

**ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT**

**MINING LEASE FOR COAL BY**

**M/S GHULAM MUHAMMAD TIWANA**



**Situated at Near Kalial, District Khushab**

**PROPONENT:**

**Mr. Malik Ghulam Muhammad Tiwana**

**CONSULTANTS:**



**ECOSPHERON ENVIRONMENTAL SERVICES**

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## EXECUTIVE SUMMARY

### INTRODUCTION

This executive summary presents an overview of the main findings of the Environmental Impact Assessment (EIA) report for “**Mining Lease For Coal By M/S Ghulam Muhammad Tiwana**” situated at near **Kalial, District Khushab**. As a prerequisite to proceed with the mining activities, it is essential to conduct a thorough environmental assessment to identify the potential and actual threats associated with subsequent mining activities on the environmental settings as well as the socio-economic fabric of the area. 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 project site granted licensing authority to renew the mining lease for further period of five years. In this regard proponent needs environmental approval for further work on lease.

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.	<b>Project title</b>	<b>Mining Lease For Coal By M/S Ghulam Muhammad Tiwana</b>
2.	<b>Location</b>	<b>Near Kalial, District Khushab</b>
3.	<b>District</b>	<b>Khushab</b>
4.	<b>Name of Proponent</b>	<b>Mr. Malik Ghulam Muhammad Tiwana S/o Malik Muhammad Ali Khan Tiwana (Chief Executive)</b>
5.	<b>Address</b>	<b>R/O I-A Civil Line Jauhrabad, District Khushab</b>



6.	Area of the project	1000 Acres		
7.	Type and category of project	Schedule II (EIA) – Mining and processing of coal, gold, copper, Sulphur, precious stones and other raw materials Section C Mining and Mineral Processing		
8.	Nature of the Project	The proponent need environmental approval as Mines and Mineral Department granted licensing for the coal mining lease for five years.		
10.	Availability of resources	Transportation, water supplies, net connection, electricity etc. are available. Mean necessities for life are available.		
11.	Source of electricity	Generator is available at project site		
12.	Manpower requirement	10-15 workers will be available at project site		
13.	Water requirement	Only for drinking water is required. Water requirement during operational hours is estimated at 300 to 350 liters per day.		
14.	Solid waste and its management	Solid waste is estimated some sort of coal only during mining activity.		
15.	Wastewater and its treatment in proposed project	Wastewater is not estimated during mining because water is not needed for process.		
16.	Type of coal	At project site, Bituminous type coal is excavated.		
17.	Period of mining lease	05 Years		
18.	Project Coordinates	Points	Easting's (Yds)	Northing's(Yds)
		A	3439000	1012112.8
		B	3442498.12	1014930.74
		C	3442440	1015000
		D	3439230	1015000



**Environmental Consultants:**

An Initial Environmental Examination (IEE) 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 # 7, F-2, 9 Kashmir Block, Jalal Center, Allama Iqbal Town, Lahore.

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**Email Address:** [ecosphiron@gmail.com](mailto:ecosphiron@gmail.com)

<b>Names</b>	<b>Designation</b>	<b>Roles and responsibilities</b>
Ms. Shakeela Rani	Manager (Environmental & legal)	Technical Support.
Mr. Manzoor Ahmad	Manager (operation)	Baseline study/ Report preparation
Mr. Ahmed	Assistant Manager Operation	Logistic and report preparation
Mr. Ali Raza	Field Coordinator	Assist for Baseline Study

**A Brief Outline of Project:**

Respective project is a coal mining lease and proponent has been granted licensing authority coal lease for next five years. In this regard proponent need environmental approval and about to apply for mining while working in context of environmental safeguards.

The proponent seeks environmental approval so that every activity could be done in environmental friendly conditions. The site area is 1000 Acres and staff will be 10-15 and there is only drinking water will be needed. The energy requirement will be fulfilled by generator if needed.



### **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. 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.

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  
(Environmentalist)

\_\_\_\_\_  
Mr. Manzoor Ahmad  
(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. Malik Ghulam Muhammad Tiwana  
(Proponent)  
Mining Lease for Coal by M/S Ghulam Muhammad Tiwana, Khushab



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## CHAPTER I

### INTRODUCTION

#### 1.0 Purpose

**“Mining Lease for Coal by M/S Ghulam Muhammad Tiwana” is situated at near Kalial, District Khushab.** 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 2022 and the guidelines drafted for IEE and EIA under numerous sectorial heads. The entire set of legislative framework requires any new development project to undergo an IEE or EIA based on the categorization of the project under Schedule I and/or Schedule II.

#### 1.1 Identification of the Proponent Contact Person

Mr. Malik Ghulam Muhammad Tiwana S/O Malik Muhammad Ali Khan Tiwana  
(Chief Executive)

##### **Address of the Proponent:**

I-A Civil Line Jauhrabad, District Khushab

##### **Identification of the Project:**

“Mining Lease for Coal by M/S Ghulam Muhammad Tiwana” is situated at near Kalial, District Khushab.

#### 1.2 Environmental Consultants:

The Initial 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. The consulting team can be approached through the following contact details:



Ecosphiron Environmental Services

Office # 7, F-2, 9 Kashmir Block, Jalal Center, Allama Iqbal Town, Lahore

Contact No. 0301 4276787, 0322-4908520, [ecosphiron@gmail.com](mailto:ecosphiron@gmail.com)

<b>Names</b>	<b>Designation</b>	<b>Roles and responsibilities</b>
Ms. Shakeela Rani	Manager Environmental legal	Technical Support.
Mr. Manzoor Ahmed	Manager operation	Baseline study/ Report preparation
Mr. Ahmed	Assistant Manager Op.	Logistic and report preparation
Mr. Ali Raza	Field Coordinator	Assist for Baseline Study

### **1.3 Nature and Size of Project**

The project “Mining Lease for Coal by M/S Ghulam Muhammad Tiwana” is situated at near Kalial, District Khushab. 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 proposed project is 1000 Acres.

A total of 10-15 people will work on the project during mining. This is further explained under Environmental Impacts and Mitigation Measures for the project.

The whole project will require about 300-350 liters/day of water at project site for drinking etc. Water tank will be available at the project site. The mining will be started now after getting environmental approval.

No hazardous waste will be generated at the site. Only small quantity of waste is generated which is due to domestic practices.

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.

#### 1.5 Location

The project is “Mining Lease for Coal by M/S Ghulam Muhammad Tiwana” is situated at near Kalial, District Khushab.

##### **The project site is surrounded by:**

East: Lease Area

West: Lease Area

North: Main Road

South: Lease Area

The project site is located in the lease area where mining activities already exercising. The project is in ideal location where no sensitive area or biodiversity is present.

#### 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 2022, issued by Pakistan Environmental Protection Agency (Pak EPA) and adopted by the EPA Punjab.

