EXECUTIVE SUMMARY

INTRODUCTION

This executive summary presents an overview of the main findings of the Environmental Impact Assessment (EIA) report for a proposed project. M/s Indus-Valley Industrial Junction (Private) Limited has intended to construct an Indus-Valley Industrial Junction Special Economic Zone at Village Suri, Sub Tehsil Shahwali, Tehsil Rojhan, District Rajanpur, Punjab. Mix use project in which comprise of infrastructure works including pavement, structures like retaining walls, Culverts, underground water tanks, Septic Tanks, Treatment Plants, residential villas, multi-story buildings, Hotels, educational Institutes and hospitals etc. The wastewater treatment and solid waste management practices are well planned along with mentioned objectives. The ultimate purpose of the assessment is to obtain an Environmental Approval by fulfilling all the legal requirements set under Punjab Environmental Protection Act, (Amended 2012) 1997.

The SEZ Act was promulgated on September 13, 2012 and later this year the SEZ Rules were notified. The law provides SEZs to be set up by the Federal or Provincial Governments themselves or in collaboration with the private sector under different modes of public-private partnership or exclusively through the private sector. The fiscal benefits under the SEZ law include a one-time exemption from custom duties and taxes for all capital goods imported into Pakistan for the development, operations and maintenance of a SEZ (both for the developer as well as for the zone enterprise) and exemption from all taxes on income for a period of ten years. The provincial SEZ authorities, set up under the law, are required to move the applications received from developers to the Federal Board of Investment which is to act as the secretariat to the Board of Approval and the Approval committee.

Indeed, it is a legal requirement in Pakistan to obey the environmental laws during carrying out any developmental activities and get it approved from the concerned regulating agencies before embarking on the development activities. Provincial environmental legislation also requires similar environmental approvals from relevant provincial authorities (provincial environment departments). In addition, the aim of the

EIA study is to ensure sustainable development in Pakistan. This EIA report provides an assessment of anticipated positive and negative environmental impacts of the proposed Project, along with the appropriate measures to further enhance the beneficial impacts and to mitigate any adverse impacts.

SALIENT FEATURES OF PROJECT

1.	Project title	Indus-Valley Industrial Junction Special Economic Zone
2.	Location	Village Suri, Sub Tehsil Shahwali, Tehsil Rojhan, District Rajanpur, Punjab
3.	District	District Rajanpur
4.	Name of Proponent	**Mr. Irfan Hameed Khan** S/o Abdul Hameed Khan (Proponent)
5.	Address	State Life Cooperative Housing Society, DHA, H # 96-E, Lahore, Pakistan. Contact #: +92-303-0663070
6.	Area of the project	Total area of project is 124 Acres (5401440 sq ft).
7.	Type and category of project	falls in Sub-Section 5 (Industrial estates (including export processing zones / ports) of Section B (Manufacturing and processing) Schedule II for EIA projects due to the cost, size and nature and overall severity and frequency of impacts
8.	Nature of the Project	A special economic zone is an area in which the business and trade laws are different from the rest of the country. SEZs are located within a country's national borders, and their aims include increasing trade balance, employment, increased investment, job creation and effective administration.

10.	Availability of resources	All fundamental resources are available at the project site.
11.	Source of electricity	WAPDA
12.	Manpower requirement	250-300 during construction phase More than 300 during operational phase
13.	Water requirement	Water is required for industrial, commercial and domestic purpose. During Construction Phase 1100 gal/day During operational phase 4000 gal/day.
14.	Solid waste and its management	During construction most of the construction material will be utilized while during operational phase, site has been selected in SEZ where solid waste will be dump from where sanitary workers or company of that area will be collected and dump according to their guidelines.
15.	Wastewater and its treatment in proposed project	Wastewater will be reuse during construction activities as making material etc. while during operational phase wastewater will be treated according to block's activities
16.	Cost of project	Total cost of the project is approximately 4000 million.

Environmental Consultants:

An Environmental Impact Assessment (EIA) study report has been prepared to identify and predict the significant environmental impacts likely to arise from the commencement of the project along with environmental impact statement followed by delineation of appropriate Environmental Management Plan and Environmental Monitoring Plan to check the implementation of the EMMP. Proponent of project has decide to conduct Environmental Impact assessment Study by environmental consultants, Ecosphiron

Environmental Services, Office # 5, F-2, 9 Kashmir Block, Jalal Center, Allama Iqbal Town, Lahore.

Contact Numbers: 0301 4276787, 0322-4908520
Email Address: ecosphiron@gmail.com

Names	Designation	Roles and responsibilities
Ms. Shakeela Rani	Manager (Environmental legal)	Technical Support.
Mr. Manzoor Ahmad	Manager (Operations)	Baseline study/ Report preparation
Mr. Ahmed	Assistant Manager (Operation)	Logistic and report preparation
Mr. Ammar Hashmi	Finance Manager	Project Administrator
Miss Amna Bukhari	Sociologist	Technical Survey Conducting
Mr. Ali Raza	Field Coordinator	Assist for Baseline Study

A Brief Outline of Project:

A special economic zone (SEZ) is an area in which the business and trade laws are different from the rest of the country. SEZs are located within a country's national borders, and their aims include increasing trade balance, employment, increased investment, job creation and effective administration. To encourage businesses to set up in the zone, financial policies are introduced. These policies typically encompass investing, taxation, trading, quotas, customs and labour regulations. Additionally, companies may be offered tax holidays, where upon establishing themselves in a zone, they are granted a period of lower taxation.

The creation of special economic zones by the host country may be motivated by the desire to attract foreign direct investment (FDI).The benefits a company gains by being in a special economic zone may mean that it can produce and trade goods at a lower price, aimed at being globally competitive. In some countries, the zones have been criticized for being little more than labor camps, with workers denied fundamental labor rights.

M/s Indus-Valley Industrial Junction (Private) Limited has intended to construct an Indus-Valley Industrial Junction Special Economic Zone at Village Suri, Sub Tehsil Shahwali, Tehsil Rojhan, District Rajanpur, Punjab. Mix use project in which comprise of infrastructure works including pavement, structures like retaining walls, Culverts,

underground water tanks, Septic Tanks, Treatment Plants, residential villas, multi-story buildings, Hotels, educational Institutes and hospitals etc. The wastewater treatment and solid waste management practices are well planned along with mentioned objectives. Thus total cost of the project is approximately 4000 million. Total area of project is 124 Acres (5401440 sq ft).

The Major Impacts & Recommended Mitigation Measures

Evaluation of the site inspection and findings are the key sources to make a list of the positive and negative impacts on the environment of the surrounding of project site. Evaluating the key points is to reduce all negative impacts that are harmful to the surrounding environment in any form**.** The Positive impacts of the project utilization on economy and poverty can eradication and sustained economic growth of our country. 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.

	POTENTIAL IMPACTS	**MITIGATION MEASURES**
	Procurement & Setting up of Crushers, Hot-mix plants, other Vehicles, Equipment and Machinery	
	Operating of all equipment and machinery during construction and operation can be harmful if not treated properly	During construction phase Specifications of crushers, hot mix plants and batching plants, other Construction Vehicles, Equipment and Machinery to be procured should comply to the relevant Standards/ norms and with the requirements of the relevant current emission control legislations. Hot mix plants, crushers and batching plants shall be located at adequate distance. Pollution control measures for Diesel Generator (DG) set i.e. stack height, acoustic enclosure etc.

		During operational phase, adequate stack height and emission control devices such as bag house filters, cyclone separators, water scrubbers etc., should be attached. Proper lighting arrangement shall be made around plant site if the plants are operated during dark hours. Provision of readily available first aid kit, fire fighting equipments at the plant site at appropriate location to respond in case of accident during construction and operational phase.
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 like sanitary workers of that area will collect the 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 produce waste which varies and there is a specific point in the SEZ where all sort of solid waste will be dump later on sanitary team of that area will collect this on regular basis.
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 varies like in SEZ there will be domestic, industrial, commercial and hospital waste. Every block will have its own wastewater treatment facility.
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 burden on 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	During construction phase all emergency conditions will be prepared like fencing

	local residents.	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 will be followed in every block.
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 open area which is going to SEZ. 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/waste 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 SEZ there 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 open area where there is no biodiversity. Adopting a vegetation program that uses indigenous stocks of local vegetation Proponent is committed to plant the plants after completion of construction work for making the environment friendly and for aesthetic beauty as well.
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 of every block.
13	**Socioeconomic**	
	Socioeconomic factor comes in priority	By reducing socioeconomic problem

	parameters because it's about surrounding people income.	following measures should be adopted; The site is open area but still the proponent is committed to give job opportunity to the locals of the area. ➢ Reducing potential exposure to emissions.
14	**Air Emissions**	
	By operating the industrial equipment, few gases can be emitted like particulate matters etc.	Air emissions during construction phase will be usually from generator but generator would be maintained and up-to-date to control the air emissions. Electrostatic precipitators and other air pollution control devices will be used in industrial block while in commercial and residential proper tree plantation plan and aesthetic exercises will be done. So by keeping the all protocols, air emissions will be controlled in operational phase of the project.
15	**Vibration and Noise Pollution**	
	Vibration and noise pollution can be produced during construction phase and operational phase if machinery will not be properly look after. The vibration and noise pollution can cause the trouble to surroundings.	The vibration and noise pollution during construction and operational phase will be controlled by grouting the machinery fully and generators will be kept in canopy and will be fully maintained.

Project will have all SOPs when will start. 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). Site specific and practically suitable mitigation measures are recommended to mitigate the impacts.

Proposed Monitoring:

For proposed monitoring, proper monitoring strategy will be adopted**.** The purpose of a monitoring strategy is to define the scope and focus of a grantee's monitoring efforts, including establishing a framework for determining the appropriate level of monitoring for sub recipients based on the resources available. A grantee's work plan should include time to conduct a risk analysis on each sub recipient as well as where and when the grantee will apply staff and travel resources for monitoring, training, or technical assistance of its sub recipients.

The environmental monitoring schedule at the project site will be decided as per condition will mention in the NOC. However the monitoring schedule for project activities will be evaluated on daily bases before labor will start work.

Monitoring at the proposed sites has been conducted for ambient air, Noise level and ground water and the reports demonstrated that results are within the limits prescribed by PAK-PEQS (2016). The values of these parameters are present in baseline study of project.

Conclusion

The Environmental Impact Assessment 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 impacts. It also identifies adverse environmental factors associated with the project. Appropriate mitigation measures, as explained in the environmental study, should be reduced, 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 main 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 knowledge and belief.

_____

Mr. Irfan Hameed Khan S/o Abdul Hameed Khan

(Proponent)
Indus-Valley Industrial Junction Special Economic Zone, Rajanpur

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List of Abbreviation

atm	Atmosphere
CO_2	Carbon dioxide
°C	Degree Celsius
EHS	Environment Health and Safety
EIA	Environmental Impact Assessment
EMMP	Environment Management & Monitoring Plan
EMP	Environmental Management Plan
EPA	Environmental Protection Agency
EPD	Environment Protection Department
EZ	Economic Zone
IVI	Indus Valley Industrial
IEE	Initial Environmental Examination
S.T.P	Sewage Treatment Plant
IT	Information Technology
DG	Diesel Generator
PEQS	Punjab Environmental Quality Standards
NOC	No Objection Certificate
PEPA, 1997	Pakistan Environmental Protection Act, 1997
PEPA, 2012	Punjab Environmental Protection (Amendment) Act, 2012
PEPO	Pakistan Environmental Protection Ordinance
PPEs	Personal Protective Equipment
SEZ	Special Economic Zone

CHAPTER I
INTRODUCTION

1.0 Purpose

M/s Indus-Valley Industrial Junction (Private) Limited has intended to construct an Indus-Valley Industrial Junction Special Economic Zone at Village Suri, Sub Tehsil Shahwali, Tehsil Rojhan, District Rajanpur, Punjab. Mix use project in which comprise of infrastructure works including pavement, structures like retaining walls, Culverts, underground water tanks, Septic Tanks, Treatment Plants, residential villas, multi-story buildings, Hotels, educational Institutes and hospitals etc. The wastewater treatment and solid waste management practices are well planned along with mentioned objectives. The study has been carried out to estimate the potential environmental and social impacts, positive and negative, on the environment as well as socio-economic of the surrounding environment during construction as well as operational phase. 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 1997 (Amended 2012) and its consequent legislative framework for IEE/EIA including the IEE/EIA Regulations 2000 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.

1.1 Identification of the Proponent

Contact Person

Mr. Irfan Hameed Khan S/o Abdul Hameed Khan (Proponent

Address of the Proponent:
State Life Cooperative Housing Society, DHA, H # 96-E, Lahore, Pakistan.

Identification of the Project:

Indus-Valley Industrial Junction Special Economic Zone at Village Suri, Sub Tehsil Shahwali, Tehsil Rojhan, District Rajanpur, Punjab

1.2 Environmental Consultants:

The Environmental Impact Assessment (EIA) has been carried out by aptly skilled and duly qualified group of professionals working for the environmental consulting Services namely Ecosphiron Environmental Services, Lahore. The consulting team can be approached through the following contact details:

Ecosphiron Environmental Services

Office # 5, F-2, 9 Kashmir Block, Jalal Center, Allama Iqbal Town, Lahore

Contact No. 0301 4276787, 0322-4908520

ecosphiron@gmail.com, manzoorahmad41@yahoo.com

Names	Designation	Roles and responsibilities
Ms. Shakeela Rani	Manager (Environmental legal)	Technical Support.
Mr. Manzoor Ahmad	Manager (Operations)	Baseline study/ Report preparation
Mr. Ahmed	Assistant Manager (Operation)	Logistic and report preparation
Mr. Ammar Hashmi	Finance Manager	Project Administrator
Miss Amna Bukhari	Sociologist	Technical Survey Conducting
Mr. Ali Raza	Field Coordinator	Assist for Baseline Study

1.3 Nature and Size of Project

The project is Indus-Valley Industrial Junction Special Economic Zone at Village Suri, Sub Tehsil Shahwali, Tehsil Rojhan, District Rajanpur, Punjab. The project has been planned on the norms of sustainable designs and patterns provided under the legislative and sectorial guidelines of Environmental Protection Agency, Punjab. The total area of the project is 124 Acres (5401440 sq ft).

A total of 250-300 people will work on the project during construction phase and almost more than 300 in operational phase. This is further explained under Environmental Impacts and Mitigation Measures for the project.

The whole project will require about 1100 gal/day of water at project site during construction phase while 4000 gal/day in operational phase.

No hazardous waste will be generated at the site. Only small quantity of waste is generated which is dump according the rules in specified area from where sanitary workers of that area will collect and dump according to their guidelines.

Along with the secondary facilities, the proponent of the project has planned provision of the basic facilities/utilities for the project. Provision of infrastructure for provision of telecommunication services will be developed to meet the future demand.

1.4 Eco-Friendly Features of the Project

Special feature of the project is its eco-friendly work. The basic idea of the concept is to create safe, modern as well as environmental friendly SOPs to ensure improved working conditions required by the potential users.

Vision

To measurably accelerate Pakistan's economic diversification, global integration, and improvement in human welfare

Mission

To successfully undertake activities with a high marginal impact on the attraction and sustainability of private, productive investments, in a set of sectors which collectively promise Pakistan massive employment, much greater industrialization, greater export potential, diversification into knowledge-based sectors, and a new level of global economic connectivity through effective policy advocacy, investment facilitation and promotion.

Special Economic Zones (SEZs) Act, 2012 (Amended In 2016)

- Minimum land requirement is 50 acres (20.23 hectors or 202,343 Sq m) with no maximum limit
- Board of Investment is the Secretariat for SEZ

1.5 Location

The project is Village Suri, Sub Tehsil Shahwali, Tehsil Rojhan, District Rajanpur, Punjab.

