing community. This could eventually create a sense of deprivation among the already existing community and may eventually result in social unrest.	Considering this very important factor, the site identification was done after evaluating the extent of provision of resources. The water requirements, energy requirement, social services can be approached easily. The current location has also adequate resources for example gas, electricity, access roads alongside manpower with required skills and education being in the industrial cluster. The main pressure of resources at the project site is availability of raw material for the

		project which project towards suitability in regard of production.
3.	**Natural Hazards**	
	It is very important to assess the extent of damage any natural hazard e.g. earthquake, floods, landslides may cause. The geological formation of the capital territory is such that it has been categorized into earthquake zones.	The site identified within environmentally /geologically safe and does not fall in any of the earthquake zones in which the capital territory is divided.
4.	**Displacement of Local Community**	
	Displacement of local community can tend to create social issues and aggravate negative feelings from the existing population towards the project.	The project is planned on a site which has already been acquired by the proponent. The land surrounded by industrial units that does not require any displacement of local community.
5.	**Accessibility Issues to the Local Community**	
	Another important impact considered was obstruction or changes in the patterns of transportation and increase travel time/distance for the local community.	The project site is surrounded by industrial cluster and it is an already constructed industrial infrastructure thus does not involve damage to any roads. Nature, size and scope of work also limit the extent of activities during operational phase.
6.	**Presence of Sensitive Areas**	
	Development interventions can degrade the quality and life expectancy of ecologically, socially and historically sensitive areas.	There are no sensitive areas of any nature (ecological, social or historical) in the project area.
7.	**Availability of Existing Infrastructure and Services**	
	Unavailability of infrastructure can render the entire project void and impractical due to absence of important community infrastructure.	The project is well connected to the rest of the city through roads e.g. main road and health facilities to workers and also for the local people, and transport facilities available hence

		making the location ideal for the said purpose.

5.1 Environmental Problems Associated With Project Construction & Operation

provides a detailed overview of the environmental aspects and subsequent environmental impacts that may arise during project operational phase. Appropriate mitigation measures are also proposed for the remedy of any such potential impacts.

Table 5.2: Environmental Impacts/Mitigation Measures during Construction & Operational phase

	POTENTIAL IMPACTS	MITIGATION MEASURES
1.	**Solid Waste Management**	
	Improper and unplanned solid waste dumping can cause environment, health and safety issues. It also can potentially deteriorate the living quality of the residents besides reducing the aesthetic quality of the entire scheme.	Solid waste generation from the construction activity and domestic sources will be disposed of properly. The solid waste from the construction activity will be re-used. As for domestic waste, at site there is already has a waste disposal system for handling of solid waste. SW Manager will be hired who will take care for all system regarding solid waste at the project site during construction and operational phase. The operational phase of the project will not produce any solid waste except domestic which will comprise on wrappers, papers etc. company has signed MOU with waste Management for the collection and the disposal of all kind of the solid waste.
2.	**Wastewater Disposal**	
	Wastewater generated due to domestic/process activities result in the spread of vector borne diseases like dengue, malaria, as well as spread the nuisance of foul smell.	Wastewater during construction phase will be reused like for soil sprinkling and construction material making etc. The wastewater produced in the operation phase will be re-used within the project cycle. The domestic wastewater will treated by a septic tank already present within the premises of proposed plant. For further medical waste compny had contract with waste for the collection and disposal of the waste generated during