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

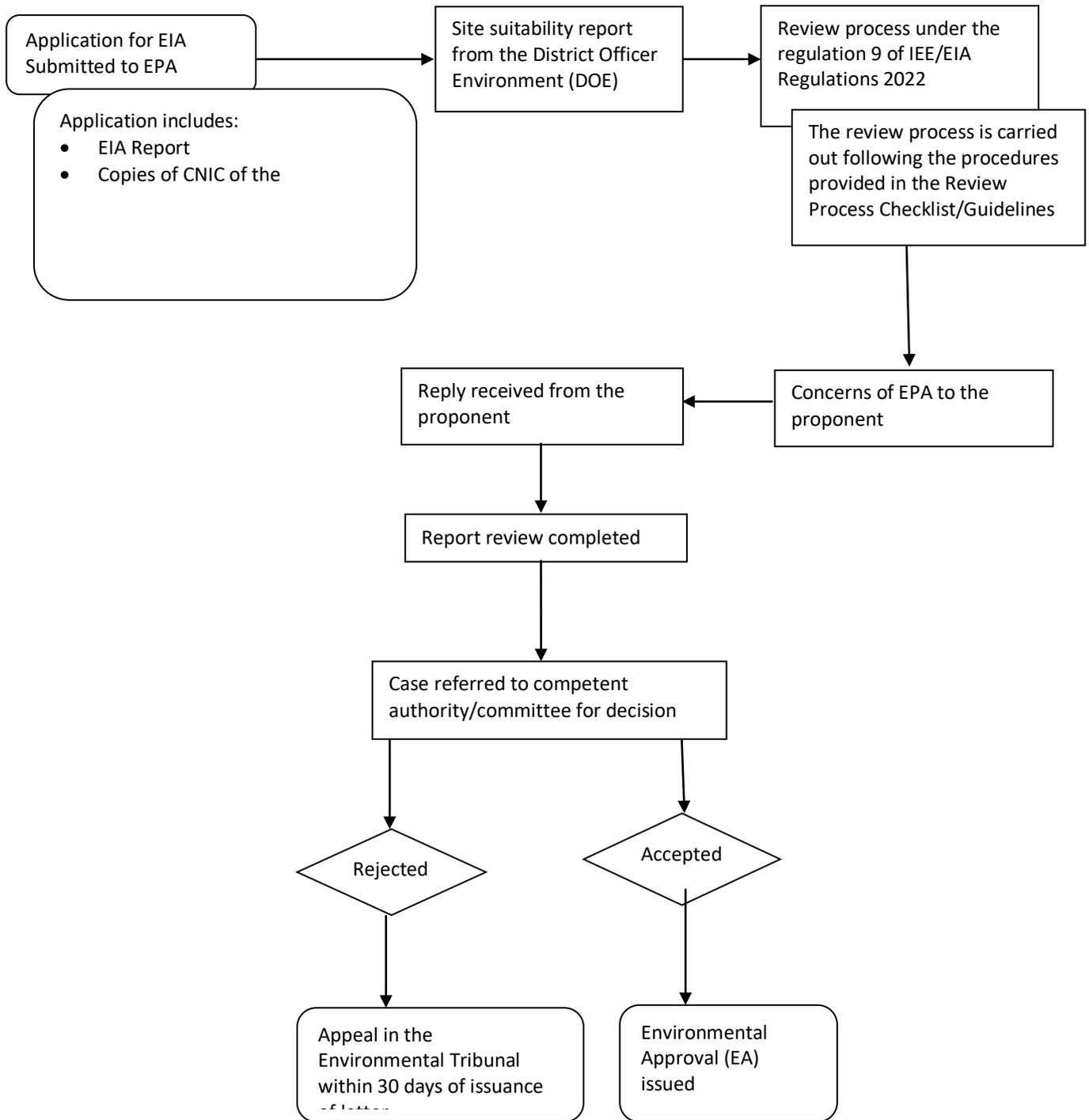


Fig 1.1: The EIA process flow chart



## 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 “Mining Lease For Coal By M/S Ghulam Muhammad Tiwana” is situated at near Kalial, District Khushab falls under the category of projects mentioned Schedule II (EIA) – Mining and processing of coal, gold, copper, Sulphur, precious stones and other raw materials section **C Mining and Mineral Processing** 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

- Promoting the safe production and use of coal and mineral resources

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.

#### 2.2 Alternatives Considered

##### 2.3 Alternatives Considerations

The economic growth in Pakistan has been exponential in the recent times. The growth in infrastructure development in the rural and urban areas of the country has been robust hence creating increased demand for resources that are required for such development,

- Alternative I – No Project (Mining Vs. Relying on Current Market Supply):** The first and foremost option discussed was need of project. Under this option it was argued if the Government of the Punjab actually needed to initiate mining activities to



fulfill the increased demand of coal. The option of “not initiating mining activities” was analyzed. However, this idea was rejected due to the fact that the current market supply of coal does not meet the increased demand in future. Had the Government of the Punjab not planned on initiated the proposed project, the gap in supply and demand of coal would have resulted in increased prices country wide hence, creating an economic burden on the people. The decision of planning to execute this project was based on the objective of discouraging the creation of a monopolistic market for coal in the country.

ii) **Alternate II-Site Alternatives**

Pakistan is endowed with extensive geological potential. The country possesses extensive reserves of mineral deposits such as coal copper, gold, limestone, sandstone etc. Our mineral resources are enormous and emerging as a promising country for exploration of mineral deposits. Based on available information, Pakistan’s more than 6,00,000 sq kms outcrop area demonstrates varied geological potential for metallic / non-metallic mineral deposits. Currently about 52 minerals are under exploration but on a small scale. The major production is of coal, rock salt, and other industrial and construction minerals. At present, the value addition in the mineral sector is mainly concentrated in five principal minerals, namely, limestone, coal, gypsum, sulphur, crude oil, and natural gas.

The site of coal mining has been selected after careful consideration of resource reserve. Other factors evaluated in finalizing the selected site were its distance from nearest population, water reservoirs, protected areas, forest, declared or potential sensitive areas. It is evident that the site is not located in close vicinity to any of the areas identified as potential victim.

iii) **Alternative III- Location Outside of City:**

The project lies among the lease area where mining activities are already going on. At the project site, there are already mining activities done in past but now after granting license of lease for further few years, proponent need environmental approval. The project is far away from the city in the lease area where in 10-12 km radius there is no population or sensitive zone. Infrastructure like basics for labor will be available at the project site, therefore selection of alternative III was considered most suitable.

iv) **Alternative IV-Sustainability Aspects/Availability of Minerals:** Though this alternative does not relate to identification of site, however, this is an equally



important alternative which has been considered by the management of Mining Lease For Coal By M/S Ghulam Muhammad Tiwana for the site. Sustainability in mining activities can only be achieved by ensuring reduction in inputs and reducing the outputs of mining activities. Reduction in input refers to the efforts made in reducing water and energy consumption, the proponent will ensure strict adherence to the Environmental Management and Monitoring Plan devised in this EIA report.

**2.3 Location Plan/Map**

Title of proposed project is “Mining Lease For Coal By M/S Ghulam Muhammad Tiwana” which will start mining after getting environmental approval from EPA, Punjab. The project is located near Kalia, District Khushab. The project is surrounded by lease area. Exact coordinates of the project are given in Table: 1

**Table 1: Project Co-ordinates**

Coordinates	Location Type
East	Lease area
West	Lease area
North	Main road
South	Lease area

**2.4 Land use on the site:**

The project site is about coal mining which is intended to start their project activities by getting environmental approval.