The project site is surrounded by:

East: Railway Track (Dry Port)

West: Open Area

North: Open Road

South: Tri-Border

1.6 Extent/scope of EIA Study

EIA is conducted under the legal framework of Punjab Environmental Protection Agency (PEPA). As per legal requirements, the Project will be reviewed in light of the provisions of Punjab Environmental Protection Act, (PEPA-2012) and IEE/ EIA Regulations 2000, 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. 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 1.1

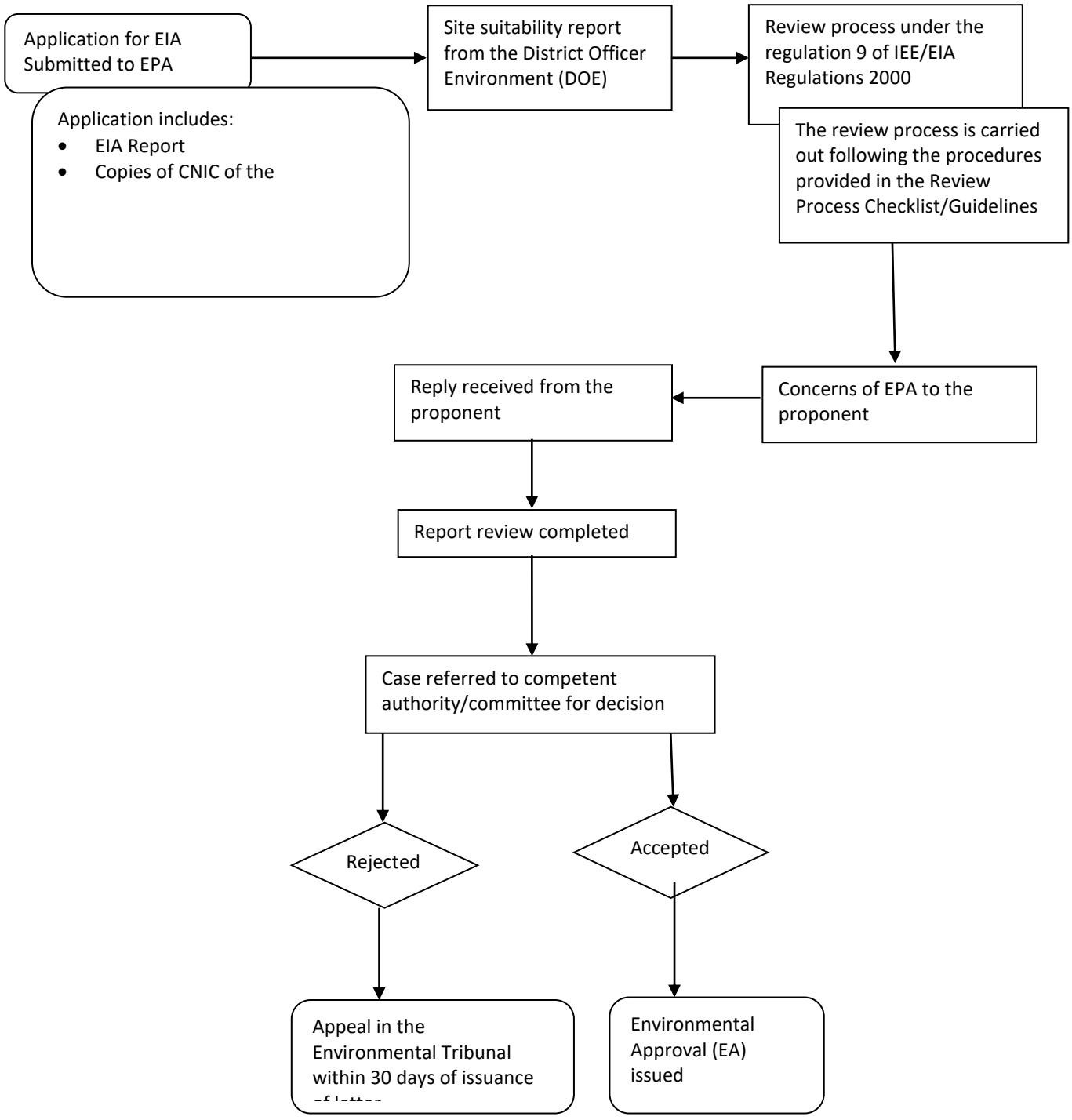


Fig 1.1: The EIA process flow chart

The format of this EIA covers the followings:

1.7 Structure of the Report

EIA report comprises following chapters:

Chapter 1: Introduction (A description of the project, proponent and consultants, the need for the project and the report and method of preparing it).

Chapter 2: Project Description (Full description of the relevant parts of the project and summary of project inputs and outputs).

Chapter 3: Policy, statutory, and institutional Framework (A description of the pertinent national & provincial legislations, 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 (Description of project area's existing physical, biological and socio-economic condition, including geomorphology and soils, water resources, air quality, flora, fauna and demography).

Chapter 5: Stakeholder Consultation (This chapter comprises on the public and stakeholder consultation with whom project related and about their life style different questions were asked).

Chapter 6: Project Impacts and mitigations (Presents an assessment of the project's impacts, suggested mitigation measures on the Physical, Biological and Socioeconomic environment, residual impacts and the monitoring requirements).

Chapter 7: Environmental Management Plan (Provides Environmental Management Plan& Environmental Monitoring Plan for the construction &operational phase of the project).

Chapter 8: Conclusions & Recommendations (Concludes the EIA report with a few recommendations to conduct the project in environment-friendly manner).

CHAPTER II
DESCRIPTION OF THE PROJECT

2.0 Type and Category of the Project

According to projects categorization for environmental assessment studies, the proposed project that is "Proposed project is Indus-Valley Industrial Junction Special Economic Zone at Village Suri, Sub Tehsil Shahwali, Tehsil Rojhan, District Rajanpur, Punjab" falls in Sub-Section 5 {Industrial estates (including export processing zones / ports) of Section B (Manufacturing and processing) of Schedule II for EIA projects due to the cost, size and nature and overall severity and frequency of impacts. This report is required to fulfill the legal requirements set under section 12 of the Punjab Environmental Protection Act, 1997 (Amended 2012). 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 Objectives of the Project

The main objectives of the project is generation of additional economic activity, promotion of exports of goods and services, promotion of investment from domestic and foreign sources, creation of employment opportunities along with the development of infrastructure facilities. Economic zone promote general investment and business environment and with especially favorable conditions for investors, and which has defined geographical boundaries and which is established in accordance with regulations of the Government

2.2 Alternatives Considered

Now a days development is going to be increased day by day rapidly and in the city industries are sometime work randomly while having industrial zones. The scattered business apart from industrial zone can make restrictions. The project availability of land

at the best convenient place and at reasonable price was yet the other considerations for the site selection. Availability of access roads, communication facilities, electricity, gas, basic infrastructure, sewer etc. was yet the other necessary requirements. Of course neat and clean environment was also the other consideration.

Keeping these requirements and their availability, the present site is the best suited for the construction of the project. The area is far away from the residential activity. All the other basic infrastructural requirements are available at the selected site. Accordingly, the selected site is ideally suited for construction of the project. Keeping these considerations in mind three alternatives considered which were:
Alternative I – No Project: First option is always that there would be no project because project always make pollution and certain issues in regard of environment. And second thing is project would be reason for noise pollution and if population is near the project then it may cause the trouble for nearest population.

Alternative II "Scope of Indus-Valley Industrial Junction Special Economic Zone, Rajanpur: The proposed project is a special economic zone in which the business and trade laws are different from the rest of the country. SEZ is located within a country's national borders, and their aims include increasing trade balance, employment, increased investment, job creation and effective administration. To encourage businesses to set up in the zone, financial policies are introduced. These policies typically encompass investing, taxation, trading, quotas, customs and labor regulations. By considering scope of project, site selected for project at different points.

Alternative IV-Final Selection of Proposed Project that is SEZ: Said project is SEZ which is determined individually by each country. According to the World Bank in 2008, the modern-day special economic zone typically includes a "geographically limited area, usually physically secured (fenced-in); single management or administration; eligibility for benefits based upon physical location within the zone; separate customs area (duty-free benefits) and streamlined procedures." Various sites have been identified for development of special economic zone. Pre-feasibility study for various sites has been carried out to analyze suitability of site for SEZ development by M/s Indus-Valley Industrial Junction (Private) Limited. Indus-Valley Industrial Junction Special Economic

Zone at Village Suri, Sub Tehsil Shahwali, Tehsil Rojhan, District Rajanpur, Punjab is one of the most potential & suitable zone for development of SEZ. Moreover detailed Geotechnical Investigation done which results showed site is ideal in all aspects.

1. The site is analyzed on basis of location, accessibility, potential for industrial growth, availability of raw material, infrastructural development, availability of man-power.
2. No Resettlement & Rehabilitation Issues
3. Located outside city Corporation, Municipality and rest of Pakistan's cities
4. Railway station close by
5. Project site does not lies within any eco-sensitive zone or ecological critical area
6. Availability of large nos. of un-skilled and semi-skilled labor

A. Consideration of Alternatives

1. Design/Technology alternatives, their selection and rejection criteria

In the proposed project, the technology will be latest and having good efficiency, less energy consumption. Thus that technology will also be considered in the new project (SEZ). The rejection criterion is no matter if proponent is well aware already with technology.

2. Environmental alternatives, their selection and rejection criteria

The environmental alternatives were considered as project site is already located in open area and having no impact on the environment. The criteria for selection the environment is less harm on air, water and ecosystem which are secured around the project site in all aspects. Thus environmental alternatives are not more set the regime for project site. As monitoring results also showed all parameters are within the limit and after constructing and during operational phase, all parameters will remain within the limit.

3. Economic alternatives, their selection and rejection criteria

Economic is the actual criteria to show the difference between the incentive and investment. The project is located on open area and Shahwali dry port is adjacent which make the project feasible and economic. The technology considered is already

best technology having 99% efficiency with low consumption of energy, the project have no issues in regard of environment and ecosystem. The fundamental necessities already exist in the site. Thus economic alternatives are not need to consider here as project site is ideal and having no compensation in any regard even. Thus investment is slightly while incentive will be considered good at the project site.

Suitability of site

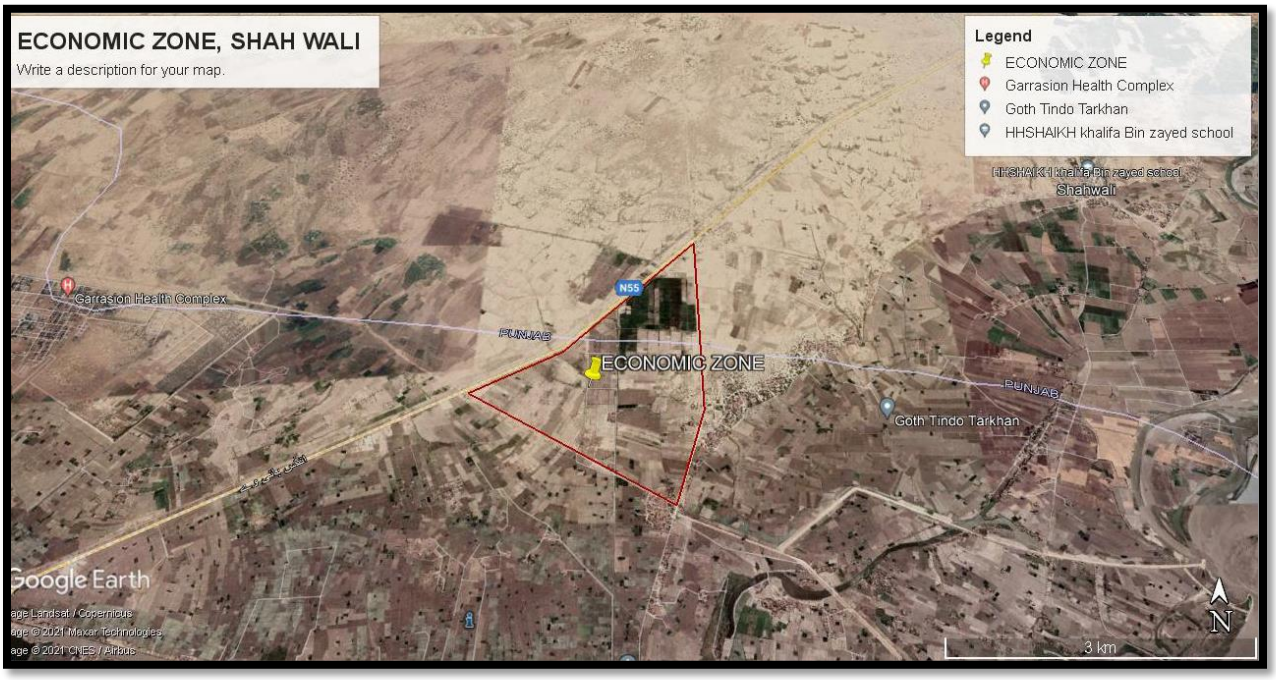
Suitability of site depend on the considering all fundamental parameters, analyzing the soil, monitoring from all aspects (environment, water and noise). All kind of monitoring has been done on the site and environmental reports have been submitted. Moreover, dry port makes the project very ideal in regard of export and import. Thus suitability of site is ideal in all aspects.

These have been considered while selecting the choicest alternative. As for the design, different criteria were considered for finalization of a safe design. For this, a site where fundamental necessities are available will be feasible for project as well as will be good decision for project.

2.3 Location Plan/Map

Title of proposed project is “Indus-Valley Industrial Junction Special Economic Zone” which will start landscaping construction after getting environmental approval from EPA, Punjab. The project site is located near Kashmore City, Village Suri, Sub Tehsil Shah Wali Tehsil Rojhan, District Rajanpure. The proposed site is located at global coordinates of Lat 28.47672o and Long 69.66934o and elevation of 270 ft (82 Meter) above mean sea level. Google Satellite Imaginary for Layout of project site is mentioned below;

Figure. 2A: Google Earth View of Project Site



2.4 Land use on the site:

Proposed project site is about "Indus-Valley Industrial Junction Special Economic Zone at Village Suri, Sub Tehsil Shahwali, Tehsil Rojhan, District Rajanpur, Punjab" which is intended to start their project after getting environmental approval from EPA, Punjab. Layout plan of land is attached with this report as an Annexure. The total area of the project is 124 Acres (5401440 sq ft) and project is an open plot.

Table 2.1: Land Use Distribution

Land Use Distribution			
Sr. #	**LAND USE**	**Area (Acres)**	**% age**
1	AREA UNDER INDUSTRIAL PLOTS	86.80	70.00
2	COMMERCIAL	2.66	2.14
3	SECURITY & ADMIN OFFICE	0.35	0.28
4	FIRE STATION	0.12	0.10
5	ROADS	27.02	21.79
6	S.T.P	1.04	0.83
7	OPEN SPACES	0.39	0.32
8	AREA UNDER APARTMENTS	4.67	3.77
9	MASJID	0.36	0.29

10	SCHOOL	0.32	0.26
11	HOSPITAL	0.27	0.22
12	TOTAL AREA - PILOT PROJECT	124.00	100.00
	TOTAL AREA	**124.00**	-

Table 2.2: Detail of Industrial Plot

DETAILS OF INDUSTRIAL PLOT	
BLOCK NAME	**No. of Plots**
BLOCK A	63
BLOCK B	69
BLOCK C	27
Total	159

Table 2.3: Plots Distribution

Plots Distribution		
Type of Industry	**Plots Provided**	**No. of Plots**
AUTO MOBILES & TRACTOR PARTS	14	A3 TO A16
TEXTILE	37	A17 TO A53
SPORTS & ALLIED FACILITIES	12	A54 TO A65
AGRI BASED & FOOD PROCESSING	34	B1 TO B34
CONSTRUCTION / PRE FAB TECHNOLOGIES	35	B35 TO B69
IT & TELECOMMUNICATION	27	C1 TO C27
Total	159	

2.5 Road Access:

The proposed project site is near the main road. The said project surrounded by open it directly connects to Kashmor and Rahim Yar Khan, it also linked to rest of cities of Pakistan and Tri-Border. Railway dry port is in front of this project site.

2.6 Vegetation features of the site:

At present, the Project Area is consisted of no bushes and grass or even small plant. The proposed project area has open plots on its right, left and back sides of the project site, while road is in front of the project site.

2.7 Magnitude of the Operation Including Capital Cost and Associated Activities

The proposed project intends on constructing Indus-Valley Industrial Junction Special Economic Zone at Village Suri, Sub Tehsil Shahwali, Tehsil Rojhan, District Rajanpur, Punjab and the total area of the project is about 124 Acres (5401440 sq ft). The total estimated cost of the proposed off-site facilities is approximately 4000 million that includes the construction cost basics of SEZ, site survey, geotechnical investigations, infrastructure work, structural work, electrical and mechanical works, administration building, access road and land development. Details of cost of each component are given in table below;

Table 2.4: Capital Cost of the Project and Associated Activities

Sr. #	Description of Work	Amount on PKR (Millions)
1	site survey & geotechnical investigations	100
2	Site development	1100
3	Access Road	800
4	Administration Buildings	700
5	Boundary Wall	600
6	Electrical & Mechanical work	700
7	Total	4000 millions

Activities of construction include the followings:

- Site clearing
- Demarcation of the Area for various facilities
- Infrastructure works (roads, water supply, sewerage and drainage, gas, electrical works etc.)
- Installation of street lights

- Plantation of plants and grass

2.8 Water Requirement

The surplus water during the construction phase of the whole project will be estimated to meet any unforeseen situation. The water demand will be fulfilled from ground water. Water demand for various uses has been estimated on the basis of WASA specifications. Water requirement for maintenance of green belts will be done on daily basis by ground water through pumps and pipes to avoid wastage of water. The water requirement for the construction phase will be 1100 gal/day while during operational phase water requirement will be 4000 gal/day. The water will be in operation phase for sake for cleaning and domestic purpose.

Table 2.5: Water Utilization in different Blocks

Water Utilization in different blocks				
Sr. #	Description	**Area (Acres)**	**% age**	Total Water Demand Gal/day
1	AREA UNDER INDUSTRIAL PLOTS	86.80	70.00	2200
2	COMMERCIAL	2.66	2.14	900
3	SECURITY & ADMIN OFFICE	0.35	0.28	75
4	FIRE STATION	0.12	0.10	150
5	ROADS	27.02	21.79	-
6	S.T.P (Sewage Treatment Plant)	1.04	0.83	100
7	OPEN SPACES	0.39	0.32	50
8	AREA UNDER APARTMENTS	4.67	3.77	100
9	MASJID	0.36	0.29	50
10	SCHOOL	0.32	0.26	75
11	HOSPITAL	0.27	0.22	300
12	TOTAL AREA - PILOT PROJECT	124.00	100.00	
	TOTAL AREA	**124.00**	-	

2.9 Wastewater Generation and Disposal

Cut-off drain will be provided all along the periphery of the site and will be connected to nearest existing discharge point. Peak-runoff should be considered for designing the

drainage system. The management of the project will lay down sewer pipe line up to the main sewerage and will also construct septic tanks for primary treatment to affect the wastewater quality before its discharge in the main sewer.