		operational phase.
3.	**Energy Conservation**	
	Excessive use of energy exerts more pressure on the already dwindling energy resources of the city/country.	Proponent is committed to install energy efficient machinery and equipments by implementing the modern technologies. Thus there is no fuel requirement and does not put pressure on the existing resources.
4.	**Noise Generation**	
	Noise emissions due to traffic and any activities create issues to the residents.	Any activity that leads to noise pollution is restricted. Noise suppression canopy will be installed over the machinery/equipments instruments to reduce the noise pollution. Modern technologies ensure the standards with the international standards of the noise pollution. In order to keep noise within the limits set under PEQs, the proponent will ensure regular monitoring by using the EPA approved methods, EPA certified laboratories will be involved in this regard. Records of monitoring will be maintained and shared with the EPA.
5.	**Emergency/Fire Hazards**	
	Emergencies e.g. fire incidents may lead to environmental, health and safety issues to the local residents.	During construction phase all emergency conditions will be prepared like fencing around the construction site etc. Emergency preparedness plans will be prepared for the operational phase. Call points at suitable locations are also mentioned because being in the industrial cluster. But during the operational phase the emergency preparedness plan is attached with annexed.
7.	**Training of Staff**	
	Unskilled persons are not able to tackle environmental, health and safety related situations which may further aggravate any such issues and cause loss of human life and property.	Regular training of the staff will be conducted. Proper monitoring and reporting mechanism is developed where the team is responsible to communicate/report any illegal or hazardous situation to the team leader.
8.	**Social Impacts**	

	Problems regarding privacy of local community may arise due to invasion of outside population.	Though the chance of any improper social conduct are negligible due to the fact that the project site is an inside the industrial cluster. However, having a proactive approach, improper social behaviors e.g. staring and teasing is discouraged and any such incident report directly to the site in-charge. Workers will be hired from the local community to avoid social issues.
9.	**Transportation**	
	Transportation of raw material for safety stuff manufacturing to and from the project site creates a probability of accidental spills and fire.	Transportation vehicles keep maintain in good conditions to avoid the chances of accidents. Demarcation of proper area onsite for parking of construction vehicles. During construction as well as of operational phase, vehicles will be entered into the project site according to schedule and need. Being in the industrial zone ther is a demarcation and proper plan of incoming and outgoing of the vehicles.
10	**Terrestrial biodiversity**	
	Development should not disturb the biodiversity because biodiversity are the precious elements of the area	Following measures will be adopted in favor of biodiversity of that area. Project site is in industrial cluster and an open plot where there is no biodiversity .Adopting a vegetation program that uses indigenous stocks of local vegetation. Proponent is committed to plant the 3000 plants during installation of plant while 2500 during operation of plant.
11	**Health and safety**	
	Health and safety parameters are the key necessities of the any project in which minor negligence can have damage.	Following mitigation measures will be adopted; ➢ Enforcing site security ➢ Ensuring site safety ➢ Enhancing safety at site facilities ➢ Establishing environmental controls ➢ Regulating transportation on-site

12	**Emergency preparedness plan**	
	Emergency preparedness plan is fundamental factor of any project site so that in case of any emergency conditions can be tackled.	For emergency preparedness plan there will be fire hydrants and fire extinguishers at certain points.
13	**Socioeconomic**	
	Socioeconomic factor comes in priority parameters because it's about surrounding people income.	By reducing socioeconomic problem following measures should be adopted; The site is in industrial zone but still the proponent is committed to give job opportunity to the locals of the area. ➢ Reducing potential exposure to emissions.

5.2 Risk Analysis Matrix

The impact associated and their risk score was calculated for each impact type to get an overall probability of severe impact that the project might cause during any stage of its existence. The stages have been categorized according to the guidelines and the Risk Analysis Matrix method has been employed to obtain the overall impact in terms of probability, likelihood, severity and overall magnitude of impact.

Table 5.3: Risk Analysis Matrix

Potential Impacts	**Magnitude**	
	Without EMP	**With an EMP**
Air quality	**---**	**-/0**
Waste generation	**---**	**-/0**
Traffic	**--**	**-**
Noise	**--**	**-**
Surface and water quality	**--**	**-/0**
Soil quality	**--**	**-/0**
Terrestrial biodiversity	**--/+**	**-/++**
Resource use	**--**	**-**

Health and safety	---	-/+
Landscaping and visual inspection	---	-/+
Socioeconomic	-/+++	-/+++

+++ High Potential Positive Impacts **--- high potential negative impact**

++ moderate potential positive impact -- moderate potential negative impact

+ low potential positive impact - low potential negative impact

0 Neutral impacts

Social Enhancement Measures

Socio-economic enhancement measures taken by Pioneer Cement Limited are described below

Health and Safety Program

Health and Safety will be one of the top priorities at M/s Krypton Pharma (Pvt.) Ltd., and as a socially responsible organization, they actively seek to impart their best practices in the communities they operate in. The program aims to build awareness among students and faculty members in key area of Health & Safety (H&S) in an engaging manner, and encourages creating a Healthy and Safe culture in the schools.