**2.5 Road Access:**

The project site is far from main Khushab road. The project surrounded by lease area located at near Kalia, District Khushab which is rest of cities.

**2.6 Vegetation features of the site:**

At present, most of the Project Area is consisted of some bushes and grass. The project area is lease on its right & left and back side of the project, while road is in front of the project site.

**2.7 Magnitude of the Operation and Associated Activities**

The proposed project intends on coal mining with named Mining Lease for Coal by M/S Ghulam Muhammad Tiwana with total area of 1000 Acres. The project is within



the lease area. It includes the planning work, site survey, geotechnical investigations, site clearing work, infrastructure work and mechanical works and activities of coal mining includes the followings:

- Demarcation of the Area for various facilities
- Infrastructure works (roads, water supply, sewerage etc.)
- Installation of lights

Coal mining will be started at site after getting approval. Meanwhile the proponent will be responsible for the monitoring of the site during whole mining period. So any adverse distresses should be removed or reduced at the level of PEQs.

## **2.5 Water Requirement**

Only for drinking water is required. Water requirement during operational hours is estimated at 300 to 350 liters per day.

## **2.6 Wastewater Generation and Disposal**

Wastewater is not estimated during mining because water is not needed for process

## **2.7 Solid Waste Generation and Disposal**

Solid waste is estimated some sort of coal only during mining activity.

## **2.8 Energy Demand**

The energy will be supplied by generators.

## **2.9 Manpower Required**

10-15 workers will be available at project site during coal mining. Thus the project is source of employment for economic development activities of the area.

## **2.10 Proposed Schedule of Implementation**

It is estimated that the project will start its work after getting environmental approval.

## **2.11 Details of Restoration and Rehabilitation Plan:**



### 2.11.1 Purpose and Scope:

The project lies among the lease area where there is no any sensitive zone or area and resource which will be demolished during coal mining. Thus there is no need for restoration and rehabilitation plan.

### 2.12 Government Approvals

Proponent is filling the EIA in Environmental Protection Agency, Punjab for approval.

### 2.13 Salient Features about Project related:

#### 2.13.1 Coal

Coal is a complex mixture of organic chemical substances. Chemical substances containing carbon, hydrogen and oxygen with smaller amounts of nitrogen and Sulphur. Coal is a fossil fuel and is the altered remains of prehistoric vegetation that originally accumulated in swamps and peat boggs. The energy we get from coal today comes from the energy that plants absorbed from the sun millions of years ago.

#### 2.13.2 Mode of Formation of Coal

Physical and chemical changes in the vegetation, transforming it into peat and then into coal. All living plants store solar energy through a process known as photosynthesis. When plants die, this energy is usually released as the plants decay. Under conditions favorable to coal formation, the decaying process is interrupted, preventing the release of the stored solar energy. The energy is locked into the coal. The chemical and physical properties of the plant remains were changed by geological action to create remain a solid material (coal).

#### 2.13.3 Environment for Coal Formation:

The wide shallow seas are the ideal conditions for coal formation. The ideal time of coal formation is Carboniferous period.

#### 2.13.4 Types of Coal:

Coal is classify into four following types

1. Lignite
2. Bituminous
3. Sub Bituminous
4. Anthracite



### **2.13.5 Existing Coal type in said Project:**

In the said project, Bituminous coal type is present which will be extracted by means of the mining after getting environmental approval.

### **2.13.6 Details of existing Bituminous coal:**

Bituminous coal has a high Sulfur content and thus is the Lowest Grade. Bituminous coal contains 45-86 percent carbon, and has two to three times the heating value of lignite. It is used in Steam electric power generation. In this case using fossil fuels such as coal, oil and natural gas to heat water to produce steam that turns a turbine to produce electricity.

#### **2.13.7 Coal Contains:**

- Moisture: 6.0 %
- Ash: 8.0 %
- Sulfur: 1.5 %
- BTU per lbs: 13,000
- Volatile Content: 25 %
- Size: 1-1/4" x 3/8" with maximum 6 % minus 3/8"

### **2.13.8 Bituminous Coal Reserves**

According to geological survey and their results, it has been estimated that bituminous reserves of this coal mine is around 861 million tons.

### **2.13.9 USES of Coal**

Important users of coal include alumina refineries, paper manufacturers, and the chemical and pharmaceutical industries. Several chemical products can be produced from the by-products of coal. Refined coal tar is used in the manufacture of chemicals, such as creosote oil, naphthalene, phenol, and benzene. Ammonia gas recovered from coke ovens is used to manufacture ammonia salts, nitric acid and agricultural fertilizers. Thousands of different products have coal or coal by-products as components: soap, aspirins, solvents, dyes, plastics and fibres, such as rayon and nylon

## **2.14 Details of Mine**

### **a) Total Lease Area of the project:**

The total area for coal mine is 1000 Acres.

### **b) State of Mine**

The coal mine was being used for mining and now after granting license from mines and mineral department for further mining, proponent needs environmental approval.



**c) Type of Mining**

The type of this coal mining is in the mine/underground mining.

**d) Method for this Mine Operation:**

By mechanized method, coal mine will be excavated.

**e) Mode of Entry into this coal mine:**

Surface mining method is adopted for this coal mine resource.

**2.15 Environmental and Social Impacts of specific concern Coal Mining project & their Mitigation**

**2.15.1. Background:** Historically, mining was executed with the main target towards the mining benefits and with little consideration towards the environment, local community or development. Nevertheless, the coal and mineral extraction has contributed the varying degrees of social footprints via environmental degradation, human health impacts, and social displacement, even beyond the physical boundaries of individual mining leases. Further, the in situ beneficiation and long distance transportation of minerals also significantly contribute to enhanced mining footprint over a geographically large area.

In recent years, the environmental and social impacts of mine operations in Pakistan have been of great concern. The remedial and mitigation measures are the responsibility of mine managers and environmentalists. It is very important to consider the social impacts of mining activities on the surrounding socio-economic environment, and affected individuals.

Generally, the environmental and social impacts are divided into waste management issues, impacts to biodiversity and habitat, indirect impacts, and poverty alleviation and wealth distribution .

**2.15.2 Environmental and Social Impacts:** Environmental impacts may be transient (often acute, associated with accidental discharges or explosions), temporary (only during operational activities) or chronic (long-term, arising from mineral extraction and waste disposal).

Major environmental impacts arising from mining activities include:

- Water accessibility and quality
- Air quality
- Land disturbance
- Waste generation



- Biodiversity loss
- Nuisance and disturbance

The social impacts are:

- Housing displacements
- Resettlement
- Employment
- Health and Safety
- Ecosystem services
- Socio political conflicts

Most of the social impacts are often the result of the environmental impacts. However, there are some synergistic and antagonistic factors which control the social impacts. These factors are summarized in Table 1.