Sewage & Effluent Treatment

All industries should be responsible for treatment of the sewage and effluent generated from their unit so that all industries are zero discharge.

2.10 Solid Waste Generation and Disposal

Estimated quantity of solid waste during construction phase is varied. The reason being, solid waste will have excavation material as major part of its overall composition. However, the earth material will be reused within the site eventually leaving zero waste due to excavation activities. Therefore, solid waste during construction phase will include the solid waste generated due to workers activities. Waste to be generated during construction phase will be left out construction material like metal piece, wood piece, unused concrete, broken bricks, etc. Quantity of the solid waste to be generated during construction phase may vary from 30-50 kg/day. Rejected waste should be disposed off at the designated sites by local authority. Nature of solid waste generated during the operation phase will be highly variable due to presence of different kind of industries in the SEZ. Majorly as per the feasibility study light engineering industries, food processing industries and textile industries may come up in the SEZ. These industries are less polluting industries. Solid waste generated by industries should be managed by industries. A site has been designated in layout for storage and disposal of solid waste within SEZ site. The waste will be collected by waste collecting company from SEZ on daily basis and dump according to their guidelines.

2.11 Energy Demand

The energy will be supplied by WAPDA and generators will be installed as back up energy resource. The generators will be kept in canopy to keep the noise pollution lower.

2.12 Manpower Required

The man power during construction phase will be 300-350 persons, while more than 300 persons will perform their duties during operational phase in SEZ in different blocks and administration. Thus the project is source of employment for economic development activities of the area.

2.13 Proposed Schedule of Implementation

It is estimated that the entire project will take twelve to eighteen months for completion of construction phase, if the activities go as per the plan.

Activities involved are:

- Land acquisition – already done (Land ownership documents are along with this report)
- Lay out plan of project (attached herewith this EIA report)
- Leveling of land
- Excavation for foundation building
- Work on pavements, roads, sewer system, electricity and telecommunication grid installation etc
- Construction of site
- All finishing work of the entire construction work will be furnished after last step.

Table 2.6: Implementation Schedule of Off-site Infrastructural Details

Sr. #	Offsite infrastructure	Duration in months from start
1	Site Development	12
2	Access road	6
3	Admin building	12
4	Boundary Wall	8

2.14 Details of Restoration and Rehabilitation Plan:

2.14.1 Purpose and Scope:

The purpose of restoration and rehabilitation plan development is to structure individualized services that will enable the individual to obtain and maintain suitable employment, and/or to maximize independence in daily living. The structure of the plan

allows the counselor and the individual to translate the findings of the initial evaluation into specific rehabilitation goals and objectives. When starting a comprehensive rehabilitation project in informal settlements, the first thing to take into consideration is a comprehensive understanding of the parameters that characterize the project system.

2.14.2 Required Elements of Rehabilitation Plans:

- Program goal
- Objectives designed to meet the goal
- Anticipated completion dates
- Services to be provided
- Duration of services
- Service providers
- Evaluation criteria
- Evaluation schedule of at least once every 12 months

2.14.3 Advantages of the Project:

- Anchor for attracting FDI Growth Contribution.
- Industrial Development.
- Employment generation.
- Technology Transfer and Productivity enhancement.
- Increase in Exports.
- Skill Development & Capacity Building.
- Development of Pakistani Brands.
- Development of Vendor Industry & Supply Chain.

  Thus during making the feasibility of the project, there was no any element which would be planned during project for rehabilitation. Overall project site is an open site and in surrounding no biodiversity or infrastructure will be disturbed which would be rehabilitate or restore. However, management of SEZ is committed to plant trees to make the environment healthy and aesthetic.

2.15 Government Approvals

Acquisition of approvals for the said project need from TMA and EPA. Thus proponent has applied for these approvals and project is environment friendly at all aspects.

2.16 Safety Measures at Project Site

Through inspection processes, ensure project facilities are capable for healthy life. Develop and distribute clear-cut guidelines dealing with project's policy on safety. Every individual involved in the project should know what is expected and how to perform the assigned tasks. Get together of society members will be done for more improvement will be done. Further, if an unsafe work practice is noticed, corrective action should be taken immediately.

2.17Current Vegetation Features on Site:

At present, there are no plant even grass which will be cut off due to project construction. The proposed project area has open plots on its right and back sides of the project site, while Road is in front of the project site.

2.18 Resources and Utilities Demand:

Construction Materials Sourcing

Construction material like steel, cement, concrete, bricks, aggregates etc. will be required for each of the proposed off-site facilities and EZ development. Since the planning has been carried out for offsite development, the detail provided below pertains to off-site facilities. The EZ development requirement though will remain similar in nature but these details for EZ shall be available after the master developer is appointed.

Street Lighting

Street lighting will be provided on the proposed access road. Solar street lights should be proposed in ratio of 1:2. Average illumination of 20 lux should be maintained on the access road.

Telecommunications

Indus Valley Industrial Junction Economic Zone has mobile connectivity from almost all mobile companies. Moreover PTCL is also available.

Sewage & Effluent Treatment

All industries should be responsible for treatment of the sewage and effluent generated from their unit so that all industries are zero discharge. Sewage should be treated in the treatment plant then will be drain out.

Green Belt Development

Green buffer of 10 m width will be developed all around the EZ site. Multi-layered plantation will be carried out in the buffer. Peripheral green belt will be developed by the developer. In addition to this all industries will develop green belt all around their respective plots. Native plant species consuming less water and requiring less after care and monitoring should be considered. Such species include Neem, Roses, Palms, Gauwa, Mango, Amaltas etc. Green buffer should consist of minimum 3 rows of vegetation. First row of green buffer should be small shrubs and herbs, second row of tall shrubs and small/medium height trees and last row of medium to tall heighted trees.

Transportation Options for the EZ

The transportation options are available the project site. By road and by train (dry Plan of Dry Port (Shahwali Railway Station) District Rajan Pur. The drawing of connectivity of project site and dry port is attached as an Annexure.

Estimated Traffic from SEZ

Table 2.7: Estimated Traffic from Indus Valley Industrial Junction Economic Zone in 60 Minutes

Vehicle Type (%)						
Type of Development		**Car, Taxi**	**Motorcycle, Cycle**	**Van/Mazda**	**Heavy Vehicle**	**Bus**
1	AREA UNDER INDUSTRIAL PLOTS	54	12	23	44	11
2	COMMERCIAL	56	34	51	21	22
3	SECURITY & ADMIN OFFICE	12	14	2	2	16
4	FIRE STATION	38	23	2	0	2
5	ROADS	73	44	33	36	16
6	S.T.P	0	0	4	3	0
7	OPEN SPACES	19	31	2	0	0
8	AREA UNDER APARTMENTS	43	41	1	0	0
9	MASJID	13	11	0	0	0
10	SCHOOL	26	8	13	0	4
11	HOSPITAL	23	10	0	0	0

Expected Daily Traffic= (Average Rate) x (Area of Development)

Scoping

Scoping of the cumulative effects assessment involves identification of other projects, activities or disturbance features in the vicinity of the project, including past, present and future projects, which may have effects that could combine with the residual project effects to increase the level of effect on surrounding environment. Past and present projects are identified from

- historical records of activities;
- spatial information identifying existing disturbance features (clearing, ground disturbance,
- locations of facilities, roads and other linear disturbance features, etc.); traditional knowledge;
- current land tenures; and

- knowledge of ongoing activities (access development, and exploration activities)

Scoping is the process of determining the content and extent of the matters which should be covered in the environmental information to be submitted to a competent authority for projects which are subject to EIA.

The all contents and extent with matter of project has been explained either in construction phase or operational phase. The contents are also discussed in Chapter II in different aspects. The all information in regard of project has been taken according to the existing data and further information of new project.

1. **Spatial and Temporal Boundaries of Environmental Assessment**

   Temporal and spatial boundaries for the effects assessment are defined by the characteristics of the project. These boundaries encompass time periods and areas during and within which the valued ecosystem are likely to interact with or be influenced by the project. Spatial boundaries vary according to the nature of the ecosystem but generally are defined in terms of "a local study area where project effects can be predicted with a reasonable degree". The proposed project (SEZ) is existed in the open area where in surrounding land is also open. Thus spatial and temporal boundaries for proposed project is just a limit because proposed project is secured from outside effects as it is existed in open area. The spatial terms might also be considered in regard of habitat, wildlife, areas where air can be changed by project activities and activities like transportation etc.

2. Temporal boundaries for the project will be considered if with passage of time project will later the surrounding air, water and noise issue which are negligible because proposed project is existed on the open area. The project is located where in surrounding mostly open area is present.

CHAPTER III
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 Environmental Impact Assessment (EIA) 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).

3.3Institutional 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 National Environmental Quality Standards (NEQS) were established for effluents discharges and gaseous emissions of various Municipal and Industrial sources. The latest revision of NEQS 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 NEQS 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 Environmental Impact Assessment (EIA), 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, mitigatory, 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 2000

The Pak EPA has issued Review of the Initial Environmental Examination and Environmental Impact Assessment Regulations 2000, 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.

CHAPTER 4: DESCRIPTION OF THE ENVIRONMENT

4.1 General

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

Prior to identifying the existing environmental settings of a proposed project site, it is essential to define the impact zone for the proposed project zone. Impact zones are essentially defined to substantiate the impact significance in terms of its severity and frequency on the environmental settings of the described area. The impact zone of this particular project is a radius that comes under the direct impacts in case of any accidents. In addition, depending upon the availability of the information, a generalized overview of the environmental settings is also presented where necessary. The existing environment in and around the Project Site has been studied with respect to physical, ecological and socio-economic conditions.

Information regarding physical environment is collected within project area as well as the study area. While in case of biological and social environment, efforts were made to collect the information in one km around the project area for detailed Land cover classes and even up to 10 km buffer data in-case of any direct or indirect impacts were envisaged. **Rajanpur District**, is a district of Punjab province in Pakistan. According to the 1998 census of Pakistan it had a population of 1,103,618 of which 14.27% were urban.Its administrative centre is Rajanpur.

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

Administrative Divisions

The district of Rajanpur is divided into three tehsils, which contain a total of 44 Union Councils.

Tehsil	No. of Union Councils
Jampur	19
Rajanpur	16
Rojhan	9

RAJANPUR DISTRICT AT A GLANCE

Area	12318Sq.Kms.
Population – 1998	1103618 persons
Male	580822 (52.63%)
Female	522796 (47.37 %)
Sex Ratio (males per 100 females)	111.1
Populaltion Density	89.6 per Sq. Km
Urban Population	160155 (14.51 %)
Rural Population	943463 (85.49 %)
Average Household Size	7.3
Literacy Ratio (10 +)	20.7%
Male	29.0 %
Female	11.3 %
Population – 1981	638921 persons
Average Annual Growth Rate (1981 - 98)	3.27 %
Total Housing Units	151733
Pacca Housing Units	25598 (16.87%)
Housing Units having Electricity	61372 (40.44 %)
Housing Units having Piped Water	12895(8.49 %)
Housing Units using Gas for Cooking	953 (0.63 %)
Administrative Units	
Tehsils	03
Union Councils	47
Mauzas	532
Municipal Committees	02

Town Committees	04

4.2 Methodology of Conducting Baseline Study

Establishing the environmental baseline includes both the present and likely further state of the environment, taking into account changes resulting from natural events and from other human activities.

The guiding factors for the present baseline study are the EPA's requirements for the Initial Environmental Examination notification and local regulations and directives.

The studies were conducted by considering the following:

- The various environmental attributes were divided into primary and secondary studies
- Primary attributes such as air environment, water, soil noise, flora and fauna
- Micro-meteorology were assesses by conducting field studies, on-site monitoring
- Review of the past studies conducted
- Secondary attributes such as land use studies, geology, physiological characteristics
- Socio-economic environment have been assessed by literature review of previous studies conducted by various Government publications etc.
- A reconnaissance survey was conducted to identify the sampling locations on the basis of:
- Locations of villages / towns / sensitive areas for noise, air, socio economics
- Accessibility of power connection and security for monitoring equipment, pollution
- Pockets in the area; and
- Areas that best represent the baseline conditions.

The scoping and the extent of data generation were formulated with interdisciplinary team discussions, criteria questions and professional judgment.

The field data generated has been used to

- Identify extent of impacts on natural resources and nearby communities

- Identify mitigation measures and monitoring equipment

These data can be used to prognosticate possible future impacts on environment and lead to suggesting suitable measures to stem or minimize the adverse impact (if any) as far as possible.

4.3 Physical Environment

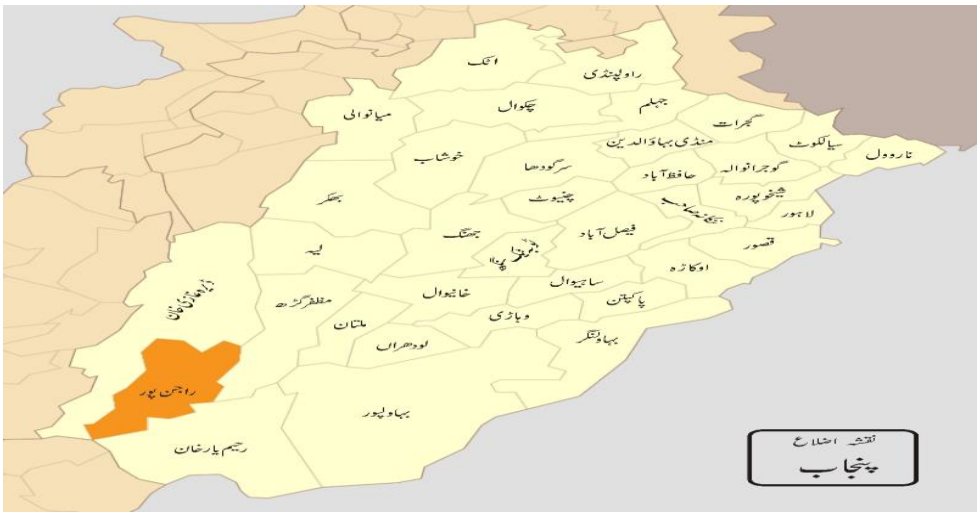
This part examines the physical resources such as topography, soil, climate, surface and ground water resources and quality, ambient air quality and geology of not only the Project site but also the city as a whole to assess whether the project under assessment can or does have any impacts on any of these parameters.

4.4 Geological Formation

Major Rod-Kohi areas traversed by hill torrents constitute nearly 65 percent of the total area of Pakistan and encompass entire Balochistan i.e. (Makran coastal Basin and Kharan closed Desert Basin). The other major hill torrent areas include D.G.Khan and D.I.Khan, FATA and AJK. In Sindh province, the systems are spread in Dadu district (Kirthar range). There are around 17,130,000 acres (69,300 km2) as the potential area under hill torrent / Rod-Kohi / Sailaba fanning excluding riverine areas. Indigenous Spate Irrigation/ hill torrent-irrigation systems traditionally called Rod-Kohi. Rod means water channel and Kohi pertains to mountains. In these areas major constraint is the use of flood flow which is highly variable in quantity and distribution, both in time and space

4.5 Geographical Location

Rajanpur District derives its name from the town of Rajanpur which was founded by Makhdoom Sheikh Rajan Shah about 1770. Rajanpur District was carved out from Dera Ghazi Khan District in 1982. Rajanpur is situated on the right bank (west side) of River Indus. It is bounded on the north by Dera Ghazi Khan District, to the west by DeraBugti District of Balochistan, to the east by Muzaffargarh and Rahim Yar Khan districts, in the south lies Kashmore District of Sindh Province. The Sulaiman Mountains rise to the west of the district.



Location of Rajanpur city

4.6 Climate

Rajanpur has a desert climate. During the year, there is virtually no rainfall. The Köppen-Geiger climate classification is BWh. The average temperature in Rajanpur is **26.0 °C.** Precipitation here averages 205 mm.

4.7 Wind Direction

The Rajanpur 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

4.8 Ambient Air Quality

Atmospheric pollution particularly in urban area has a strong impact upon daily life. Rajanpur economic growth, industrial & transport increase and rising energy consumption are causing the increase in air pollution. The main sources of air pollution are exhaust from motor vehicles and industries. SO_2, NO_2, CO_2, CO, O_3, Particulate Matter (PM) and noise are investigated as the pollution indicators.

The overall air quality in the study area is of moderate nature. Dust particles along with oxides of nitrogen, sulfur and carbon are the major causes of air pollution in the ambient air quality. It was observed during the visit that Petrol and Diesel operated vehicles are

emitting smoke and exhaust gasses in excessive quantity which is source of environmental pollution and responsible for the air quality deterioration. These vehicles are not maintained properly and emit harmful particles in the air due to incomplete combustion.

4.9 Noise Level

The affluent areas of Rajanpur are quieter than rest of the city; the noise level in these areas is still far higher than the standards set by the World Health Organization and the Pak-EPA. Noise pollution in the city is on the rise with most residents complaining that the noise is becoming a public nuisance.