The program aims to educate and build awareness among school children of all ages, particularly in areas of:

- Safety on Road
- Safety at Home
- Safety at School
- Internet Safety
- General Health and Hygiene

The program includes creating awareness and educating particularly on road safety, health (hygiene and prevailing diseases), firefighting and S.M.A.R.T. usage of internet.

Health safety and Environmental Manual is attached in Annexure.

Additional Considerations

It is very importance to plan a project after evaluating its cumulative socio-environment and cultural impacts. The project is a unique venture in the identified locality as it will address the environmental, social and safety issues through estabilishing norms of operating within the area. The project is planned after keeping all the parameters of environment, health and safety for site identification, and operational phase. That's why the cumulative impacts of the project are negligible.

CHAPTER 6: ENVIRONMENTAL MANAGEMENT & MONITORING PLAN

GENERAL

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

Outline and key features of the EMP for operations phase is presented. 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.

PURPOSE AND OBJECTIVES OF THE EMP

The primary objectives of the EMP are to:

- Facilitate the implementation of the mitigation measures identified in the EIA.
- Define the responsibilities of the project proponent and staff.
- 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.

MANAGEMENT APPROACH

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

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

Contractors: The contractors will implement the majority of environmental and social mitigations. The contractors will carry out field activities as part of the project.

The contractors are subject to certain liabilities under the environmental laws of the country, and under its contract with proponent.

ENVIRONMENT MANAGEMENT PLAN FOR CONSTRUCTION PHASE:

It lists all the mitigation measures identified in the IEE and the associated environmental or social aspect in line with the administrative framework involving all the responsible implementing authorities who are required to take the planned actions/measures.

Table 6.1 environment Plan (EM)

Environmental and social aspect	Measures	Responsibility
Construction Noise control plan	Periodic surveys will be conducted for the control of noise level from the sites where machinery will be installed. Workers on high noise machines will be provided with PPEs (ear plugs, ear muffs). Machines will be equipped with mufflers. Other noise control measures will be implemented	Administration/ construction Contractor
Dust emission control	During proposed project work of Pharmaceutical Plant involving construction, Water will be sprinkled on all the exposed sites to suppress the emission of dust whereas during installation of equipments & machinery, there will not be dust emission so on mitigation required	Administration/ Construction contractor
Vehicle and equipment exhaust control	All vehicles and other equipment used during the construction & installation will be tuned and maintained in good	Administration/ Construction

	working condition in order to minimize the emission of pollution	Contractor
Water conservation plan	Groundwater being extracted for construction activities of Proposed construction project would be recorded, where possible, water would be recycled	Administration
Community Safety Plan	Fence surrounding the site will be put in on during the construction to prevent assesses. All entry points into the site will be staffed 24 hours a day with guards. No machinery will be left unattended particularly in the running condition.	Administration
Worker's safety plan	SOPs will be established for all activities on the site, workers will be trained and guided to follow SOPs and will be provided with necessary PPEs wherever required. Careful monitoring will also be carried out.	Construction contractor
Soil contamination	During construction vehicle activities, Spills trays will be provided and used at refueling locations. Emergency plan for the spill management will be prepared and inducted to the staff for any incident of spill. Fuel, lubricants and chemicals will be stored in the covered bounded area	Construction Contractor

ENVIRONMENTAL MONITORING PLAN

Environmental monitoring is a vital component 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. The main objectives of the environmental monitoring during the construction phase will be.