Table 1: Factors controlling social impacts of mining

<u>Category</u>	<u>Site-specific factor</u>
Land	Nature of surface/terrain
	Ownership
	Adjacent land uses
	Other land use options, e.g., ecotourism
Water	Sensitivity to erosion, leaching and contamination
	Other uses of receiving water, e.g., drinking, washing, bathing, fishing
Air	Wind speed and direction
	Dispersal area and direction
Geology	Overburden depth and height
	Composition of overburden
Community	Proximity to extraction site
	Urbanization of rural areas
	Community involvement in mining operations
	Presence of local pressure groups
Biodiversity	Sensitive flora and fauna
	Fragile ecosystems in nearby areas

**2.15.3 Impacts of Mining on Soil Quality:** Erosion of exposed soils, extracted mineral ores, tailings, and fine material in waste rock piles can result in substantial sediment loading to surface waters and change in drainage pattern. In addition, spills and leaks of hazardous





materials and the deposition of contaminated windblown dust and water runoff and leaching can lead to soil contamination.

**2.15.4 Impacts on Water Resources:** The most critical impact of mining in most of the cases is on water quality and availability of water resources. The environmental impacts of tailings and acid mine drainage are the serious issues of concern. Acid mine drainage is one of the most prevalent factors and serious threats that affects the water through dissolved metals and contaminant leaching. Nevertheless, in other cases, leaching of toxic constituents, such as arsenic, selenium, and heavy metals, can also occur. Heap leaching and blasting operations also lead to elevated levels of cyanide and nitrogen compounds (ammonia, nitrate, nitrite) in water resources. The poor quality of water affected by mining is not only unsuitable for human consumption, but also has devastating effects on water bodies (rivers, lakes) and aquatic life. The surface water quality also negatively affects the terrestrial wildlife. In general, the impacts of contaminated water are divided into following categories:

- (i) Chemical: The impacts are due to altered pH resulting into increased acidity or alkalinity; increased dissolved metals and the presence of synthetic compounds.
- (ii) Physical: Physical impacts include the increased concentration of suspended solids causing turbidity, and adsorption of metal compounds onto sediments and soils.
- (iii) Biological: This impact is seen in the form of species migration and death and also acute chronic toxicity. Biological impacts also affect ecosystem health that includes: disturbed soil, vegetation and fauna; contaminated and polluted water and air.
- (iv) Ecological: Ecological impacts include habitat alteration, bioaccumulation of metals in food chain, species extinction and reduced primary productivity.

**2.15.5 Impacts on Air Quality:** Impacts of mining on air quality are observed during each stage of the mine cycle, but the mining operations like drilling, blasting, hauling, collection, and transportation are the major sources of airborne emissions and pollution. During mining cycle, the ore extraction, generation of solid waste and ore refining and processing, create air pollution which have cumulative environmental and public health impacts. These result into air and water pollution, reduced aesthetic values, blockage of pit access and filling of sump, and thereby problem of pumping leading towards flooding of the working area during rainy seasons. The mine waste spoils dumped over the ground contains small size of particles that are easily dispersible by the wind. The major sources of air pollution in mining operations are Particulate Matter (which is mostly dispersed by the wind during excavations, blasting, material transport, and also from tailings, waste dumps, and haul roads) and Gas Emissions



(These are mostly generated during the combustion of fuels, explosions and mineral processing).

**2.15.6 Impacts as Disturbance:** Noise and Vibration Noise pollution is one of the major impacts of mining activities, particularly from blasting, crushing, draglines, conveyors and process plants. Blasting operations affect their surroundings in the form of ground vibration, air blast, fumes etc. Vibration affects the stability of infrastructures, buildings, and residences of people living in and around the large-scale open-pit mining operations. The domesticated animals and wild fauna are also impacted. According to a study commissioned by the European Union in 2022, shocks and vibrations as a result of blasting in connection with mining can lead to noise, dust and collapse of structures in surrounding inhabited areas.

**2.15.7 Impacts of Mining Projects on Wildlife fauna:** Wildlife fauna includes the non-domesticated animals (or other organisms). Mining heavily impacts the wild fauna through the removal of vegetation and topsoil, ecosystem destruction, the release of pollutants, and the generation of noise. The major losses are in the form of:

Habitat Loss: Mining activities mainly disturb, remove or redistribute the land surface with some impacts being short-term and some long-term. During the excavation or mine spoil piling, the wild life species along with the sedentary species such as invertebrates, reptiles, burrowing rodents, and small mammals are destructed or displaced.

Habitat fragmentation: Habitat fragmentation is a serious ecological impact that occurs due to breaking of a large land area into smaller patches. It affects the migratory routes of the wildlife by making the dispersal of native species from one patch to the other difficult or impossible. The species requiring large forest patches mostly disappear due to habitat fragmentation.

**2.15.8 Impacts of Mining Projects on Social Values:** The major social impacts of mining could be seen in the form of demographic change (e.g., size and composition of resident population), economic change (new pattern of employment and income), environmental change (land use changes, loss of natural habitat and hydrological regime), lifestyle and cultural impacts and health impacts. The major impacts which affect the society are mainly the displacement and resettlement.

**Human Displacement and Resettlement** One of the most serious negative impacts of mining is the physical displacement of thousands of people for undertaking mining operations in their residence areas. This is a big challenge for human rights and poses enormous social risk. The displacement which forces entire communities to shift elsewhere is not only limited to



losing their homes, but also their land, and livelihoods. The resettlement of displaced communities is mostly in areas without adequate resources and areas close to mining operations full of pollution and contamination. In addition, the lack of adequate rehabilitation and resettlement policies, the migrants remain deprived of proper mechanisms to address their basic requirements to improve their livelihoods. The associated issues are access to clean drinking water and health issues.

**2.16 Mitigation and Remedial measures of mining impacts:** Key mitigation measures to protect and reduce the socio-environmental impacts are described as. The mitigation measure applied to one component of environment affects the other components, as these components are closely linked with each other. Protection of environmental quality with respect of pure air, water and soil is important for environmental sustainability.

**2.16.1 Environmental and Social Impact Assessment:** Environmental Impact Assessment (EIA) is a tool applied primarily to prevent or minimize the adverse effects, and maximize the positive effects, of mining activities from the inception to closure stage. This is basically linked to strategic environmental assessment (SEA), integrating policies and plans for impact assessment and mitigation. It provide information for decision-making on the environmental and social consequences of mining activities, it also ensures sustainability via the identification of appropriate mitigation measures. Sustainability is most effectively. Over the last few years, the importance of sustainability has been realized in Pakistan with public and government's intervention. To ensure the sustainability in mining, EIA can play both short-term and long-term goals to minimize the environmental and social impacts. The key scopes of EIA are:

- (i) To identify appropriate measures to mitigating the potential negative impacts of mining, and
- (ii) To enhance the benefits via suitable policies and regulations

**2.16.2 Soil Contamination Remediation:** Mitigation for soil impacts includes the use of best management practices during operational phases and a reclamation plan for re-establishment of viable soils and vegetation at closure. To conserve the soil sustainably, top soil has to be removed and kept separately for its use in reclamation and revegetation. In addition, the effective soil treatment approaches depend upon better understanding of the risks associated with metals in mine wastes. Organic amendments and biofertiliser accelerates the revegetation with native plant species, biological and chemical stabilisation of overburden dumps.