4.10 Water Resource

The existing water supply network covers 70% of the town and serves 70% of the total population. Whereas rest of the area is without it and people have their own sources of water mostly hand pumps / power pumps. The quality of water from this shallow source is not so good and is mostly contaminated and whole city is facing acute water supply problems

4.11 Biological Environment& Ecological Features

Main Crops

Sugarcane, Wheat, Rice, Maize and Cotton are the major crops grown in the district. Production of these crops during the period 2005-06 to 2007-08 is given in Table

PRODUCTION OF MAJOR CROPS
(2005-06 to 2007-08)

CROP	PRODUCTION (000 M.TONS)		
	2005-06	2006-07	2007-08
Sugarcane	2598	3524	3248
Wheat	529	545	469
Rice (cleaned)	64	63	73
Maize	41	70	76
Cotton (000 Bales)	12	15	11

Source: Directorate of Agriculture, Crop Reporting Service, Punjab.

Besides, Ground Nut, Jawar, Bajra, Guar Seed, Sunflower, Moong, Mash, Masoor, Gram and Oil Seed such as Rape / Mustard are also grown in minor quantities in the district.

Main Fruits

Citrus, Guavas and Mangoes are major fruits grown in the district. Production of these fruits during the period 2005-06 to 2007-08 is given in Table

PRODUCTION OF MAJOR FRUITS
(2005-06 to 2007-08)

FRUIT	PRODUCTION (M.TONS)		
	2005-06	2006-07	2007-08
Citrus	1276400	536433	1174354
Guavas	18756	20192	16158
Mangoes	1344	1194	1493

Source: Directorate of Agriculture, Crop Reporting Service, Punjab.

Besides, Jaman, Pears, Dates, Pomegranate, Phalsa and Almond are also grown in minor quantities in the district

Main Vegetable

Turnip, Onion, Cauliflower, Potatoes and Tomatoes are major vegetables grown in the district. Production of these vegetables during the period 2005-06 to 2007-08 is given in Table

Besides, Ladyfinger, Carrot, Bottle Gourd, Bitter Gourd, Chillies, Peas and Garlic are also grown in the district in minor quantities.

PRODUCTION OF MAJOR VEGETABLES
(2005-06 to 2007-08)

VEGETABLE	PRODUCTION (M.TONS)		
	2005-06	2006-07	2007-08
Turnip	18896	17696	16617
Onion	6271	6136	7054
Cauliflower	4899	5501	4852
Potatoes	1507	4056	4417
Tomato	2239	1960	2986

Source : Directorate of Agriculture, Crop Reporting Service, Punjab.

Forests

An area of 585 Hectares is under forests, which is about 0.18 % of the total area of the district. There is also linear plantation of 1622 Km alongside the 11 roads/rails/canals in the district. Trees grown in the area are kikar and shisham.

4.12 Livestock Population

Animal Population

The animal population of the district is given in Table

ANIMAL POPULATION

ANIMAL	POPULATION (000 HEADS)
Goats	588
Cattle	575
Sheep	134
Buffaloes	688

Source: Punjab Development Statistics 2008.

Poultry Population

As per Punjab Development Statistics 2008, there are 1137 broiler and 102 layer poultry farms in the district having rearing capacity of 36512 and 536 thousand birds respectively. There are also 7 breeding farms having rearing capacity of 480 thousand birds.

4.13 Fauna and Flora

The fauna and flora of the area include: the van (selvadoraabeoides), Kari (salsolafostids), Jand (Prosopisspicigera) and malla (Zigyplusnummularia), together forming the jungle with which the uncultivated lands are generally covered. Wolves are common in the district, Jackals are numerous everywhere, and do considerable damage to the crops, especially to maize and sugarcane. Wild boar is also found in abundance and damages the crops in villages near the river. Foxes and wild cats also thrive in the area.

Inventory Flora of Rajanpur

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.

Inventory of some Fauna at Rajanpur

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*

4.14 Birds

Among the birds Chikor and Sissi are very common. The grey partridges are found in many places but black only here and there in the riverain. Ducks of many kinds are found on the river and on the ponds in the jungle. The real shovellers and smaller kind of pochards come early and stay late in winter. The mallard, like the geese, tune up with the colder weather and some birds like the red- crested pochards are seen usually at the end of season.

4.15 Socioeconomic Environment

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

4.16 Demographic Profile

Rajanpur is the headquarters of Rajanpur District and Tehsil, is located in the extreme southwest part of Punjab, Pakistan (29:06N, 70:19E) with a geographical span of 12,319 km2. It is one of the only two districts of Punjab located west of the Indus River. The land is sandwiched by river Indus on one side, while the Sulaimanmountains range on the other. According to the National Census Report 1998, it had a population of 1,103,618 of which 14.27% were urban. Under the local administrative break up, whole district is divided into three Tehsils and 43 Union Councils (UCs).

The most widely used first language of the district is Saraiki, spoken by 76% of the population. Balochi is spoken by 17%, Punjabi – by 3.3% and Urdu – by 3.2%. The major tribes in this district are Jat, Arain, Rajput and Baloch

4.17 Language

As per the 1998 census of Pakistan, the following are the demographics of the Rajanpur district, by spoken language:

Punjabi language: 94%

Other: 6% e.g. **Ranghari**/Haryanvi specially in Phullarwan.

Urdu is mother tongue of few people but being national language is spoken and understood by most of the population.

4.18Irrigation

Rod-Kohi or hill torrent cultivation is a unique system of agriculture being practiced in all the four provinces. In NWFP, D.I.Khan tract represents the major part of the system fed by five large tributaries locally named as "Zams". In the Punjab, major part of the system falls in the districts of D.G.Khan, Rajanpur and Jampur. In Balochistan, this

system falls in the districts of Barkhan, Musakhail, Loralai, Zhob, Bolan and Lasbella. In Sindh province; the system is spread in Dadu&Larkana district (Kirthar range). The largest area under the system of agriculture lies in Balochistan.

4.20 Places

Mithankot is the shrine of the great Sufi Saraiki poet Khawaja Ghulam Farid is the historical place in KotMithan. Thousands of his disciples come to Rajanpur every year on the anniversary of Hazrat Khawaja Ghulam Farid.

Fazilpur is the shrine of the great Peer/Sufi Hazrat Chan Charagh Shah Sain a.k.a. Ghorrey Shah Sain is the historical place in Fazilpur. Fazilpur is situated in the center (heart) of District Rajanpur. And its importance in district Rajanpur is like heart in every field specially politics. Major caste living in Fazilpur are Gopang, Mastoi, Mohajir (Yusafzai, Sherwani, Lodhi, Qureshi), Dreshak, Korai, Thaheem, Bhatti, Zargar(Sunara) and Mughal Pathan.

Harrand Fort

This fort, built in British era, is situated in the tribal area of Rajanpur.

Lalgarh

Lalgarh is situated in the foot-hills of Suleman Range mountains.[9] It is HQ of Gorchani tribe. It is a small village having a population of about 3000 inhabitants. Government offices include a Police Station, a Higher Secondary School, a Girl's Middle School, a Civil Dispensary, a Veterinary Dispensary, a Telephone Exchange & NADRA office.

4.21 Health Facilities/ Quality of Life

The city of Rajanpur in Punjab Province of Pakistan is served by a number of private and government hospitals offering world class medical facilities. The rural and urban areas are served by various other medical centers and dispensaries offering modern medical facilities. The hospitals, dispensaries and medical centers in Rajanpur aim to provide the citizens best medical facilities and prevention from contagious and other harmful diseases**.** There is no health facility or any dispensary near the project area.

4.22 Educational Facilities

Rajanpur has a total of 1,160 government schools out of which 41 percent (480 schools) are for girl students. The district has an enrolment of 148,746 in public sector schools

4.23 Power Supply

There are 15 grid stations in the district ranging in capacity from 66 KV to 132 KV and one grid station of 220 KV capacities is under installation in the district.

4.24Business

Rajanpur is also famous for its cotton business. There are many cotton industries in this district which play an essential role to fulfill the needs of cotton for textile mills. However, some of the people also do agricultural work, which is a leading business of Rajanpur.

4.29 Sewerage and Drainage

The coverage of the sewerage facility is approximately 80% of the area. The sewer capacity is not adequate to handle the quantities of sullage water generated and the sewers frequently overflow. The sewerage system of Rajanpur is divided into five zones. Each zone has an independent disposal station, which discharges untreated sewage to two seepage drains, one on the west side and the other on the east side of the city.

CHAPTER V: STAKEHOLDERS CONSULTATION

5.1 General

Consultation with the stakeholders is a tool for managing two-way communication between the project sponsor and the affected public. Its goal is to improve decision-making and build understanding by actively involving individuals, groups and organizations, which have a stake in the project. This involvement increases project's long-term viability and enhances its benefits to locally affected people and other stakeholders.

Public consultation is one of the key components of the environmental assessment. The EA team conducted public consultations in project and study area. The approach involved a mix of conventional as well as participatory/ rapid rural appraisal (PRA/ RRA), focus group discussions (FGD) and one-to-one interviews. Accordingly, as first step, the literature and secondary data was reviewed. Local people and concerned Govt. officials were consulted. Public consultations were held during the site visit in 17 February, 2022.

The public consultations were conducted with the following objectives: (i) to intrude awareness of the stakeholders about the project and to collect their opinion, suggestions for planning and designing of the project (ii) to identify the need and concern of the public, (iii) to assess cultural patterns and behavior of local communities. Stakeholder consultation was targeted at people/communities who may – directly or indirectly, positively or negatively- be affected by the outcomes of a project. The consultations were conducted at two different tiers of stakeholders: local people and Government Officials. Stakeholders concerns are summarized in the following two parts: (i) consultations with Government officials and (ii) consultation with local people.

In order to evaluate the socioeconomic and environmental impacts, field surveys are extremely essential. In addition to the surveys at the preliminary stage, consultation with the community and their active participation plays a vital role in successful implementation of the project. To identify the different types of stakeholders and ascertain their perceptions about the project were measured. A social impact assessment

survey was conducted. Informal group discussions were also held as an additional tool for obtaining feedback from the stakeholders that are being discussed in the following pages.

5.1.1 What is stakeholder engagement and why is it important?

Stakeholder engagement helps organizations to proactively consider the needs and desires of anyone who has a stake in their organization, which can foster connections, trust, confidence, and buy-in for your organization's key initiatives.

5.1.2 Proponent

Mr. Irfan Hameed Khan S/o Abdul Hameed Khan is the proponent of "Proposed project which is Indus-Valley Industrial Junction Special Economic Zone at Village Suri, Sub Tehsil Shahwali, Tehsil Rojhan, District Rajanpur, Punjab".

5.1.3 The responsible authority

Mr. Irfan Hameed Khan S/o Abdul Hameed Khan is also the responsible authority for the said project either its implementation, procedure with SOPs, manage the team or following Environmental protocols.

5.1.4 Other departments and agencies

The project is Indus-Valley Industrial Junction Special Economic Zone at Village Suri, Sub Tehsil Shahwali, Tehsil Rojhan, District Rajanpur, Punjab" which is an open land and proponent has applied for Environmental Approval while there is no further TMA which has been involved for map approval. Further project is no needed any Govt. department or agencies.

5.1.6 Environmental practitioners and experts

Environmental health practitioners are dedicated to protecting public health by monitoring and recommending solutions to reduce pollution levels. They use specialized equipment to measure the levels of contaminants in air, water and soil, as well as noise and radiation levels. For this sake Environmental lab was hired to measure the ambient air quality parameters, noise level and water analysis of the area. The results were within the limits set by EPA, Punjab (Lab reports are attached in file). Further during whole

construction phase and in operational phase Environmental Expert will conduct the monitoring to access the quality of air etc.

5.1.7 Affected and wider community

The study carried out in village Suri, Sub Tehsil Shahwali and Tehsil Rojhan which made at project site there is no population and community. Moreover project is located in open plot where no fauna and flora will be affected by the project activity during construction as well as during operation.

5.2 Objectives of Consultation

Public consultation plays a vital role in studying the effects of the project on the stakeholders and in the successful implementation and execution of the project. Public involvement is a compulsory feature of environmental assessment, which leads to better and more acceptable decision-making. The objective of the consultation with stakeholders is to help verify the environmental and social issues that have been presumed to arise and to identify those which are not known or are unique to the operation of the project.

The important general objectives of the consultation process are:

- Information dissemination, education, and liaison
- Identification of problems and needs
- Collaborative problem solving
- Reaction, comment and feedback on the Project;
- Documenting mitigation measures proposed by the stakeholders

5.3 Methodology

The discussions were primarily focused on receiving maximum inputs from the participants regarding their acceptability and environmental concerns arising out of the project. Consultation was started with the short description of the upcoming EZ projects and proposed off-site developments for EZ project. The objectives, proposed developments and the possible impacts of the project and the connectivity links of the study area with the project were also explained. The study team recorded their perceptions, demands and recommendations, about the project.

The EIA Team carried out public consultations at various locations within and around the project site. The stakeholder's consultation during this phase of the work targeted the project area, administrative and private offices etc. near the project area:

- Selection of the stakeholders for consultation, reconnaissance of the project site and initial discussions with the neighboring villagers, drivers etc.
- Appraising the targeted stakeholders initially for the purpose of consultation and working out a schedule for holding regular consultation meetings
- Distribution of questionnaires to obtain opinions and concerns
- Meetings with the stakeholders through the participation of environmental consultants and social specialists and documenting the opinions of the stakeholders expressed during the meetings etc.

5.4 Categories of Stakeholders Consulted

The stakeholders contacted during the survey belonged to different categories of people as shown in the Table 5.1.

Table 5.1: Categories and location of Stakeholders Interviewed in the Project Area

Location	Proposed Development	Remarks	Date
Village Suri	Economic zone, Bund construction, access road & land filling	Nearby Village	17-02-2022
Kashmor		Outside of area	17-02-2022
Rojan		Commercial area	17-02-2022
Shahwali		Commercial area	18-02-2022
Rajanpur		Government Department (EPA) & Forest Department	18-02-2022

5.5 Issues Discussed/ Pubic Consultation and Disclosure Meetings

Discussions carried out during public consultation meeting, response of local people and government officials and conclusions are given below in table mentioned below. Photographs of public consultation are also presented in this chapter. questionnaires of

the participants of Public consultation held at villages Suri, Kashmor and Rojhan, Shahwali and Rajanpur are attached herewith this report as an Annexure.

Following issues were discussed during the stakeholder consultation:

- Overall activities of the project
- Possible impacts on natural vegetation, land and properties
- Possible mitigation measures
- Benefits or implications of the project specifically for the local people
- Education, lifestyle, jobs and salaries which directly reflects the people's life style living around the industrial area.

5.6 Findings of the Overall Discussion

- After making complete feasibility the site is being used for industrial activities.
- The project helps to provide a safe and environment friendly area for manufacturing of medicines. It enhance the socioeconomic conditions/values of the area
- Project increases revenue generation for the Government
- It create employment opportunities
- Local people should be given preference for employment in the project

Since the project is planned to be established in an existing industrial area. Majority of people favored the project in a sense that the project overcomes the increasing need medicines demand in market.

5.7 Socioeconomic Trends around the Project Site

Socioeconomic status (SES) is an economic and sociological combined total measure of a person's work and of an individual's or family's economic and social position in relation to others, based on income, education, and occupation. This chapter includes the information that how the present study has been conducted and what are the results of this socioeconomic survey in the surrounding areas of project.

5.8 Study Population

The target population was comprised of workers and household of surrounding around the project.

Study Size

Therefore, approximately a total of 15 different socio-economic conditions were surveyed and nearby labor people are our main respondents from different areas while most of people were illiterate and they just gave their comments.

Study Instrument

Data collection tool was questionnaire; it was a 15- items based semi structured questionnaire.

Sampling Procedure for Questionnaire

Procedure

Before filling the questionnaire respondents were fully assured that their data will not be disclosed. They were told about the purpose of study. They were also told if they have any problem to understand the questions in questionnaire can ask**.**

Statistics Measures

After preparing the questionnaire, field surveys were conducted. The data selected from questionnaire was analyzed by using SPSS version 16. The data collected with the help of questionnaire was analyzed in SPSS to get the descriptions of current study. A part of questionnaire has been adopted from SF-36, a standard question to evaluate physic-social-health status and project awareness.

Study Areas

Somehow at surrounding area was visited for socio-economic aspects. Detail of these sited are discussed below. These areas were surveyed by team of experts as per requirement of socioeconomic survey for Environmental Impact Assessment Report of project.

Description of Tables:

In the following table, only frequency and percentage has been measured (by SPSS) of those parameters which are probably present in maximum quantity.