- To provide a mechanism to determine whether the project construction contractors are carrying out the project in conformity with the EMP.
- To identify areas where the impacts of the project are exceeding the criteria of significance and, therefore, require corrective actions.
- To document the actual project impacts on physical, biological and socio-economic receptors, quantitatively where possible, in order to design better and more effective mitigation measures.

Following environmental record should be maintained:

- Periodic inspection reports of the site.
- Audit reports
- Incident record of all moderate and major spills and other incidents and accidents.

  The record will include.

  - Location of spill or battery limit of the accident
  - Estimated quantity of the amount of injury (as may be reported in LTI or LWI)
  - Spilled material or nature of injury or loss (temporary or permanent)
  - Restoration measures.
  - Photographs
- Description of any damage to vegetation, water resource, or community asset.
- Corrective measures taken, if any.
- Waste Tracking register that will records of all waste generated during the construction period. This will include quantities of waste disposed, recycled, or reused.
- Records of water consumption with use wise breakdown.

Survey reports, in particular, the following:

- Vehicle and equipment noise.
- Ambient noise survey reports
- Ambient level of PM
- Vendor data – all vendors disturbed by the project and compensation paid.
- Public infrastructure. Record of all damages and repair work undertaken.
- Employment
- Total number of unskilled, semi-skilled and skilled jobs offered during Construction.
- Name and domicile of the employed staff.
- Project and Community interface
- Record of community complaints and the measures taken to address them.
- Number of meeting held in various communities and data of persons who attended
- Environmental and social training records.

Table 6.2: Roles and Responsibilities for environmental Monitoring

Aspects	Proponent Responsibilities	Contractors Responsibilities	Relevant Documentation
Contracting	Ensure that the monitoring requirements are included in the contract between the proponent and the construction contractor	Understand the requirements and correctly estimate and report the required resources	Contract between the proponent and the contractor
Monitoring plan	Finalize the monitoring plan prior to the		Revised monitoring plan

	commencement of the construction		
Resources	Ensure the availability of resources for environmental monitoring	Ensure the availability of resources for environmental monitoring and their efficient use without wastage	Project budget
Environmental staff	Designate an environmental manager for the project	Appoint officer dedicated to environment	Job description
Monitoring survey	Undertake the periodic (pre-planned) and unplanned) inspection and carry out the field measurement	Systematically observe and collect the data on the environmental performance	Inspection and survey reports
Environmental Audit	Conduct periodic audits of the construction site and commence third party audit	Conduct audits	Audit reports
Reporting	Ensure that periodic environmental monitoring reports are received		Periodic reports
Corrective action	Verify that activities are carried out complying with IEE/EMP	Carry out the corrective actions	Corrective action record
Maintenance of record	Maintain monitoring data and record of all	Maintain monitoring data and record of all	Environmental data base

	incidents of environmental significance	incidents of environmental significance	

Table 6.3: Environmental Monitoring

Potential activity and potential impact	Objective of monitoring	Parameter to be monitored	Measurements	Location	Frequency	responsibility
Disturbance due to noise from operational activity	To determine the effectiveness of the noise abatement measure on the sound level	Noise level near the receptor	Reading will be taken	At least three locations on the unit boundary and three locations at the receptor end	On three typical working days and one weekend	Environment Officer/ Manager
Waste collection storage and disposal	To check the availability of waste management system and implementation	Inspection of waste generation, collection, storage and disposal will be undertaken at each site of the project	Visual inspection	Construction on and operational site	Once daily	Environment Officer/ Manager

		activity				
Water and other resources conservation	To determine the effectiveness of the water conservation techniques in practice	Leakages, spillages and wastages	Visual inspection and record tracking	At all points of use	On monthly basis	Environment Officer/ Manager
Workers' safety	To check and evaluate the effectiveness of the workers' safety plan	Injuries	Injuries will be recorded	On site	Daily	HSE/ Construction contractor
Vehicle and equipment exhaust	To confirm the availability of exhaust control devices with the construction vehicles and equipment and their maintenance levels.	Air quality at different points around the vehicles and equipment	Readings will be taken	At least three points around the vehicles and equipment and three points at some distance downwind	On three typical working days	

ENVIRONMENT MANAGEMENT PLAN FOR OPERATION PHASE

This section outlines the aspects that will be covered in the EMP for the operational phase of the project, but also to enhance project benefits, and to introduce standards of good practice to be adopted for all project activities.