**2.16.3 Air Quality Improvement:** For dust attenuation, role of native plant species was studied and it was delineated that the broad leaved native dry deciduous tree species such as Albizzia lebbeck, Tectona grandis, Dalbergia sissoo have great potential to reduce dust in mining areas indicated that maximum dust is generated from the haul road. Effective green belt development has to be developed in different tiers for preventing the dust out of core and buffer zone of mine area.

**2.16.4 Water Quantity and Quality Improvement:** Mitigation measures to reduce the effects to water include:

- Staged development of the tailings storage facility so that the amount of water sent to the processing plant is minimized.
- Return of disturbed areas to natural runoff conditions as soon as possible.

Use of best management practices (BMPs) for site clearing and construction to minimize erosion and sedimentation is one of the best tools for water impact reduction. These practices will include diversion of runoff water away from roads and disturbed areas and the use of sedimentation ponds and silt fences.

The impacts on ground water resources can be improved by following methods:

- Construction of terraces, contours and peripheral bunds.
- Construction of Check dams. Rain water harvesting.
- Plantation with appropriate plant species.
- Coal mine water utilization

**2.16.5 Noise and Vibration Control:** Disturbance from noise could be alleviated using vegetation as a biological tool. The plants are good attenuators of noise in the mining areas. The scientific control blasting technique to reduce its impact on the environment in opencast and underground mining activities. Several studies have found that the vegetation also helped to decipher the impacts of noise and vibrations in mine operational areas.

**2.16.6 Conservation of Biodiversity:** Mitigation measures for habitat and biodiversity impacts include minimizing the footprint, translocation of native plant species to ecosystem reconstruction sites, conservation of plant micro reserves and larger areas, and reclamation. An environmental management plan for the reduction of human-animal conflict have been put forth along with conservation plan of wildlife corridor should be delineated.

**2.16.7 Socio-economic Development:** There is considerable complexity in managing the socio-economic impacts of mining. Impacts, mitigation measures and even benefits can result in many interacting effects, both positive and negative. Managing socio-economic impacts,



more so than other disciplines, involves minimizing negative effects and enhancing positive benefits. Rehabilitation plan include benefits through plantations towards societal benefits in mining areas. These included the employment generation and average timber valuation of selected plants in mining areas.. Reclamation of mine wasteland can be one of the potential area for employment generation, economic benefit of the local society.

**2.16.8 Corporate Social Responsibility:** Inclusion of corporate social responsibility (CSR) in mining plan is a new concept that broadly covers various related aspects such as triple bottom line approach (economic, environmental and social imperatives) of sustainability. CSR plays a special role in mining because of the inherent finiteness of the mineral resources and the environmental and social impacts related to mine closure. For mining, the CSR agenda is mainly aimed to increase the need for individual companies to justify their performance through the disclosure of social and environmental information. CSR activities focused on environmental and social aspects; particularly in mining perspectives ensure environmental sustainability, ecological balance, protection of flora and fauna, animal welfare, agro-forestry, conservation of natural resources and maintaining quality of soil, air and water.



## 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 Initial Environmental Examination (IEE) of the project. An efficient and effective organizational structure is essential for successful implementation of the mitigation measures identified for the project. Like other projects, the project, before its implementation, is required to go through an Environmental Assessment, in accordance with the provisions of the Punjab Environmental Protection (Amendment) Act 2012.

#### 3.2 Existing Legislation and Legal Framework

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

#### 3.3 Institutional Setup

##### 3.3.1 Environmental Protection Councils

The Punjab Environmental Protection Council (PEPC) is the apex decision-making body of Punjab. It has been developed under the provision of Punjab Environmental



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

### **3.3.2 Environmental Protection Agencies**

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

### **3.3.3 Environment Protection Department, Punjab**

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

### **3.3.4 Relevant Legal / Institutional Framework**

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

A number of laws have been promulgated by the Government of the Pakistan to deal with the environmental and social aspects related to the implementation of various development projects in the country. In 1983, the Government of Pakistan issued an Environmental Protection Ordinance (EPO) that was replaced by the PEPA, 1997, through an Act of Parliament. According to the 18<sup>th</sup> 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 2022. 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 2022

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

Salient features of the Regulations are listed below:

- Categories of project requiring IEE and EIA are issued through two schedules attached with the regulations.
- A fee depending on the cost of the project has been imposed for the review of IEE and EIA.



- The submittal is to be accompanied by an application in prescribed format included as Schedule IV of the Regulation.
- The EPA is required to issue conformation of compliance within 15 days of receipt of request and complete documentation.
- The IEE / EIA approval for construction of the project will be valid for three years from date of accord.

### **3.8 Guidelines for the Preparation of IEE/EIA Reports**

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

### **3.9 The Punjab Local Government Ordinance, 2001**

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

### **3.10 Pakistan Penal Code, 1860**

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

### **3.11 The Land Acquisition Act, 1894**

The Land Acquisition Act (1894) deals with the acquisition of private properties for public purposes. There are 55 sections in this Act mainly dealing with area



notification, surveys, acquisition, compensation, apportionment awards, disputes resolution, penalties and exemptions.

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

### **3.12 Factories Act, 1934**

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

### **3.13 Labor Laws**

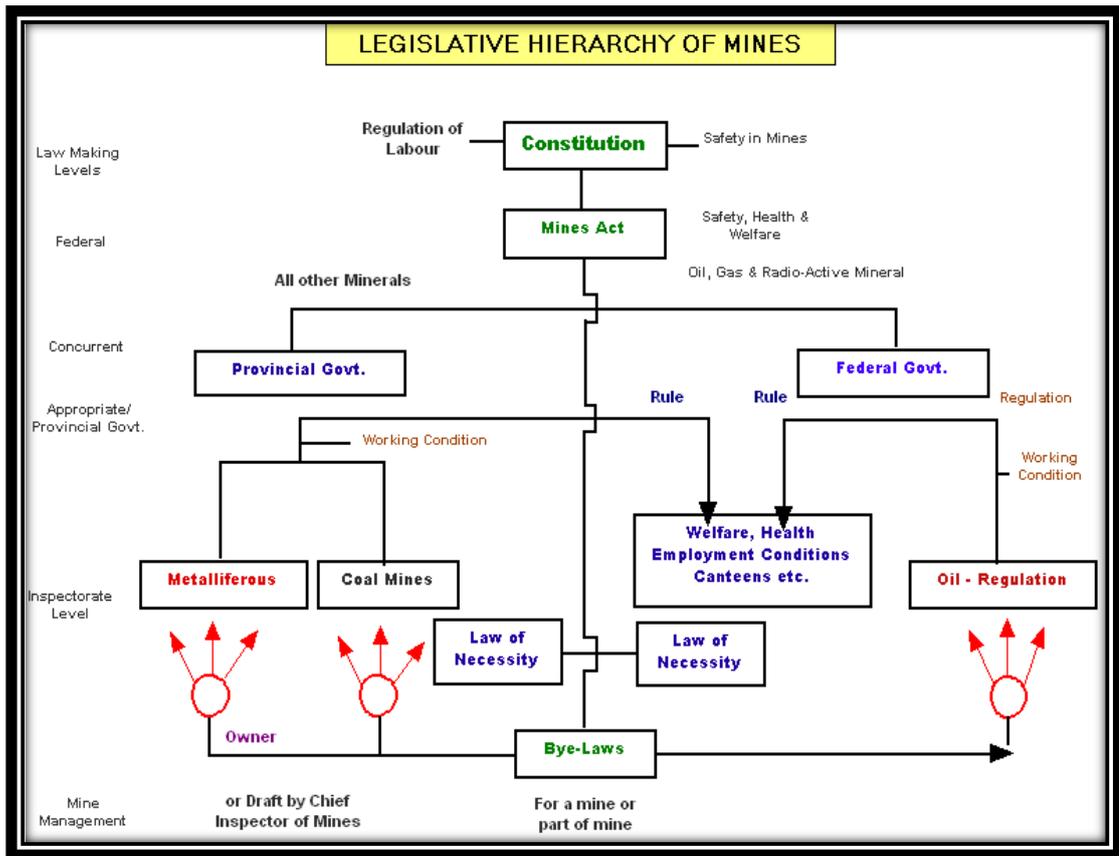
Construction and operational activities during the course of construction may affect occupational health of workers. Employers are required to abide by labor laws in respect of their own employees and also to ensure that contractors to follow the relevant labor laws and rules relating to safety of the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