Table 5.2: Socioeconomic Questionnaire

Sr. #	Variables	Frequency	Percent (%)
1	Name & Address	-	-
2	Date	-	-
3	Address & CNIC	-	-
4	Age	91 (above 30 years)	90.3%
5	Education	98 (under metric)	97.8
6	Occupation	96 (Private jobs)	95.9
7	Marital Status	97 (married)	96.9
8	If married then no. of children	81 (> 3)	80.7
9	Total Family members	86 (< 2)	85.1
11	No. of earning members in family	88 (< 3)	88
12	Total income	97 (> 25 PKR)	96.3
13	Source of income	99 (Private jobs)	99

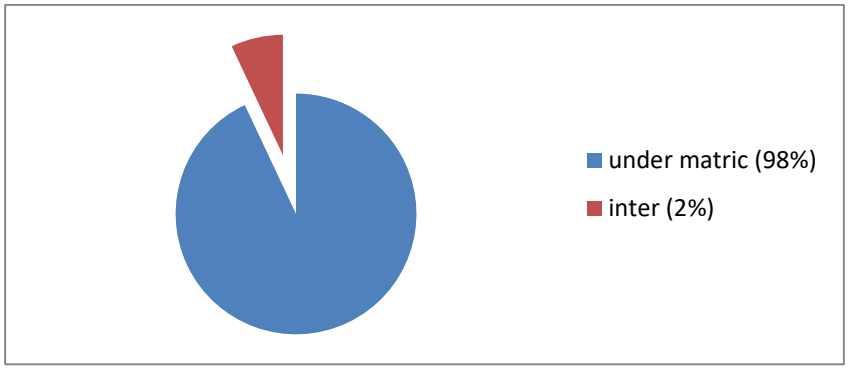


Figure: 5.1 Graphical Presentation of Education around the Project Site

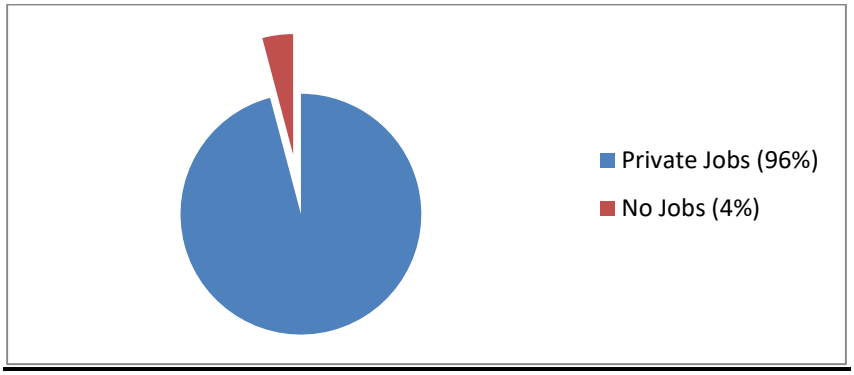


Figure: 5.2 Trends of jobs around the project site

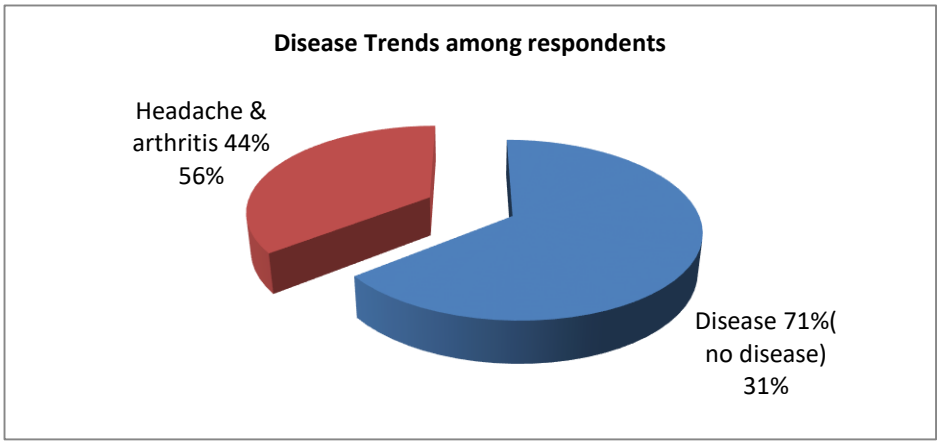
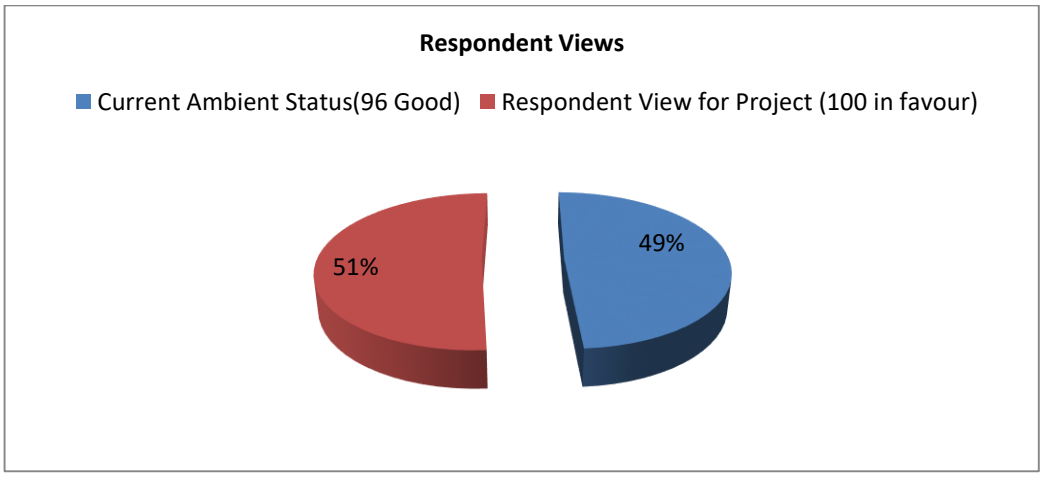


Figure: 5.3 Health Status of Respondents



5.4 Respondent View about Project

5.9 Stakeholder Concerns and Recommendations

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

5.9.1 Project Approval

The community consultations demonstrated that goodwill towards the project proponent indeed exists. Approval for project activities by communities was evident. The consultations were considered a good gesture and were appreciated; especially by men and women. The poverty level is such that communities are looking forward to any project proponent to improve their financial well-being to a great extent. Benefit from the project should be distributed judiciously and equitably among the primary stakeholders in the project area, and the proponent will continue to ensure that this principle is followed in this project and community development program.

5.9.2 Local Employment

Communities in the project area emphasized that local inhabitants should be given priority when employing people for related works and activities according to their skills.

5.9.3 Compensation

Compensation shall be paid for any damage if it is there. The compensation process should be transparent.

5.10 Findings and Conclusion

Results of socioeconomic survey showed that setting up a SEZ with different blocks will generate different jobs whatsoever, interalia for the following reasons:

- The building will be constructed on a vacant land
- The machinery will be installed after construction of building

Table: 5.3 Proceedings of Public Consultation and Disclosure Meetings

Sr.#	Villages	Villagers Comments	Conclusion
1	Tehsil Rojhan	➢ It is nearby village with 100% Muslim population. Major occupation is poultry and cattle, small business and jobs like drivers etc. Income per family is 10,000 to 15,000 per month. . ➢ No factory emitting bad odour should come up in the EZ area like (poultry farm & feed factory). ➢ Local people should be provided employment in the industries in upcoming EZ preferably. ➢ Skill enhancement training should be given to villagers by industries so that they can work in those industries. ➢ Only non-polluting industries should come up in this region and measures should be taken by industries to control the pollution levels	➢ People are aware about the upcoming EZ project. Source of information is surveys carried out by SIA team and newspapers. ➢ Majority of people have positive attitude towards the project ➢ People expect employment generation for them from upcoming EZ project ➢ People also expect infrastructure development such as good roads, water supply, power supply in their area after coming up of EZ zone ➢ People expectsoverall development of the area after development of EZ project People expects coming up of less polluting industries so as no pollution related problems are observed in the area.
2	Kashmor	➢ It is nearest village with app 45% families are Muslims and rest are Hindu families. 1-2 Buddhist	➢ People are aware about the upcoming EZ project. Source of information is

		families also resides in this village. Major occupation of people is agriculture/aquaculture small business and jobs like drivers etc. ➢ People are educated. Most of the people obtain basic education minimum but high level of unemployment is in the area. ➢ People are aware about the project and expect good employment generation from the EZ. ➢ They emphasized that polluting industries should not be set up in the EZ zone. ➢ Pollution should be managed by upcoming industries so that no health hazards should be generated for local people. ➢ Employment should be given to women also as they are educated and interested in working	surveys carried out by SIA team and newspapers. ➢ Majority of people have positive attitude towards the project ➢ People expect employment generation for them from upcoming EZ project ➢ People also expect infrastructure development such as good roads, water supply, power supply in their area after coming up of EZ zone ➢ People expectsoverall development of the area after development of EZ project People expects coming up of less polluting industries so as no pollution related problems are observed in the area.
3	Railway Department, Rajanpur	➢ Director in Railway department was consulted and he asked that development of EZ is good for society as it will provide employment to the people and will also reduce dependence on Planted and natural forest. ➢ Only non polluting industries with	➢ EZ will be beneficial for the region as it will lead to overall development of the area. But measures should be taken during development and operation phase of EZ so that impact on environment and forest

		all pollution control devices should come up in the zone.	can be minimized. Maximum plants should be planted

Figure: 5.5 Pictorial Evidence during Public Consultation



Important issues and concerns raised during consultation

Public consultation is a process that involves the public in providing their views and feedback on a proposal to consider in the decision-making. The public consultation was done around the project area and public was uneducated, slightly educated and metric

pass mostly. The people have no job and if they have they are unsatisfied. The basic challenges during public consultation were as following;

- People were feeling shy to expose their jobs, salary etc
- People were unable to express the actual problems
- People are scary as well how we are collecting the data
- People were resistive at somehow
- Some people were happy if project will be here then they can get job near home
- Some people were interested only having the job and better future
- It is nearby village with 100% Muslim population. Major occupation is poultry and cattle, small business and jobs like drivers etc. Income per family is 10,000 to 15,000 per month.
- Skill enhancement training should be given to villagers by industry so that they can work in this project.

1. Proponent's Environmental Management Team

Environmental management team along with their roles and responsibilities (by name and position)

An Environmental Management System (EMS) is a framework that helps an organization achieve its environmental goals through consistent review, evaluation, and improvement of its environmental performance. The Environment Management System will comprise on four persons. Their names, roles and designation is mentioned below;

Sr. #	Names of Persons	Roles and Responsibilities	Designations	Qualification
1	Muhammad Anus	An environmentalist is a person who is concerned with protecting and preserving the natural environment, for example by preventing pollution	Environmental officer	Master in Environmental Sciences
2	Muhammad Nawaz	• Perception and awareness of environment	Environmental Manager	Master in Environment

		• Environmental education and training • Resource management • Environmental impact assessment • Control over environmental degradation and pollution • Ecosystem Approach • Human Ecology Approach • Political Ecology Approach		with some additional experience like in waste management or resource management
3	Muhammad Akmal	A Health and Safety Officer (HSO) is responsible for minimizing or removing the risk of accidents, work-related illnesses and injuries in the workplace. They maintain the safety information of an organization and promote safety compliance by shaping new protocols and strengthening existing health and safety policies.	Health and Safety Officer	Environmental Engineer with OSHA or NEBOSH
4	Muhammad Adil	Make sure the quality environment of the system under Environmental Protocols	Environmentalist	Master in Environmental Sciences with additional experience of quality control

The responsible authority

The responsible authority will be proponent and SEZ team.

Affected and wider community

The study carried out in Rajanpur near the project site which made at project site there is no population and community. Moreover project is located in open area and where no fauna and flora will be affected by the project activity during construction as well as during operation.

CHAPTER 6: SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Screening of potential environmental impacts assessment was carried out considering present environmental setting of the project area, and nature and extent of the proposed activities. Proposed project involves development of SEZ. The environmental impacts associated with SEZ and each of the proposed EZ is classified as: (i) impacts during design and construction phase and ii) impacts during operation phase/Post-construction phase. Sensitive environmental and social components were identified during the site visits and qualitative and quantitative techniques have been applied for direct and indirect assessment of impacts on the identified environmental and social sensitive components. Impacts are classified as being insignificant, minor, moderate and major. Some of the important impacts associated with the proposed SEZ and off-site facilities for economic zone will be associated with land use (diversion of land use), land stability (soil erosion), soil compaction and contamination, water availability, ground water contamination, waste and wastewater disposal, ambient air quality, ambient noise levels, vegetation, fauna (terrestrial and aquatic), drainage pattern, hydrology, socio economic, places of social/cultural importance (religious structures, community structure), construction material sourcing and occupational health and safety. Adequate mitigation measures are devised to mitigate/minimize all likely environmental impacts and the same have been presented along with the impacts.

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 project 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)

6.1 What is the problem

The Proposed project is an Indus-Valley Industrial Junction Special Economic Zone at Village Suri, Sub Tehsil Shahwali, Tehsil Rojhan, District Rajanpur, Punjab which involves to successfully undertake activities with a high marginal impact on the attraction and sustainability of private, productive investments, in a set of sectors which collectively promise Pakistan massive employment, much greater industrialization, greater export potential, diversification into knowledge-based sectors, and a new level of global economic connectivity through effective policy advocacy, investment facilitation and promotion. Said project is mega project and the only problem can be considered if management will not be proper, SOPs will not be followed and protocols will consider non-seriously.

6.2 When will problem occur and when it should be addressed

The problem will occur when proper check and balance will neglect and audit will not be preferred. It can be addressed by making regular audits, following SOPs and protocols. Said project is Indus-Valley Industrial Junction Special Economic Zone at Village Suri, Sub Tehsil Shahwali, Tehsil Rojhan, District Rajanpur, Punjab wjich has different blocks like commercial, industrial, residential etc which all have different protocols and SOPs which can be addressed only when audits and administration is proper.

6.3 Where problem should be addressed

There will be team who were addressed and well oriented with all procedure, SOPs, protocols and management rules. Every person in staff will be fully committed to his

duty. If any person feel problem in system then he will directly address this to managing director who will resolve the problem according to its ranked person.

How the problem should be addressed

- Clearly define the problem.
- Don't jump to conclusions.
- Try different approaches.
- Don't take it personally.
- Get the right people in the room.
- Document everything.
- Bring a facilitator.
- Develop your problem solving skills.

6.4 Environmental Problems Due to Project Location

Project location is Indus-Valley Industrial Junction Special Economic Zone at Village Suri, Sub Tehsil Shahwali, Tehsil Rojhan, District Rajanpur, Punjab. Environmental impacts due to project location have been studied and adequate mitigation measures have been proposed.

A detailed explanation of each potential impact is given in table;

Table 6.1: 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 open area near Tri Border and Shahwali dry port which is actually railway dry port. Kashmor is in its adjacent. 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 domain 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 SEZ. The main pressure of resources at the project site is availability all fundamentals for residential, commercial, industrial and educational etc activities.
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 land is open area and in surrounding there is no population, settlement, biodiversity etc which can be displace. So project is environment friendly in this aspect.
5.	**Accessibility Issues to the Local Community**	
	Another important impact considered	The project site is surrounded by open area

	was obstruction or changes in the patterns of transportation and increase travel time/distance for the local community.	and project is idea in that aspect that it is in access of public. Like it is located in village Suri which is directly connected to Kashmor, Sub Tehsil Shahwali and in its adjacent there is Tri-Border. Railway Dry Port track is in its front. Thus project is located in ideal point where it is connected to city and rest of cities of Pakistan.
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 surrounding of 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 project.

6.5 Environmental Impacts due to IVI Junction SEZ, Shahwali

6.5.1 Impacts due to Development of SEZ

A. Construction Phase: Development of the economic zone and the off-site facilities, i.e. access road, site filling, boundary wall and administration building will involve leveling of site by filling, civil construction activities, storage of raw materials like fuel, sand, aggregates, cement, reinforcement etc., storage of debris, excavation of soil etc. All these activities have potential to impact the environment in one or other way. These activities can directly and indirectly impact the environment. Following environmental

attributes will be impacted due to SEZ development during construction. Impacts on these attributes are discussed in detail in sections below;

- Impact on air quality
- Impact on water resources
- Impact on surface water quality
- Impact on hydrology & drainage
- Impact on noise environment
- Impact on flora & fauna
- Impact on Land Use, drainage & hydrology
- Impact on topography, soil quality, soil erosion & geology
- Impact on Socio-Economy

B. Operation Phase:

After development of economic zone, it is expected that industries will start coming up in this region and EZ may reach its full capacity in 4-5 years time. Construction and operation of the industries may have impact on the environment and society. Following environmental attributes will be impacted due to SEZ development during operation phase. Impacts on these attributes is discussed in detail in sections below

- Impacts on Air Quality
- Impacts on Noise Level
- Impacts on Water Quality
- Impacts on Ground Water Resources
- Impacts on Socio-economy
- Impact on Land Use

6.5.2 Impact on Air Environment

A. Pre-construction Phase: Pre-construction phase will involve site clearance, leveling & filling activities for development of EZ, and access road. Clearance of site will involve removal of land leveling & filling activities. These activities will lead to dust generation. But these emissions will be limited to the site only and have impact for short duration

only during clearance activity. To minimize the dust generation, water should be sprinkled regularly at the site and low sulphur diesel should be used in land leveling equipments to control the SO2 emissions.

B. Construction Phase: The proposed project involves construction activities like site development, civil construction, construction material handling and stocking, and construction vehicle movement will generate fugitive dust and vehicular emissions. However, these ground sourced generation will be limited to the construction site and the impact will be short duration that too during construction activities only. The likely emission from construction vehicle, machinery, and generators is likely to be insignificant as the pollutant emission activities (point and area sources) will be limited within the project boundary and the activities will be short term (only for construction period). However, this impact may further be minimized by adopting following mitigation measures.