Table 6.4: ENVIRONMENTAL MANAGEMENT PLAN FOR OPERATION PHASE

Sr #	Project Component or Impact	Target	Action	Responsibility
1	Overall environmental impacts	To reduce overall negative impact of the project and structures on the environment and conserve natural resources	Should take all possible measures to ensure that operation of the project does not harm any component of the environment	Proponent/ Management
2	Noise & Vibration	To ensure that the noise levels do not exceed the limits and that the vibrations may not cause irreversible loss	Put silencers on the machines Isolators should be made for the absorption of vibrations. Noisy machines should not be operated in night shifts. Workers should be told and encouraged to use PPE's (ear plugs or ear muffs). Proponent has planned a proper plantation plan which	Proponent/ Management

			will also act as barrier for noise. Workers should be regularly advised on importance of water conservation so as to preserve water Water balance should be tracked and recorded.	
3	Water Conservation	To conserve water	Water of a supply will be used for the designated like the fire water only for fire control Water leakages should be repaired on immediate actions	Proponent/Management Committee
4	Wastewater management	To avoid pollution of the water body to which the process wastewater is to be drained and its after-effects.	Water after use will not be drained, It will be recycled. Municipal wastewater will be drained after passing through a Septic Tank. Reuse and recycle attempts will b made for all sorts of	

			wastewater	
5	Air Quality	To ensure that the pollutant levels in air do not exceed the limits	No waste should be burnt at the premises Boiler with double stage Fuel Gas, Scrubbing and filtration system will be installed which will remove 99.99% suspended particles and emissions values will be within the range of PEQS. Workers should be advised to keep their vehicles and machines in good working order to minimize emissions.	
6	Energy conservation	Conservation of energy and use of environmental friendly energy sources	Efforts should be made to ensure that energy is conserved and that environment-friendly techniques are adopted too. Plans should be made to bring renewable energy resources into use. Energy audits should be	Proponent/ Management

			conducted.	
7	Solid waste Management	To manage waste in an environment friendly manner	The solid waste from the project should not be allowed to pile up at the temporary storage site.	Proponent/ Management
8	Safety & Security	To secure the lives of employees and nearby area	All possible measures should be taken to maintain security at all times. All the risks and hazards will be identified and assessed before hand and control measures revised time to time. SOPs should be updated time to time and displayed Safety trainings should be made a part of company schedules.	Proponent/ Management
9	Emergency Response	To deal with any emergency efficiency	Company should have an emergency escape plan in place	Proponent/ Management
10	Environmental Monitoring	To ensure that periodic reports	A mechanism should be employed for Environmental	

		on environment at the project site are furnished to EPA in pursuance of conditions of the environmental approval	Monitoring at the project when it comes into operation	Proponent/ Management

COMMUNICATIONS AND DOCUMENTATION

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

MEETINGS

Two kinds of environmental meetings will take place during the project

- Kick-off meetings
- Weekly meetings

The purpose of the kick-off meeting will be to present the EMP to project staff and discuss its implementation and to discuss any event of environmental significance that has happened in the under-discussion industry or a similar industrial unit to investigate its route causes and develop its solutions. The purpose of the weekly meetings will be to discuss the conduct of the operation and environmental issues and their management. The proceedings of the meeting will be recorded in the form of a weekly environmental report.

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.

ENVIRONMENTAL TRAINING

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

Table 6.5: Training Program

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

MONITORING PLAN

The monitoring of the EMP and the communication and documentation mechanism that will be employed during the operational phase will be based on the Environmental Management system (EMS) of the project proponents and the certification and legal bindings. The management system of the project proponents will be the same at the certified EMS in place at the company.