### **3.14 Penalties**

Punishments are defined for various offenses committed by Mine Owners; Agent or any other person under their control which may extend from Rs.200/- to rigorous



imprisonment.





## **CHAPTER IV**

### **DESCRIPTION OF ENVIRONMENT**

#### **4.1 GENERAL**

This section covenants with the prevailing environmental conditions (physical, biological, ecological and socio-economic) of the project area. Information has been collected from different sources both primary and secondary data including; public literature, reports of other studies conducted in this area, knowledge with the proponent, the concerned government departments, the first-hand surveys and field measurements has been presented in this section.

#### **4.2 PHYSICAL ENVIRONMENT**

This part comprises of the study which examines the physical resources such as topography, soil, climate, water resources (surface and ground water), ambient air quality and geology of not only the project site but also the city as whole to assess whether the project under review can or does impact on any of these parameters. The description of physical environment of Khushab city and the project site is present in the following sub sections.

##### **4.2.1 Geological formation**

Khushab consists of agricultural lowland plains, lakes, and hills. Parts of the Thal desert touch the district, which has a breadth of over 70 miles (110 km) and is situated between the Indus River and the Jhelum River. The district is rich in natural resources (salt and coal).

##### **4.2.2 Climate**

The climate of most parts of the Project Area is arid to semi-arid characterized by four seasons in a year.



**Table 1: Seasons in Khushab**

Weather	Months
Autumn	Mid-Sep-Mid-Nov
Winter	November-March
Spring	March-April
Summer	April-October
Monsoon	July-September

#### **4.2.3 Temperature**

Project area falls in Punjab. Being flat topography, essential climate features are the same. The maximum temperature in summer reaches 44°C. In winter the minimum is 1°C. The mean maximum and minimum temperatures in summer are 41°C and 27°C; and in winter 19°C and 4°C respectively. The summer season starts from April and continues till October. May, June and July are the hottest months. The winter season on the other hand starts from November and continues till March, December, January and February are the coldest months.

#### **4.2.4 Rainfall**

The rainy season starts in July and ends in September. More rains occur in July and August than any other months. Most of the winter rains are received in the months of January, February and March.

#### **4.2.5 Topography**

Khushab is situated between the cities of Sargodha and Mianwali, near the river Jhelum and is located at 32°1'12.62"N 72°12'27.02"E. The district headquarters is situated at Jauharabad. Most people are associated with farming and agriculture.

Garden Kanhatti Garden near Khabbaki village is located in the Soon valley area, which is the largest forest in Khushab district. Katha Saghral area is semi-hilly and mineral area, noted for its coal and salt mining. Khabikki Lake is a salt-water lake in the southern Salt Range area in Pakistan. The lake is one kilometer wide and two kilometers long. Khabikki is also the name of a neighboring village. Sakaser is the highest mountain in the Salt Range area in Pothohar in Pakistan. It is 1522 meter / 4946 feet high. It is situated in Khushab District but it can be seen from adjoining



districts of Mianwali and Chakwal. Ochali or Uchhali Lake is just below the Sakasermountain, it is a salt-water lake in the southern Salt Range area in Pakistan. Sakaser (1522 meter / 4946 feet), the highest mountain in the Salt Range, looms over the lake. Due to its brackish water the lake is lifeless.

The Soon Valley or Soon Sakesar is one of the famous valleys of Pakistan situated in the central Punjab province. The Valley is situated in the north west of Khushab. Naushehra is the main town of the Valley. The Valley starts from Padhrar village and end to Sakesar that is the highest peak of Salt Range. The length of Soon Valley is 35 miles (56 km) and average width is 9 miles (14 km). The area of Soon Valley is 300-square-mile (780 km<sup>2</sup>). Although not as cold as the valleys up north, Soon valley consists of beautiful lakes, waterfalls, jungles, natural pools and ponds. Soon valley is also blessed with ancient civilization, natural resources, and fertile farms. There are some special features of this valley that distinguish it from other areas, without knowing about them it is very hard to understand its importance. Sabhral, Khura, Naushehra, Mardwal, Kufri, Angah, Ugali, Uchali, Tiveen and Bagh Shams-ud-Din are important towns in soon valley. Kanhatti Garden, Sodhi Garden, Da'ep and Sakesar are resorts to visit. Awan tribe is settled in Soon Valley of 159 m above mean sea level and lies on the left bank of the Indus river. The district was created in 1981 with Bhakkar city (known as Bakhar in Thalochi dialect of Punjabi language) as the capital. It is an area of 3,134 square miles (8,120 km<sup>2</sup>), most of it lies in the desolate plain of the Thal, but the Kachhi or strip of riverine land along the Indus is of great fertility. Its area consists of riverine tract along the Indus called Kacha and the Thal historically called Chol-e-Jalali. Most of its area comprises greater Thal. Mankera in centreof The Great.Thal is a place of great antiquity.