Mitigation Measures

- Sprinkling of water at construction site and haul roads
- Covering the scaffolding (in case of administration building) to reduce the dust emission in outside environment
- Provision of face mask to workers to minimize inhalation of dust particles
- Construction vehicles and machinery should be regularly serviced and check for pollution control
- Low sulphur diesel should be used for running construction equipment and vehicles
- Adequate parking space should be provided for the construction vehicles so as to prevent idling of the vehicles and the emissions generating from them
- Vehicles carrying construction material and debris should be covered with tarpaulin cover
- Raw materials, excavated soil and other debris should be stored under covered sheds
- Green buffer should be developed all along the SEZ boundary
- Plantation should be carried out along the both side of access road

C. Operation Phase: Development of SEZ access road will reduce the dust emissions that results from movement on the earthen roads. No adverse impact is anticipated on air quality during operation phase due to development. Post development of the economic zone & setting up of industries, there could be some impacts on the air quality of the area. Industrial development will involve generation of emissions, and increased vehicular movements. These altogether may have overall negative impact on the air quality of the site and the nearby areas. The industries proposed as per the pre-feasibility study are light engineering, food processing and textile industries. Significant air emissions result from light-engineering industries. These are particulate matter, sulphur dioxide, metals and other criteria pollutants like ozone, oxides of nitrogen and carbon monoxide. Lead may be generated in some of the processes.

Air emissions from food processing industry will contain some volatile organic compounds but do not contain any hazardous compounds. These industries emit low process-air emissions. Most processes uses electrical power and rarely emit harmful compounds to environment.

Mitigation Measures

- Provision shall be made for peripheral green belt all along the SEZ boundary. No development zone of 5 m width & retaining wall will be developed all along the SEZ. Green buffer will be developed in this no development zone. Green belt shall have minimum of three rows of local variety of tree.
- Tree species shall be selected such that first inside row is of smaller height, middle row of tree is of medium height and last row of tree is of higher height so that green belt formed appears like a canopy.
- Development of thick green belt (10 m) and organized greens within each industrial plot
- Power Generators should be provided with stacks of adequate height (higher than nearest building) to allow enough dispersion of emission.
- Process emission if any shall be control with the installation of adequate air pollution control systems

- No red category industries should be allowed within industrial zone
- Air pollution monitoring should be carried out quarterly by all industries to check the air pollution level.
- Preference of usage of clean fuel like LPG, low sulphur diesel should be explored
- Energy conservation should be adopted by adopting the alternate energy options like solar power.
- Odor should be managed at the site using odor suppressant and planting fragrant flowering trees.

6.5.3 Impact on Noise Environment

A. Pre-construction & Construction Phase:

Pre-construction phase will involve site clearance activity for development of off-site facilities, administration building and site preparation activities. Clearance of site will involve removal of land leveling activities. Operation of different machineries and equipments for construction activities, running of heavy load traffic for construction materials transportation, and regular traffic movement may generate noise during construction period. The produced noise may have impact on existing acoustic environment.

Mitigation Measures:

- Machinery to be used should comply with the noise standards prescribed by standards.
- DG set shall be acoustic treated
- Workers shall be given PPE (ear plugs), if working in high noise area
- No noise generating activity shall be carried out in the night.
- No construction activities to be undertaken during night hours to prevent any disturbance to nearby residents and labours in labour camps.
- Acoustic enclosures should be provided with DG sets and machinery to control the noise levels at construction site.
- Temporary noise barriers should be provided near the high noise generating areas

B. Operation Phase

After construction of the road and upcoming economic zone, traffic in the area will increase which will increase the noise level of the area. Following mitigation measures should be taken to prevent noise pollution during operation phase

Mitigation Measures

- Avenue plantation should be developed along both the side of access road which will act as noise buffer
- Green buffer of 10 m should be developed all along the project boundary. Green buffer should compose of the 2-3 rows of plants of variable height and thick canopy so as to form continuous barrier. This will help in reducing the noise level significantly.
- Apart from these after development of economic zone, noise will be generated from the construction of individual industries, operation within in industrial units, running DG sets in each units and traffic movement within EZ zone. Following mitigation measures are required to be taken to minimize noise pollution:
- All industries should obtain clearance before establishing industrial unit and should comply with all the conditions mentioned in the letter of environment clearance
- Acoustic treatment and temporary noise barrier should be provided in area generating higher noise levels
- Job rotations should be practiced for workers in industry to prevent prolonged exposure to high noise level as it may lead to deafness, fatigue, head ache, nausea and drowsiness
- Honking should be prohibited within the economic zone

6.5.4 Impacts on Water Resources

A. Pre-Construction & Construction Phase:

6.5.4.1 Impacts on Ground Water Resources:

Significant quantity of water will be required for various construction activities & domestic purpose. Source of water for these activities will be ground water. Measures

should be taken to minimize the water extraction by reducing water consumption and wastage. Mitigation measures are given below.

Mitigation Measures

- Best management practices for conservation of water will be required to be adopted to minimize water wastage and water loss. Best management practices to be adopted are given below:
- Regular inspections at site to monitor leakages in water storage tanks
- Creating awareness among construction workers about the importance of water conservation
- Adoption of the advance technologies and machinery which helps in minimizing water requirement for construction
- Covering the water storage tanks at site to prevent evaporation losses.

6.5.4.2 Impacts on Ground Water Quality

No significant impacts are anticipated on the ground water quality due to development of the off-site facilities for economic zone.

Mitigation Measures

- No sewage or wastewater should be accumulated in any unlined structure
- Timely disposal of the construction/chemical/haz. waste so as to prevent leaching of any pollutant to ground

Operation Phase:

6.5.4.3Impacts on Ground Water Resources:

Expected population for administration building is high. This demand can be fulfilled by withdrawing water through water supply system developed for the project.

Mitigation Measures

- Adoption of best management practices to prevent water wastage and minimize water loss
- Usage of water conservation fixtures to minimize water consumption
- Installation of leakage detection system to minimize the water loss

- Ground water aquifer assessment studies may be undertaken to assess the ground water potential.

6.5.4.4Impacts on Ground Water Quality

No impact on ground water quality is anticipated during operation phase due to off-site developments. After development of economic zone there may be some ground water pollution due to industrial activities. Following measures should be taken to minimize the ground water pollution **Mitigation Measures**

- Each industry should treat the effluents and sewage and should not discharge into ground.
- No leachate, waste water and waste material should be stored in pervious unlined area/pond.
- Ground water quality shall be monitored periodically.

Impacts on Land resources

Pre-construction & Construction Phase:

6.5.5 Impact on Land Use

SEZ site is spread over an area of 129 acres. Land use of this land will be change after development of EZ. Land has now been transferred to Indus Valley Industrial Junction Special Economiz Zone at Shahwali, Rajapur and land documents are attached as Annexure. Thus no land acquisition is involved for the project. Administration building will be developed within the economic zone site. Economic zone will be developed after appointing the developer by IVI SEZ and obtaining permission from EPA Some of the measures are taken to prevent any impact on change in land use

Mitigation Measures

- Tree cutting will be avoided while constructing access road and development of SEZ
- Measures will be taken that no structure along the access road should be affected due to development of SEZ

6.5.51 Impact on Topography & Geology

The site will impact the topography of the site by raising its existing level. Impact will be not be significant as the impact is restricted to EZ zone.

6.5.5.2 Impact on Top Soil & Soil Quality

Development of the structures and construction of the access road may disturb the soil profile of the area. Land will be filled and compacted after filling. Storage of raw material, fuel and construction debris may contaminate the soil thus measures should be taken to prevent the soil pollution. Mitigation measures to be adopted are mentioned below. Contractors are required to take all the proposed mitigation measures.

Mitigation Measures

- No piling of raw material at site
- Raw material will be stored under covered sheds and paved surface
- Fuel storage area should be paved
- Adoption of best management practices to prevent any spillage of raw material
- Construction debris should be stored under covered sheds and paved surface and should be disposed off regularly to designated sites
- Waste from labour camps can be segregated at site. Food waste/wet waste should be composted in pits within the camp site. Recyclable waste should be sold to the authorized dealers and the remaining should be disposed off at designated sites through local agencies responsible for waste management in the area.

6.5.5.3 Impact on landscape and scenic beauty

All construction activities for administration building, land filling & boundary wall will be carried out within economic zone site and will not cause any impact on landscape and scenic beauty. A green buffer of 10 m (minimum three rows of trees) will be developed all around the project site which will enhance the scenic beauty of the area

Constructions activities involved in construction of access road may change the visual landscape of the project area. Site clearance activities and piled construction materials, machinery and camp establishment on green field site may impact the scenic beauty.

Nevertheless, the impact is for a short duration, and reversible as the project plan includes landscape planning, green belt development as well.

Operation Phase

6.5.5.4 Impact on Soil Quality

No impact due to off-site developments is anticipated on soil quality of the project site during operation phase.

After development of economic zone, disposal of industrial domestic and process waste may contaminate land and soil quality of the area. The impact can be significant and long term in case of uncontrolled discharges. Improper disposal of waste (hazardous and non-hazardous waste) may degrade soil, water, noise, air quality and ecology of the area. As per the preliminary planning, it is planned that industries like light engineering, textile and food processing will come up in the EZ zone. These industries are not heavily polluting like tanneries, distilleries etc but generate significant waste both hazardous and non-hazardous in nature, which can pollute the environment if not managed properly. Nature of the waste which can be generated from these industries are discussed below. Waste to be generated from the light engineering industries can be solid and liquid in nature. Solid waste from the food processing industries includes both organic and packaging waste. Organic waste, that is, the rinds, seeds, skin, and bones from raw materials, results from processing operations. Inorganic wastes typically include excessive packaging items that are, plastic, glass, and metal. Solid waste from textiles majorly composed of resins, fabric, apparel, dye, discarded machinery and fibers. These waste required to be collected and disposed off periodically. Lub. oil/waste oil is generated from the machineries as hazardous waste. Mitigation measures are required to be adopted to prevent soil pollution of the area.

Mitigation Measures

- Provision shall be made for proper storage and disposal of industrial waste by receptive industries.
- Common waste storage areas shall be designated for industrial domestic waste.

- A site for disposal of hazardous waste can be identified within the EZ and it should be developed as per the norms

6.5.5.5 Impact on Land Use

No impact due to off-site developments is anticipated on land use of the study area during operation phase. However, post development of economic zone significant change in land use is anticipated in the near- by area. At present there is no significant infrastructure at the EZ site and nearby areas. Some of the other developments including construction of roads, housing facility, commercial areas including hotels, hospital, restaurants, schools, etc may also occur in nearby areas. This will lead to change in land use but will lead to significant development of the area.

Impacts on Agriculture resources

Pre-construction & Construction Phase

No agriculture land is proposed to be acquired for development of proposed off-site activities as well the economic zone. Thus no significant impact on agriculture activities/resources is anticipated due to the project development.

O**peration Phase**

No impact on agriculture resources is anticipated from off-site infrastructure during operation phase.

6.5.6 Impacts on Eco-system

Pre-construction & Construction Phase:

Impact on Terrestrial Flora & Fauna at EZ Site

There is no significant vegetation at the economic zone site. Thus no vegetation removal will be required for construction of administration building, bund and boundary wall.

Mitigation Measures:

- Twice the nos. of trees to be cut should be planted as compensatory plantation in affected areas to minimize the impact on the eco-system.

- No development zone of 5 m should be maintained throughout the length of the canal within EZ site
- No development zone should be planted with Mangroves and other native species

6.5.7 Impacts on Socio-Economy

Pre-construction & Construction Phase

6.5.7.1 Loss of Livelihood & Displacement of Families

No Resettlement and rehabilitation or land acquisition is involved for development of EZ development. Thus no displacement of families is involved with the project development, impact on Health, Aesthetics and Hygiene

Construction activities lead to generation of dust, unpleasant view, obstruction in access of public properties due to excavation etc which may impact the society significantly. Adequate waste management plan, air, soil, noise and water pollution controls are required to be adopted to prevent any impact on society. Also various health hazards are associated with construction activity which may significantly impact the workers if not taken care.

Impact on Infrastructure & Utilities

No sensitive feature like religious structures, school, hospital etc are located along the proposed access road. No impact is anticipated on social sensitive receptors due to construction of access road. Development of EZ will increase pressure on existing facilities and utilities. Traffic on village road will increase during construction phase so it should be ensured that construction vehicle should move only during non-peak hours.

6.5.7.2 Impact on Demographic structure

The demographic profile of Village Suri would not undergo any changes during the construction phase of the EZ, because the inflow of daily laborers would be mainly be from this village or from Shahwali.

6.5.7.3 Generation of Employment

Employment opportunities will be ensured through three channels

(i) Direct employment for unskilled labour,

(ii) Indirect employment to the local community; and

(iii) Direct employment includes site clearance, excavation, loading and offloading of materials and deliveries, mason and construction works. Further, the construction labour force will be requiring food and other items, which is expected to be supplied by the local eateries, retail shops and the local community. The local community members can take advantage of these opportunities. Employment generation benefits improve the quality of life of the labourers and enhance their productivity and living standards. Employment generation, both direct and indirect, through Suri and Shahwali will have a tremendous impact on human development and poverty reduction in the area.

6.5.7.4 Skill Enhancement of Local people

As the both skilled and un-skilled labour will be required during both construction and operation phase of the EZ. SEZ should provide the skill enhancement training to locals to carry out specific tasks and enhance the skill of local people so that they can be given employment.

Mitigation measures are required to be taken to minimize the impact of projects on the society and they are given below:

Mitigation Measures

- Provision of proper training to all workers for handling the construction equipment
- Provision of cautionary and guiding signage in local and English language indicating the hazard associated with the site
- Employment should be provided preferable to local & affected people
- Entry to the fuel storage area and construction equipment rooms should be restricted and should be allowed for trained personnel
- Wastewater from the toilet should be disposed off in septic tanks and soak pits and should not be allowed to accumulate at labour camp site or construction site
- Dustbins should be provided at labour camps for collection of waste and waste should be regularly disposed off through the concerned agency

- Temporary storm water drainage system should also be provided at camp site so as to drain the storm water and prevent accumulation of storm water at site and thus breeding of mosquitoes/flies
- Arrangement of fire-fighting should be made at site and workers should be trained to use the system in case of fire
- Provision of personal protective equipment like safety jackets, helmets, gumboots, gloves, face mask, ear buds, goggles, safety shoes etc as per requirement and nature of job in which they are involved
- Job rotation should be carried out for workers exposed to high noise and dust areas
- Provision of First aid facility at the site and the labour camp
- Labour camps should be located at neat and clean location with no water logging issues
- Clean drinking water supply should be provided to labour
- Regular inspection for hygiene and safety in labour camps should be done
- Compensation should be given to the people as per the policy for the planted tress
- Construction debris should not be allowed to enter into aquaculture ponds located along the road
- Entrance to any road/structure should not be blocked for laying pipeline and construction of access road
- A major segment of the population on the area is unemployed. Construction activity will provide employment to huge nos. of people including skilled, unskilled and non-skilled workers. This will improve the quality of life of people.

Operation Phase

Impact on Health

Post development of the economic zone & setting up of industries, there could be some impacts on the Socio-economic conditions of the area. Industrial development will involve generation of emissions, effluents, waste and increased vehicular movements. These altogether may have overall negative impact on the health of the people and aesthetics of area. But the industries proposed as per the pre- feasibility study are light engineering, food processing and textile industries.. These industries are not heavily

polluting. If appropriate measures for preventing air, water, soil and noise pollution are taken there will be no significant impact on the society.

Poverty alleviation and diversification in livelihood

Vast employment opportunities potentially created by the EZ will reduce poverty via increased income through various livelihood options. By means of industrialization and related trades, diversification of livelihood will occur for all strata of people. Diverse livelihood options for the locals and better wages for the employees of the industrial zone will reduce poverty for many poor households and will contribute to reducing the poverty level in the locality. So, this will enormously benefit cross section of population and both gender.

6.6: Summary of Environmental Problems Associated With Project Construction & Operations

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

Table 6.2: Environmental Impacts/Mitigation Measures during Construction & Operational phase

	POTENTIAL IMPACTS	MITIGATION MEASURES
	Procurement & Setting up of Crushers, Hot-mix plants, other Vehicles, Equipment and Machinery	
	Operating of all equipment and machinery during construction and operation can be harmful if not treated properly	During construction phase Specifications of crushers, hot mix plants and batching plants, other Construction Vehicles, Equipment and Machinery to be procured should comply to the relevant Standards/ norms and with the requirements of the relevant current emission control legislations. Hot mix plants, crushers and batching plants shall be located at adequate distance. Pollution control

		measures for Diesel Generator (DG) set i.e. stack height, acoustic enclosure etc. During operational phase, adequate stack height and emission control devices such as bag house filters, cyclone separators, water scrubbers etc., should be attached. Proper lighting arrangement shall be made around plant site if the plants are operated during dark hours. Provision of readily available first aid kit, fire fighting equipments at the plant site at appropriate location to respond in case of accident during construction and operational phase.
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 like sanitary workers of that area will collect the 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 produce waste which varies and there is a specific point in the SEZ where all sort of solid waste will be dump later on sanitary team of that area will collect this on regular

		basis.
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 varies like in SEZ there will be domestic, industrial, commercial and hospital waste. Every block will have its own wastewater treatment facility.
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 burden on 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 will be followed in every block.
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 open area which is going to SEZ. 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/waste 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 SEZ there 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 open area where there is no biodiversity. Adopting a vegetation program that uses indigenous stocks of local vegetation Proponent is committed to plant the plants after completion of construction work for making the environment friendly and for aesthetic beauty as well.
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 of every block.