Table 6.6: Environment Monitoring

Potential activity and	Objective of monitoring	Parameter to be	Measurement	Location	Frequency	responsibi

potential impact		monitored				
Disturbance due to noise from operational activities	To check whether the existing noise control measures are able to bring the sound level within prescribed limits.	Noise level near the receptor	Noise Measurement	At least three location on the plant boundary and three location at the receptor level	Quarterly	Environm Officer
Emission of exhaust gases and particulates which may pollute the environment	To determine the effectiveness of the air pollutants' abatement devices on the concentration of the likely pollutants	Source Emission parameter	PM and CO	Generator Exhaust	Monthly	Environm Officer/M
Disposal of waste water/effluent	To determine the NEQs compliance	Wastewater parameters	PH, Temp, BOD,COD,TSS, TDS, Copper. Chromium	If Disposed	Monthly	Environm Officer
Soil contamination due to leakage of oil and dyes/chemicals	To determine the effectiveness of the control measures taken	Procedure in place to handle the liquids and availability	Visuals inspections and availability checks	Unit, machinery and other aspects of places	After every three month	Environm Officer

on the ground	to minimize the spillage of oil and chemicals	of procedure and equipment for emergency response				
Waste disposal, procedure for waste collection, storage and disposal	To check the availability of waste management system and implementation	Inspection of waste generation, collection, storage, and disposal will be undertaken at each site of the project activity.	Visual inspection	Entire Unit	Once daily	Administr Officer
Safety	To check and evaluate the effectiveness of the workers' safety plan and availability and access of first aid facilities	Injuries	Injuries will be recorded	Entire Unit	Daily	HSE

CHAPTER 7: CONCLUSION

7.1 CONCLUSION

The report presents Environmental Impact Assessment (EIA) of the Proposed Project of Construction of Pharmaceutical Unit of M/s Krypton Pharma (Pvt.) Ltd.,. The main objective of this project is to manufacture high quality intravenous liquids to fulfill the demand of local market. The project shall contribute in the economic growth of the local community as well as the country and will also be helpful in providing high quality and affordable medical solutions to patients. Number of employment opportunities shall also be provided to the skilled, unskilled and highly qualified citizens.

The performed EIA showed all identified possible impacts (both positive and negative), associated with the project. Appropriate mitigation measures as explained in the environmental study shall reduce, if not eliminate, these impacts so that these are within acceptable limits. The study also shows that there will be no exploitation and consequential depletion of the local natural resources. Based on overall assessment of the environmental impact of the project, it is concluded that the project is not likely to cause any significant adverse impact on the social, physical and biological environment of the area, provided that suitable mitigation measures as identified in this study are implemented.

The Environmental Impact Assessment has been conducted to the extent possible, in line with relevant guidelines provided by the Environmental Protection Agency. The objective of such study is to identify and assess potential environmental and social impacts of the project. The EIA report contains 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.

It is further concluded that all potential environmental concerns associated with the project have been adequately addressed, and no further study is required in this context. 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

Following are some recommendations to improve the environmental status of the project:

- No activity should be undertaken at the site which could pose any sort of a threat to public health.

- Worker should be provided with masks (dust and chemical) ear plugs or ear muffs and other Personal Protection (PPEs), like mufflers, goggles, gloves and shoes etc.
- Separate parking spaces should be demarcated at the project site for parking of vehicles.
- Establishments shall be regularly advised to keep noise levels within acceptable limits.
- Waste minimization practices should be employed and workers should be encouraged to adopt such methods.
- Wages should be distributed on time.
- Wages should not be below minimum wages as prescribed.
- Workers should be told and encourage
- ed to use PPE's
- Proper ventilation can limit the amount of indoor air pollutants.
- 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 corner for proper waste collection and discharge.
- Obligatory insurance should be provided to work laborers against accidents.
- Basic medical training should be provided to the specified work staff and basic medical service and supplies to workers.
- Prohibiting flammable materials in the warehouse premises.
- Stop the source of the spill immediately.
- 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.