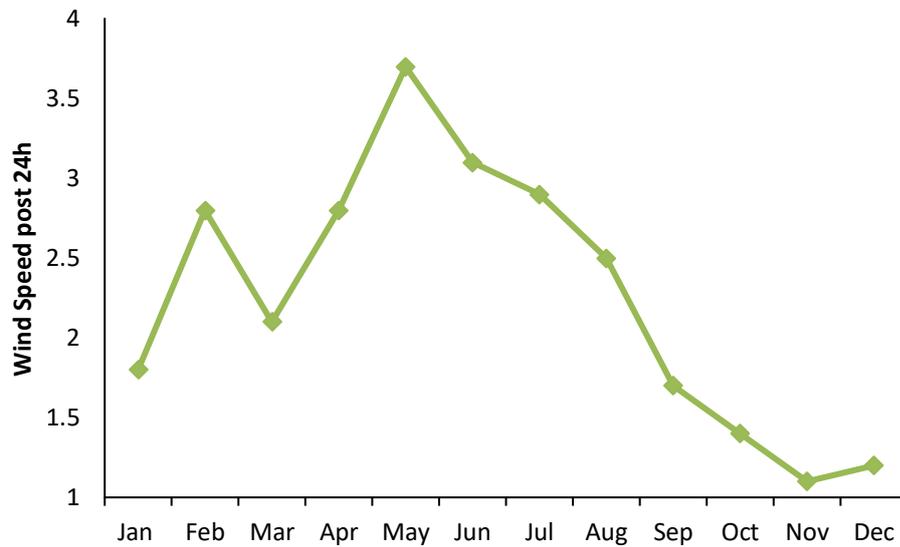
The Indus Valley is that part of the district which lies between two high banks of Indus River. The area close to the main stream is called as “Kacha” and beyond that is known as “Pacca”. The entire area is generally called as “Nasheb”. The floods in Indus, supply water to the cultivated land of “Kacha” area of the district. Thal, the sandy desert and prairie lies above the high banks of the Indus River.

#### **4.2.6 Wind Direction**

Wind direction is reported by the direction from which it originates. For example, a northerly wind blows from the north to the south. Wind direction is usually reported



in cardinal directions or in azimuth degrees. For example, a wind coming from the south is given as 180 degrees; one from the east is 90 degrees. A variety of instruments can be used to measure wind direction, such as the windsock and wind vane. Modern instruments used to measure wind speed and direction are called anemometers and wind vanes, respectively.



**Fig 4.1 Wind speed Post 24h of Khushab**

#### 4.2.7 Ambient Air Quality

The primary source of air pollution at the project sites is the vehicular emissions, and the key pollutants likely to be found at project locations are carbon monoxide (CO), oxides of nitrogen (NO<sub>x</sub>), sulfur dioxide (SO<sub>2</sub>), and particulate matter (PM). Other source of air pollution is dust arising from construction activities.

The subproject locations are well outside the metropolitan centers. There does not exist any large industry or any other significant pollution source near these sites/routes either. As a result, the ambient air quality of these sites is expected to be well within the acceptable limits, and no major criteria pollutants are likely to be found in excess of the limits prescribed by national and international standards.



#### 4.2.8 Water Resources

- **Surface Water**

The major surface water source in the area is Indus River, flows right side of the Bhakkar District. In addition to that there are few other surface water sources, which are used for irrigation purposes for agricultural lands in the area. There are three lakes (Ochali, Khabbaki and Sodhi Jay Wali) in the district.

- **Ground Water**

The main source of drinking water in the area is groundwater, which is pumped through hand pumps, pressure pumps and tube wells. The groundwater is also used for irrigation purposes.

##### 4.2.8.1 Drinking Water Quality

For establishment of baseline data secondary data was collected to assess the ground water quality and the feasibility of project site. Samples of ground water were collected from the 132Kv Grid Station Jauharabad District Khushab included in Tranche-IV, which is close to project, and got tested from NIBGE Faisalabad, an EPA approved Lab in the city. For baseline establishment, the sample of Ground Water was collected from 132Kv Grid Station Jauharabad District Khushab and tested to assess the groundwater quality. Data of Jauharabad District Khushab would be applicable as baseline data. However comparison of groundwater sample has been made with WHO drinking water standards.

Sr. No	Water Quality Parameter	Unit	WHO Standard for Drinking Water	132Kv Grid Station Jauharabad (Tranche-II addition Sub-Project)		
				Jan-12	Jan-12	Jan-13
1	PH	_____	6.5-8.5	7.39	7.32	7.1
2	Conductivity	(mg/l)	NG	5.04	6.38	5.48
3	Total dissolved salts TDS	(mg/l)	1000(WHO)	225	4083	3507
4	Hardness	(mg/l)	500(WHO)	326	782	984



5	Alkalinity	(mg/l)	NG	152	128	490
6	Chromium	(mg/l)	0.05	<0.01	<0.01	<0.01
7	Lead	(mg/l)	0.01	<0.01	<0.01	<0.01
8	Turbidity	*FAU	NG	<IFAU	<IFAU	<IFAU
9	Total Coliform	0 cfu/100ml	NIL(WHO)	95	-	20

**The baseline comparison Data for Jauharabad District Khushab**

**WATER PURIFICATION / FILTRATION PLANT:**

There are 06 water filtration plants in TMA Khushab which are working properly.

- 02 plants have been installed at Jauharabad
- 01 is working at Khushab.
- 02 filtration plants are under progress at Khushab by PHED and two have been proposed at Jauharabad and Hadali by District Government to facilitate the public.

**4.2.9 Noise Level**

As per PEQS for noise (effective from August 2016), permissible noise level is up to 75dBA at day time duration of 6.00 a.m. to 10.00 p.m. and 65dBA at Night time duration of 10.00 p.m. to 6.00 a.m. It is measured with a sound meter at a distance of 7.5m from the source. The concerned project remains operational only at day time from 8.00 a.m. to 5.00 p.m. At the project site the main source of noise emission is there only of dumpers during cutting of mines. Use of power equipment at operational sites where production of cement is being processed, is just of temporary nature. There is no extra noise regarding vehicles, other construction sites etc. Project site lies within the mines which are raw material for the project. As such there is no noise threat at the project site.

**4.3 Biological Environment**

Biological environment is the environment where life forms (such as wild animals and plants or bacteria) can exist, that affects human life (as in a particular place or period). The sum of environments where life forms exist is called the biosphere, these includes a portion of land, water, and ai





### 4.3.1 Flora

Trees, also called the ‘lungs’ of the earth, are important for the restoration of the eco-system. People can benefit immensely from their survival and existence. Trees have also been a source of medicine for thousands of years and a refuge for various species of birds. Several species of the trees in Khushab are being used in medicines. Some trees of significant medicinal value are grown easily in the area.

#### Inventory of Flora of Khushab

S.no	Common Name	Scientific Name
1	Indian Lilac	<i>Azadirachta indica (Linn.) A. Juss.</i>
2	Chinese date	<i>Ziziphus mauritiana Lamk</i>
3	Yellow	<i>Terminalia chebula Retz.</i>
4	Temple plant	<i>Crataeva adansonii DC.</i>
5	Bombax	<i>Bombax ceiba Linn.</i>
6	Bistula	<i>Cassia fistula Linn.</i>
7	India laburnum	<i>Acacia nilotica (Linn.) Delile.</i>
8	Indian banyan	<i>Ficus benghalensis Linn.</i>
9	Buddha tree	<i>Ficus religiosa Linn.</i>
10	Benzoil tree	<i>Moringa oleifera Lam.</i>
11	Devil tree	<i>Alstonia scholaris (L.) R.Br.</i>
12	Rosewood	<i>Dalbergia sissoo Roxb.</i>
13	Mango	<i>Mangifera indica L.</i>
14	Spanish cherry	<i>Mimusops elengi L.</i>
15	Jujube	<i>Ziziphus zizyphus Mill.</i>
16	Starfruit	<i>Averrhoa carambola Linn.</i>
17	Saucerberry	<i>Cordia alligator (Forssk.) Ehren. Ex Asch.</i>
18	Lasura	<i>Cordia myxa Linn.</i>
19	Chamror	<i>Ehretia laevis Roxb.</i>
20	Midnight horror	<i>Oroxylum indicum (Linn.) Vent.</i>
21	Bidi leaf tree	<i>Bauhinia racemosa Lamk.</i>
22	Temple plant	<i>Crataeva adansonii DC.</i>
23	Tropical almond	<i>Terminalia arjuna (Roxb. ex DC.) Wt. &amp; Arn.</i>