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 open area but still the proponent is committed to give job opportunity to the locals of the area. ➢ Reducing potential exposure to emissions.
14	**Air Emissions**	
	By operating the machinery in industrial block, few gases can be emitted like particulate matters, etc.	Air emissions during construction phase will be usually from generator but generator would be maintained and up-to-date to control the air emissions. Electrostatic precipitators and other air pollution control devices will be used in industrial block while in commercial and residential proper tree plantation plan and aesthetic exercises will be done. So by keeping the all protocols, air emissions will be controlled in operational phase of the project.
15	**Vibration and Noise Pollution**	
	Vibration and noise pollution can be produced during construction phase and operational phase if machinery will not be properly look after. The vibration and noise pollution can cause the trouble to surroundings.	The vibration and noise pollution during construction and operational phase will be controlled by grouting the machinery fully and generators will be kept in canopy and will be fully maintained.

6.7 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 6.3: 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

6.8 Social Enhancement Measures

Socio-economic enhancement measures taken proposed project that is SEZ are described below;

6.8.1 How to Measure Social Impact

- Decide on a framework.
- Identify your Metrics.
- Understand your attribution.
- Get the timing right. ...
- Value qualitative data. ...
- Recognize your own accountability. ...
- Be open to learning.

Impact measurement and management includes identifying and considering the positive and negative effects one's business actions have on people and the planet, and then figuring out ways to mitigate the negative and maximize the positive in alignment with one's goals. That why when socioeconomic Performa's and measurement taken then economic and health was assess of surrounding workers and locals.

6.8.2 Health and Safety Program

Health and Safety will be one of the top priorities at SEZ and as a socially responsible organization, they actively seek to impart their best practices in the communities they operate in.

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 establishing 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 7: ENVIRONMENTAL MANAGEMENT & MONITORING PLAN

7.0 SCOPE OF ENVIRONMENTAL MANAGEMENT PLAN

Several measures have been identified in this EIA report to prevent or mitigate the adverse environmental impacts of proposed project that is Indus-Valley Industrial Junction Special Economic Zone at Village Suri, Sub Tehsil Shahwali, Tehsil Rojhan, District Rajanpur, Punjab. To ensure that these measures are incorporated in the construction & operational phase of the project, it is necessary to develop a comprehensive Environmental Management Plan (EMP). The plan addresses the mechanism through which the measures will be implemented; defines the responsibilities of the workers and the management; and lays down the required documentation, communication and reporting procedure.

The EMP consists of a set of mitigation, monitoring and institutional measures to be taken during the design, construction and operation (post-construction) stages of the project. The EMP has been designed keeping in view the regulatory and other requirements to ensure the following:

- Minimum disturbance to the native flora and fauna
- Compliance with the air, water, soil and noise quality norms
- Conservation of water to the extent possible through rain water harvesting, wastewater recycling

Institutional Capacity

Its aims to enhance the capacity building of a system and project by the managing the sources to increase the efficiently effectively. The management work for continues improvement and development of the project to enhance the sustainability of project outcomes. It also includes the management worker and project associated persons to increase their moral by giving them training. Every associated person with the project being motivated with their duties and responsibilities to increase productivity of the project. The key motto is to decrease communication gap from top to bottom hierarchy.
More than 300 person's team of unskilled and skilled workers will be hired. When they will hire, special orientation for two days in regard of work is presented.

7.1 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 construction and operational phase is presented.

7.2 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.

7.3 Management Approach

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

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

Contractors: The contractors will implement the majority of environmental and social 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.

7.4 Environment Management Plan for Construction Phase:

It lists all the mitigation measures identified in the EIA 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 7.1 environment Plan (EM)

Environmental and social aspect	Measures	Responsibility
Procurement & Setting up of Crushers, Hot-mix plants, other Vehicles, Equipment and Machinery	➢ Specifications of crushers, hot mix plants and batching plants, other Construction Vehicles, Equipment and Machinery to be procured should comply to the relevant Standards/ norms and with the requirements of the relevant current emission control legislations ➢ Hot mix plants, crushers and batching plants shall be located at distance ➢ Pollution control measures for Diesel Generator (DG) set i.e. stack height, acoustic enclosure etc. ➢ Adequate stack height and emission control devices such as bag house filters, cyclone separators, water scrubbers etc., should be attached ➢ Proper lighting arrangement shall be made around plant site if the plants are operated during dark hours. ➢ Provision of readily available first aid kit, fire fighting equipments at the plant site at appropriate location to respond in case of accident. ➢ Periodical monitoring of air quality and noise levels as per conditions stipulated under the statutory requirement. Whenever the emission exceeds the	Construction Contractor

	permissible level the plants should be stopped and necessary repairing works of faults should be done to bring down the emission levels.	
Setting up of construction/ labor camps	➢ The construction camps should be at least adequate distance from other site work to avoid conflicts and stress over the infrastructure facilities with the local community. ➢ Store house for hazardous material like diesel should be at distance from construction labor camps. ➢ The living accommodation n and ancillary facilities for labor shall be erected and maintained to standards and scales approved by the resident engineer. ➢ All sites used for camps will be adequately drained. They will not be subject to periodic flooding, nor located within 300 feet of pools, sink holes or other surface collections of water unless such water surface can be subjected to mosquito control measures. ➢ Construction camps should be electrified and well ventilated. ➢ No electrical wire should be left on the floor of camp or site. ➢ Proper system should be developed and entry to the site of electricity meter should be restricted and should be allowed for authorized personnel only	Construction contractor

	➢ Sanitary bathrooms shall be under cover and so partitioned off as to secure privacy, and shall have a proper door and fastenings ➢ Adequate and suitable facilities for washing clothes and utensils shall be provided and maintained for the use of contract labor employed therein. ➢ The sewage system for the camp will be properly designed, built and operated so that no health hazard occurs and no pollution to the air, ground or adjacent watercourses ➢ Clean potable drinking water facility should be provided at the site and the water quality should be monitored. ➢ First aid facilities should be made available at construction camp. First aid box should contain small, medium and large sized sterilized dressings, sterilized burns dressings. ➢ 1 first aid box should be available per 50 labors. ➢ A person trained in first-aid treatment shall be made in charge who shall always be readily available during the working hours at the work place. ➢ A suitable motor four wheeler transport shall be kept readily available to carry injured or ill person to the nearest hospital.	

Material sources	➢ Adequate safety precautions shall be ensured during transportation of quarry material from quarries to the construction site. ➢ Vehicles transporting the material shall be covered to prevent spillage.	Construction Contractor
Disposal of Debris	➢ Waste from construction camp should be segregated at site. Food/wet waste should be composted in pit at the site, recyclable should be send to authorized recyclers and rejected waste should be disposed regularly through responsible agency in the area ➢ Dustbins should be provided at the site and construction camps to prevent littering of waste. ➢ Storage area of minimum 2 days should be provided at construction camp for storage of the waste generated from labor camps ➢ All arrangement for transportation during construction including provision, maintenance, dismantling and clearing debris, where necessary will be considered incidental. ➢ Construction debris should be stored under covered sheds on paved surfaces to prevent leaching ➢ Any hazardous waste generated during construction activity shall be stored at suitable place and then disposed off in	Construction contractor

	consultation with the guidelines. ➢ Rubbish, debris and wastes remaining after blacktop works shall be cleaned and disposed off in a safe place. ➢ Utmost care shall be taken to ensure that the Municipal Corporation norms are met for the safe collection, transport and disposal of construction waste and debris.	
Construction Noise control plan/ Noise from Vehicles, Plants and Equipment	➢ 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. ➢ All vehicles and equipment used in construction will be fitted with exhaust silencers. ➢ Noise standard at processing sites, eg. hot mix plant , machinery will be strictly monitored to prevent exceeding of noise standards. ➢ Workers in vicinity of loud noise, shall wear earplugs and working time should be limited as a safety measure. Job rotations should also be carried out to prevent continuous exposure. ➢ Construction activities to be taken up during day time only.	Administration/ construction Contractor

	➢ Servicing of all construction vehicles and machinery should be done for exhaust silences and should be checked and if found defective should be replaced. ➢ No noisy construction activities should be permitted around educational institutions/ health centers (silence zones) up to a distance of 100 m from the sensitive receptors. ➢ Monitoring shall be carried out at the construction sites. ➢ Environmental Expert will be required to inspect regularly to ensure the compliance of EMP.	
Dust emission control	➢ During proposed project work of Proposed project is an Indus Valley Industrial Junction Special Economic Zone at Rajanpur involving construction, Water will be sprinkled on all the exposed sites to suppress the emission of dust ➢ Routes for transportation of material within the site should be covered with brick bed so as to minimize the dust generation ➢ Inventory of the material entering and going outside the site should be maintained at site. This will help in knowing the raw material available and prevent piling up of raw material and	Administration/ Construction contractor

	thus dust generation. ➢ Raw material stored should be covered. Debris and excavated soil should also be kept covered. ➢ Cement and sand should be stored under covered sheds only ➢ Vehicles delivering materials should be covered to reduce spills and dust blowing off the load. ➢ Compaction of prepared site to re-strain the fugitive emissions. ➢ Water should be sprayed in the cement and earth mixing sites as well as after compaction. ➢ In laying sub-base, water spraying is needed to aid compaction of the material. After the compaction, water spraying should be carried out at regular intervals to limit the dust to below. ➢ Every equipments and machinery will be fitted with dust suppression devices such as water sprinklers, dust bags, cyclone etc. as appropriate. ➢ Road surface should be cleaned with air compressor and vacuum cleaners prior to the construction works. Manual labor using brooms should be avoided, if used labor to be provided masks. ➢ The Contractor shall take every precaution to reduce the level of dust emission from the hot mix plants and the	

	batching plants. ➢ Contractor will ensure that all vehicles, equipment and machinery used for construction are regularly maintained and confirm that pollution emission levels comply with the relevant requirements. ➢ Air quality monitoring to be carried out during construction phase to check the pollutants level in the air	
Vehicle and equipment exhaust control	➢ All vehicles and other equipment used during the construction & installation will be tuned and maintained in good working condition in order to minimize the emission of pollution	Administration/ Construction Contractor
Water conservation plan	➢ Groundwater being extracted for construction activities of proposed construction project would be recorded, where possible, water would be recycled. ➢ Surface run-off due to construction activities should be collected & re-used for wheel washing & sprinkling for dust suppression. ➢ All raw material, excavated soil & debris to be kept covered so as they do not mix with rain water during rains and does not contaminate the rainfall run-off which may enter the nearby water reserves which will be used for construction	Administration
Drainage and	➢ The Contractor will always clear all the	

runoff	cross drainage structures and natural drainage before onset of monsoon in order to keep all drainage unblocked Earth, stones, wastes and spoils will be properly disposed off, to avoid blockage of any drainage channel. ➢ All necessary precautions will be taken to construct temporary or permanent devices to prevent inundation or pounding.	Construction Contractor
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
Loss or damage to vegetation	➢ At site, there is no flora even herbs and sherbs so there is no factor of loss or damage of vegetation.	
Soil contamination	➢ Platform and oil and grease trap for collection of spillage from construction equipment vehicle maintenance platform will be appropriately provided at construction camp, servicing area and	Construction Contractor

	liquid fuel and lubes at storage areas. ➢ Proper management of waste from labor camps and construction site. ➢ Proper disposal of wastewater generated from labor camp and construction site ➢ 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.	
Soil Erosion and Sedimentation n control	➢ Contractor should plan the activities so that no naked / loose earth surface is left out before the onset of monsoon. ➢ Top soil from debris disposal sites & along the road side should be stripped and kept under covered shed for plantation. ➢ After the construction activity is over, top soil will be utilized for landscaping activity. ➢ To avoid soil compaction along the transportation routes, only identified haul roads would be used for transportation.	
Socio-Economic Environment/ accidents	➢ Safety officer should be appointed at site to ensure all the safety guidelines are being followed at site ➢ Cautionary guidance should be provided	Construction Contractor

	at site to aware people about the associated risk with the area. Entry to the fuel storage room or machinery operation room should be restricted only to authorized trainer personnel. ➢ All Accidents shall be reported immediately and incident analysis, preventive measures shall be implemented. ➢ A gate should be provided at site and record for entry & exit of vehicles should be maintained at the site. ➢ Fuel should be stores at site away from construction camps. ➢ Adequate lightning should be provided at site especially during night time	
Occupational Health & Safety/ Construction Safety	➢ All construction worker should wear a safety jacket and other protective equipment like helmet, gloves, gum boots, ear plugs, mask while working at the site. ➢ All workers employed on mixing asphaltic material, cement, concrete etc., will be provided with protective footwear and protective goggles. ➢ Workers, who are engaged in welding works, would be provided with welder's protective eye-shields. Stonebreakers will be provided with protective goggles and clothing and will be seated at sufficiently safe intervals.	Construction Contractor

	➢ Workers should be made aware about the health issues related with open defecation ➢ Training to workers should be provided for handling the construction equipment and machinery. ➢ Training to the workers should be provided to handle the emergency situations like fire etc. ➢ First aid facility and sufficient nos. of trained personnel should be available at all the time at construction camp ➢ Cautionary signage and notice should be displayed in local language and English at the required places like fuel storage area so that hazards can be avoided. A security guard should be deputed in these areas and entry should be restricted. ➢ A register of all toxic chemicals delivered to the site shall be kept and maintained up to date. The register shall include the trade name, physical properties and characteristics, chemical ingredients, health and safety hazard information, safe handling and storage procedures, and emergency and first aid procedures for the product.	
Disaster Management	➢ All reasonable precaution should be taken to prevent danger of the workers and the public from fire, etc.	

	➢ Fire-fighting facility, i.e. sand filled buckets and portable fire extinguishers should be available at site. ➢ Workers should be trained how to use fie extinguisher. ➢ No construction activity should be taken during rainy season	
Clearing of Construction of Camps & Restoration	➢ Contractors shall prepare site restoration plans. The plans shall be implemented prior to demobilization. ➢ On completion of works, all temporary structures shall be cleared, all rubbish burnt, excreta or other disposal pits or trenches filled in and sealed and the site left clean and tidy.	Construction Contractor

7.5 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 7.2: 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 commencement of the construction		Revised monitoring plan
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 EIA/EMP	Carry out the corrective actions	Corrective action record
Maintenance of record	Maintain monitoring data and record of all incidents of environmental significance	Maintain monitoring data and record of all incidents of environmental significance	Environmental data base

Table 7.3: Environmental Monitoring with Frequency

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 in the 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 activity	Visual inspection	Construction on and operational site	Once daily	Environment Officer/ Manager
Water and other resources	To determine the effectiveness	Leakages, spillages and	Visual inspection and record tracking	At all points of use	On monthly basis	Environment Officer/ Manager

conservation	of the water conservation techniques in practice	wastages				
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	

7.6 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 7.4: Environmental Management Plan for Operation Phase

Aspects	Potential Impacts/Risks	Proposed Mitigation Measures	Responsibility
Changes in land value	Economic losses/gains	Minor positive	-
Seismic Hazard	Damage due to earth quake	Selection of a design for structure that must be safe against earthquakes	Project Contractor
Change of Land use	Proposed project is an Indus Valley Industrial Junction Special Economic Zone at Rajanpur will be developed on open plot having open area in the surrounding.	➢ The land of the proposed project is an open land which will keep the intact of its surrounding. The proposed project will not make any changes in the project site.	Project Contractor
Soil Quality	Soil quality can be changed if spill or industrial waste will not be handled properly	➢ All industries should use best technologies for optimal utilization of the raw material and re-use & recycling of waste material in the process to reduce waste generation as well as raw material demand for the ➢ All industries should be responsible for management of the solid and hazardous waste generated from their plots. Industries should be	

		liable to pay penalty in case of non compliance. ➢ It should be mandatory for all industries to provide storages for different category waste, its processing and safe disposal. ➢ Waste storage area should be paved surfaces and covered. ➢ No open area should be left without the vegetation to protect the soil.	
Traffic Movement	Movement of vehicles may result in traffic disruption if proper parking facilities are not provided.	➢ Adequate parking facilities will be provided for the tractor-trolleys to bringing the raw material in industries or carrying the products. ➢ The buses and bicycles should also have proper schedule and route. ➢ Timing will be fixed for heavy traffic.	Project Contractor
Additional load on Existing Utilities	Additional load on water supply, sewerage system, electricity ,telephone ,gas and solid waste system	➢ All the effects and mitigations of these utilities have already been covered in previous sections and no any problem will create due to load on existing facilities.	
Disposal of	Dumping of waste	➢ In the EZ, there is a specified	Project Contractor

Solid Waste	material in the surrounding area may limit use of land	area where all sort of waste will be kept from where solid waste management company will collect the waste.	
Air Quality/ gas emissions	Gases will be emit during industrial activities which may cause the pollution around the project site	➢ Plantation will be provided which will generate fresh oxygen; ➢ An air quality monitoring and improvement plan will be developed to keep the air pollution levels from generators etc. within the limits of Punjab Environmental Quality Standards (PEQS); ➢ Level of air pollution (as specified in the PEQS) will be monitored on regular basis; and vehicles with excessive smoke emissions will not be allowed to enter. ➢ The gases might be produced during the running of machinery will of air pollution control devices like Electro-static precipitator, bag filters, separators, cyclones, multi-level condensers & evaporators, scrubbers etc as per guidelines. ➢ Disposal of the waste material at the designated site for	Project Contractor

		waste disposal in covered condition. ➢ All the roads within the plot should be paved & water sprinkling should be practiced to minimize dust generation. ➢ Adequate stack height should be provided for dispersion of the emissions ➢ Chemicals having potential to release VOCs should be stored, handled and used in closed system ➢ Quarterly monitoring should be carried out for testing ambient air quality ➢ Development of thick green belt of 10 m all along the industrial plot periphery.	
Noise and Vibration	Noise pollution due to increased machinery operation	➢ Selection of up-to-date equipment and machinery with reduced noise levels ensured by suitable in-built damping techniques; Regular checkups and maintenance of the construction equipment; and use of appropriate muffling devices. ➢ Usage of machineries of modern make and adoption of latest available technology	Project Contractor

		which compiles to noise levels standards. ➢ Provision of personal protective equipment to workers exposed to noisy operations. Audiometric tests should be carried out for workers exposed to high noise levels. Job rotation should be practiced to prevent continual exposure. ➢ Noise levels in industries should be monitored regularly using noise meters. ➢ Minimal usage of horns within industrial plot. Specification of speed limits on roads. ➢ Regular maintenance of vehicles & construction machinery involved in industrial operation. ➢ Noisy operation should be taken up in covered conditions so that no disturbance due to noise is caused ➢ Thick green belt should be developed within each industrial plot that will act as noise barrier.	

Flora/Ecology	Construction will involve cutting of bushes	➢ Plantation of four saplings will be done in place of each uprooted tree to make project area environment friendly. ➢ Green belt of 10 m thickness should be developed all along the periphery of the industrial plot ➢ Native plant species requiring should be considered for plantation	Project Contractor
Fauna	There is no wildlife present in the Project area. Also, the local animals and bird species of the area are very much domesticated	No Impact	
Relocation of Utilities	No relocation of any public utilities is involved	No Impact	
Traffic Management	Disturbance to routine traffic moving on the Road	➢ The loaded vehicles will be there at project site in working hours in curtain time period which will not affect the traffic of the root. Moreover, area is already SEZ where traffic managed traffic is observed.	Project Contractor
Poverty Alleviation	Proposed project is SEZ will generate the employment	Minor positive	-

	opportunities to the population living in the surrounding areas.		
Workers' Safety and Hygienic conditions	Health risks in case of unsafe and/or unfavorable work conditions	➢ Enforcement of work safety measures such as wearing safety goggles, protective masks and boots and fixing of cautionary signs at designated sites during the operational phase of the proposed project which is SEZ, First aid box and emergency relief will be provided at the project to meet the emergency needs.	Project Contractor
Emergency Response	There are always chances of earthquakes and manmade disasters, fire, road accidents etc.	➢ An Emergency Response Plan for earthquakes and manmade disasters will be developed by the Management. Emergency Response Plan.	Administration
Water Pollution & water Conservation	Water pollution and water conservation can be great issue if it will not be handled properly.	➢ Provision of ETP & STP for treatment of sewage and industrial effluent. ➢ Separation of the effluent streams depending on the nature of pollutants ➢ Monitoring the quality of sewage, treated water, drinking water quality and ground water quality regularly ➢ Tank alarms should be installed so as to prevent idle	

		running of pumps ➢ Provision of oil & grease traps with the storm water drains draining the parking and fuel storage area. ➢ Leakage detection system should be provided and the water supply system should be regularly inspected to detect leakages. ➢ No hazardous waste, municipal waste, industrial waste should be disposed off in the water bodies or in ground. ➢ Leachates, if any or untreated sewage should be stored only in lined ponds to prevent contamination of ground water.	
Disaster and Risk Management	Risks are everywhere in SEZ from development to operational phase stage, if roper SOPs will not be followed then risk cannot be controlled	➢ Provision of first aid kits at the site ➢ Tie-ups with local hospital should be made to handling emergency case, if any ➢ Regular medical check-ups of the employees ➢ Training should be given to workers for handling the equipment and managing emergency situations	

		➢ Material safety data sheets of chemicals to be used should be displayed on local languages at work station ➢ Provision of personal protective equipment to the workers as per requirement ➢ Cautionary signage should be provided in the areas associated with risks like storage of chemicals, explosives, fuels etc. Entry for only trained authorized personnel should be allowed in such areas with adequate safety measures	
Socio-economy and aesthetics	Emergence of new employment opportunities for the local people	➢ Providing employment to local people preferably ➢ Adoption of all proposed air, noise, soil and water quality measures	-

7.7 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 matter either it can be domestic, industrial or commercial 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.

7.8 Changes-Record Register

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

7.9 Environmental Training

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

Table 7.5: 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

7.10 Monitoring Plan

The objective of environmental monitoring during the construction and operation phases is to compare the monitored data against the baseline condition collected during the study period to assess the effectiveness of the mitigation measures and the protection of the ambient environment based on national standards. A monitoring schedule has been sketched based on the environmental components that may be affected during the construction and operation of the project. 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 7.6: Environment Monitoring with frequency

Potential activity and potential impact	Objective of monitoring	Parameter to be monitored	Measurement	Location	Frequency	responsibility
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	Environment Officer
Emission of exhaust	To determine the	Source Emission	PM and CO	Generator	Monthly	Environment Officer/Mana

gases and particulates which may pollute the environment	effectiveness of the air pollutants' abatement devices on the concentration of the likely pollutants	parameter		Exhaust		ger
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	Administration Officer
Safety	To check and evaluate the effectiveness of the workers' safety plan and availability	Injuries	Injuries will be recorded	Entire SEZ	Daily	HSE

	and access of first aid facilities					

7.11 Environment Enhancement Measures & Environmental Budget

In order to enhance the environment, the following measures will be adopted:

1. Trees will be planted within the premises to beauty the surrounding area.
2. A special budget will be designated for the environmental improvement of the environment on annual basis. The administration will be responsible for spending of this budget. The team leader will prepare the inventory of environmental improvement activities and communicate it with the rest of the team for implementation.

Table 7.7: Cost Breakup Structure for Environment

Sr. #	Items	Cost
1	Tree Plantation around the project site	100,000/-
2	Environmental Monitoring	600,000/-
3	Environment awareness programs	400,000/-
Total 2,000,000/- (2 Million)		

7.12 ORGANIZATIONAL STRUCTURE & RESPONSIBILITIES

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

- **Primary Responsibilities:**

  The primary responsibility for implementing EMP within the SEZ is of proponent.

- **Operational Management and Control**

Conducting the operational activities in the environmentally sound manner will be the responsibility of the concerned Manager.

- **Supervision and Monitoring**

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

7.13 Compensation in Money Terms

The project lies in the open area where no structure will move on for sake of project. There will be no any resource which will be demolished. Thus there is no need for such exercise where money would be compensated.

No families are being affected and displaced due to development of EZ & off-site facilities at present. Thus no compensation is required to be given to any person. If any, land is required to be acquired in future then it should be done as per the law of land and resettlement action plan should be developed for that. Compensation should be given to affected people as per legal bindings.

7.14 Replacement, relocation and rehabilitation

The project lies in the open area where no structure or resource will be replaced. Thus there is no need to discuss the replacement, relocation or rehabilitation. Because there is no any stuff will be removed.

7.15 Equipment Maintenance Details

The equipments will be check on daily basis before start the work. All equipment will be well maintained and good in condition for getting the appropriate work in project.

7.16 Contingency Plan

In order to be in a state of readiness to face adverse effects of accidents, a Contingency Plan is required to be prepared which includes on-site and off-site emergency plan by the

individual industry, industrial estate and all blocks of this economic zone. IVI Junction Special Economic Zone is committed to develop a Contingency Plan in consultation with district authorities and industry association.

The Contingency Plan will have the following minimal components:

- Accidents preventions procedures/ measures
- Fire prevention planning and measures
- Fire water storage and foam system
- Accident/emergency response planning procedure
- Communication
- Emergency control centre
- Emergency information system with role & responsibility and command structure
- Recovery procedure
- Assessment of damages and rectification
- Evaluation of functioning of disaster management plan
- Accident investigation
- Clean-up and restoration

7.17 Monitoring Indicators

The physical, biological and social components which are of particular significance to the proposed project are listed below:

- Air quality
- Water quality
- Noise levels
- Solid & Hazardous Waste Management
- Re-plantation success / survival rate
- Soil Erosion

These indicators will evaluated periodically based on the monitoring results, baseline conditions, predicted impacts and mitigation measures.

7.18 Environment Management Cost

Environment management cost includes the cost of mitigation measures as proposed under impact identification chapter. Most of the costs are part of construction costs. Detailed cost breakup for the project is given below in the table below;

Table 7.8: EMP with Cost

Sr. #	Environment Management Measure	Capital Cost	Recurring Cost	Responsible Institution
Construction Phase				
1	Provision of Personal protective Equipment to all labor involved in construction of proposed off-site developments	Included in construction cost	Included in construction cost	Contractor and management of Industrial Valley Industrial Junction Economic Zone at Rajanpur
2	Construction of Labor camps	Included in construction cost	Included in construction cost	Contractor and management of Industrial Valley Industrial Junction Economic Zone at Rajanpur
3	Construction of Toilets & Septic Tanks/Soak Pits	Included in construction cost	Included in construction cost	Contractor and management of Industrial Valley Industrial Junction Economic Zone at Rajanpur
4	Construction of Temporary storm water drainage system	Included in construction cost	Included in construction cost	Contractor and management of Industrial Valley Industrial Junction Economic Zone at Rajanpur
5	Construction waste management and disposal	Included in construction cost	Included in construction cost	Contractor and management of

				Industrial Valley Industrial Junction Economic Zone at Rajanpur
6	Provision of clean drinking water supply	Included in construction cost	Included in construction cost	Contractor and management of Industrial Valley Industrial Junction Economic Zone at Rajanpur
7	Water sprinkling	Included in construction cost	Included in construction cost	Contractor and management of Industrial Valley - Industrial Junction Economic Zone at Rajanpur
8	Environmental monitoring ➢ Air quality ➢ Noise level ➢ Drinking water quality	-	5 million annually	Contractor and management of Industrial Valley Industrial Junction Economic Zone at Rajanpur
9	Safety & Quality inspections	Included in construction cost	Included in construction cost	Contractor and management of Industrial Valley Industrial Junction Economic Zone at Rajanpur
10	Environmental Training	-	3 million annually	Contractor and management of Industrial Valley

				Industrial Junction Economic Zone at Rajanpur
Operation Phase				
1	Environmental monitoring ➢ Air quality ➢ Noise level ➢ Ground Water Quality at Nearby Villages ➢ Ground Water level at 4 locations (withdrawing stations & nearby area)	-	7 million annually	Management of Industrial Valley Industrial Junction Economic Zone at Rajanpur

Significant impacts and factors to be determined

The impacts usually considered for the project are as following;

1. If proposed project is going to be construct then it's before and after feasibility check
2. The environmental issues prior and after would be considered
3. The social and economic effects before and after the project are considered
4. The infrastructure of project is considered, its impacts would be considered before and after on the land, resources and ecosystem
5. The significant impacts and factors are determined and calculated according to the temporal and spatial frame and project is considered best if all the conditions are within the limit and ecosystem, environment, public and economy are save.

Impact assessment

Impact Assessment is a methodology used for examining 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.

1. Methodologies for impact identification (one/more)

The main EIA techniques used in scoping are baseline studies and checklists. These techniques collect and present knowledge and information in a straightforward way so that logical decisions can be made about which impacts are most significant. The baseline study has been discussed in detail in Chapter 4 while checklist or questionnaires were conducted for view of public. Keeping in view, all the findings of the baseline study, and through general observation and desktop study, and understanding of the activities and processes involved in the project, environmental impacts have been anticipated. Following impact assessment methodology; i.e. defining the criteria for evaluation of the impacts, identification of mitigation measures (all possible options), evaluation of the residual impacts and identification of the monitoring requirements, adequate and effective mitigation measures have been proposed for all construction and operation related likely environmental impacts of the project. After impact assessment, these

mitigation measures have been proposed in order of attempts to eliminate or minimize the impact.

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. 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 impact assessment usually done on the difference criteria like prior and later on impacts;

1. Environment issues prior the commencement and after operation of the project
2. Environmental monitoring prior the commencement and after operation of the project
3. Social issues prior the commencement and after operation of the project
4. Ecosystem impacts prior the commencement and after operation of the project
5. Impacts on resources like water, energy etc. prior the commencement and after operation of the project

Methods Used for Impact Analysis

- Scoping or checklists.
  - Qualitative analysis; developing focus groups
  - Quantitative analysis
  - Identifying and describing alternatives for example cost-benefit analysis
  - Data gathering by questionnaires consultations and surveys
  - Data presentation
  - Monitoring and evaluation

In this case questionnaires were conducted and data was collected for the said project. The data showed there was no impact in regard of air pollution, water pollution or noise

pollution. The questionnaire in surrounding for SEZ also showed the reviews of people that they are happy to see the project here which will generate the jobs for locals.

Characteristics of impacts

1. **Nature:**

   The nature of impacts will be social, on ecosystem, on environment, on natural resources like water, energy etc. The nature of impacts will be collective like domestic, industrial and commercial as said project is an Economic Zone. The nature of impacts will be within the limits set by EPA, Punjab. The impacts have been calculated before commencement of the project and they will be mitigated according to the protocols set by EPA, Punjab.

2. **Magnitude:**

   Magnitude of project is limited within the limit set by EPA, Punjab. The commercial, domestic and industrial activities will be according to the latest technologies having 99% efficiency, energy consumption very low and pollution factor is very low.

3. **Extent and Location**

   The project is economic zone and its extent and location is limited as mentioned in layout plan as well as in property documents.

4. **Timing/ duration**

   The timing for construction activities will be might be one year but industrial activities and project will take time as after completion of project, the proponents will purchase the land for industrial and commercial activities. Thus timing varies in this regard.

5. **Reversibility and Risk**

The reversibility of the project is nil because project parameters have been analyzed before commencement of the project and after construction all protocols and mitigation will be adopted. Thus reversibility and risk factor is negligible. The reversibility is negligible in this project as resources utilization is not come back however, sustainability can be. The risk is also negligible as project is simple in process as spinning unit.

The general approach to determine the characteristics of impacts is 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). Site specific and practically suitable mitigation measures are recommended to mitigate the impacts.

Proposed monitoring program to assess performance or output of EMP

Sr. #	Positions	Significance	Stage	Environmental Responsibilities
1	Proponent / Owner	Critical	Construction / Operations	• Oversee Environmental Policy and EMMP • Serve as primary contact to the regulatory authorities • Commit resources to achieve environmental objectives
2	All Employees	Critical	Construction / Operation	• Attend training and understand their roles in the implementation of EMMP • Understand the Environmental Policy / Objectives and act accordingly • Participate in the review of EMMP • Coordinate with the responsible authorities within the project to report any noncompliance to their Environmental Policy
3	Construction Supervisor	Critical	Construction	• Understand the environmental policy of the project • Operate in accordance with the environmental policy • Ensure reducing solid waste generation • Reduce water and energy wastage

				• Ensure all machineries /equipment are in good conditions • Ensure health and safety of the workers during construction phase
4	Maintenance Manager	Critical	Construction / Operation	• Understand the environmental policy of the project • Operate in accordance with the environmental policy • Ensure reducing the chances of increased solid waste • Reduce water and energy wastage • Ensure health and safety of the workers during construction / operational phase • Provides health, safety and environmental awareness trainings to the staff
5	Administrative Person Deal with Environment Issues	Critical	Operational	• Understand the environmental policy of the project • Operate in accordance with the environmental policy • Ensure reducing the chances of increased solid waste • Reduce water and energy wastage • Ensure all machineries /equipment are in good conditions • Ensure health and safety of workers during operational phase • Receive health, safety and environmental awareness trainings • Prepare and maintain

				accidents/environmental risk records • Timely coordination with the responsible authority

Potential environmental enhancement measures

In order to enhance the environment the following measures will be adopted:

3. Trees will be planted within the premises to beauty the surrounding area.
4. A special budget will be designated for the environmental improvement of the environment on annual basis probably 2 million. The administration will be responsible for spending of this budget. The team leader will prepare the inventory of environmental improvement activities and communicate it with the rest of the team for implementation.

CHAPTER VIII
RECOMMENDATIONS AND CONCLUSIONS

8.0 RECOMMENDATIONS

The Environmental Impact Assessment study and survey results are finally evaluated to recommend the following terms. The present EIA Report of "Proposed project that is Indus-Valley Industrial Junction Special Economic Zone at Village Suri, Sub Tehsil Shahwali, Tehsil Rojhan, District Rajanpur, Punjab meets the administrative and legal framework of the EPA Punjab.

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

8.1 Conclusion:

In view of the above it has been concluded that proposed project that is Indus-Valley Industrial Junction Special Economic Zone at Village Suri, Sub Tehsil Shahwali, Tehsil Rojhan, District Rajanpur, Punjab is environmentally friendly with sustainable design and has no adverse effects on environment. It is therefore requested to issue the environmental approval under section 12 of PEPA 1997 (Amended 2012) for the operation of the project.

8.2 Recommendation:

The Environmental Impact Assessment (EIA) study and survey results are finally evaluated to recommend the followings:

- The present EIA Report of "Proposed project that is an Indus-Valley Industrial Junction Special Economic Zone at Village Suri, Sub Tehsil Shahwali, Tehsil Rojhan, District Rajanpur, Punjab meets the administrative and legal framework of the EPA Punjab.
- Implementation of EMP must be given top priority.