24	Beleric	<i>Terminaliabelirica</i> (Gaertn.) Roxb.
25	Chebolicmyrobalan	<i>Terminaliachebula</i> Retz.
26	Castor oil plant	<i>Ricinuscommunis</i> Linn.
27	Pongam oil tree	<i>Pongamiapinnata</i> (Linn.) Merrill
28	Asoka tree	<i>Tecomellaundulata</i> (Roxb.) Seeman.
29	Toon Tree	<i>Cedrelatoona</i> Roxb.exWilld.
30	Indian mahogany	<i>Chukrasiatabularis</i> Adr.Juss.
31	White cedar	<i>Meliaazedarach</i> Linn.
32	Mahogany	<i>Swieteniamacrophylla</i> King
33	Phulai	<i>Acacia modesta</i> Wall.
34	Siris Tree	<i>Albizialebeck</i> (Linn.) Benth.
35	Forest siris	<i>Albiziaprocera</i> (Roxb.)Benth.
36	Monkeypod	<i>Pithecellobiumdulce</i> (Roxb.) Benth.
37	Loong Tree	<i>Prosopis cineraria</i> (Linn.) Druce
38	Honey mesquite	<i>Prosopisglandulosa</i> Torr.
39	Mesquite	<i>Prosopisjuliflora</i> (Swartz) DC.
40	Country fig, Cluster fig	<i>Ficusracemosa</i> Linn.
41	White mulberry	<i>Morus alba</i> Linn.
42	Black mulberry	<i>Morusnigra</i> Linn.
43	Lemon-Scented Gum	<i>Eucalyptus citriodora</i> (Hook) K.D. Hill & L.A.S. Johnson
44	Night-flowering Jasmine	<i>Nyctanthes arbor- tristis</i> Linn.
45	Date palm	<i>Phoenix dactylifera</i> Linn.
46	Flame-of-the-forest	<i>Buteamonosperma</i> (Lam.)Taubert
47	Desert poplar	<i>Populuseuphratica</i> Olivier, Voy.
48	Indian willow	<i>Salix tetrasperma</i> Roxb.
49	Vann	<i>Salvadoraoleoides</i> Decne.
50	Toothbrush tree	<i>Salvadorapersica</i> Linn.
51	West Indian elm	<i>Guazumaulmifolia</i> Lam.
52	Athel tree	<i>Tamarixaphylla</i> (Linn.) Karst.
53	Salt cedar	<i>Tamarixdioica</i> Roxb. Ex Roth.
54	Bihul	<i>Grewiaoptiva</i> Drummand ex Burret



#### 4.3.2 Plantation Within and Around the Project

The study area is barren and has little amount of scattered flora but the vegetation within the project site is pretty impressive including variety of plants planted by the project management and they are planning more plantation within and around the site. Monumental plants include variety of roses (*Rosa culv*, *Rosa floribunda*, *Rosa floribunda*, *Rosa Floribunda*, *Rosa grandiflora*, *Rosa hybrid*, *Rosa Polyantha*), African Marigold (*Tagetes erecta*), motia (*Jasminumsambac*), Jasmine (*Jasminum officinale*), variety of evergreen plants (*Euonymus fortune*, *Prunus laurocerasus*, *Cercocarpus ledifolius*), grasses and trees like Mesquite (*Prosopis juliflora* (Swartz) DC.), Eucalyptus (*Eucalyptus citriodora* (Hook) K.D. Hill & L.A.S. Johnson, curry tree (*Murraya koenigii*), kikar (*Acacia karoo*), jujube (*Ziziphus mauritiana*), mango (*Mangifera indica* L.), shehtoot, Bombax (*Bombax ceiba* Linn.), Black mulberry (*Morus nigra* Linn.), Date palm (*Phoenix dactylifera* Linn.) are common within the project site.

#### 4.4 Tolerance Index of Flora present at the site

In order to evaluate the susceptibility level of plants to air pollutants, four parameters, namely ascorbic acid, chlorophyll, relative water content, and leaf-extract pH, were determine formulation signifying the air pollution tolerance index (APTI) of plants. APTI values of plant species, including herbs shrubs and trees, growing in the project site were estimated. Plants with a high index value were tolerant to air pollutants and vice-versa. On the basis of their indices, different plant groups were categorized into sensitive, intermediate, moderately tolerant plant groups. Plants with high APTI are preferred to grow in the project site.

#### 4.5 Flora of Project Area

The agriculture is by far the main economic activity in the central/ southern Punjab. The main crops during Rabi are wheat, gram, rape, mustard, barley and oil seeds. In Kharif, cotton, jawar, sugarcane, bajra, maize and rice are grown. In addition, there are subsidiary crops known as Zaid Rabi like Kharbooza, tobacco and potatoes and Zaid Kharif like potatoes and chilies.



S.no	Rabi	Kharif
1	Wheat	Cotton
2	Gram	Jawar
3	Rape	Sugarcane
4	Mustard	Bajra
5	Barley	Maize
6	Oil seeds	Rice
7	Kharbooza	Potatoes
8	Tobacco	Chillies
9	Potatoes	–

**Inventory of Rabi and Kharif crops**

Fruits grown are Mangoes, Date, Malta, Orange, Water and Musk melon, Guava, Citrus, Falsa, Jaman and Pomegranate. In the beginning of the cultivation era the inhabitants used to eat Pilu and Bair, the only wild fruits that grows intermittently. With the introduction of canal irrigation mango and other fruits are being grown on commercial basis. Wheat, cotton, sugarcane and rice are the major crops, whereas mango and citrus are the major fruits of the area. As per cropping pattern, wheat and sugarcane are the highest grown crops in the area.

**Fauna**

There is no wildlife except jackals, dogs and snakes etc. Common species of birds found in the city are Sparrows, Crows, Pigeon, Dove, Tiliar (starling), Parrot, Quail, Pintail and Humming bird etc.

S.no	Common Name	Scientific Name
1	Intermediate Egret	<i>Egretta intermedia</i>
2	Indian-Pond Heron	<i>Ardeola grayii</i>
3	Red-Wattled Lapwing	<i>Hoplopterus indicus</i>
4	Common Sandpiper	<i>Actitis hypoleucos</i>
5	White Wagtail	<i>Motacilla alba</i>
6	Yellow Wagtail	<i>Motacilla flava</i>
7	Red-vented Bulbul	<i>Pycnonotus cafer</i>
8	House Sparrow	<i>Passer domesticus</i>





9	Common Myna	<i>Acridotherestrictis</i>
10	Bank Myna	<i>Acridotheresginginianus</i>
11	Pied Myna	<i>Sturnus contra</i>
12	House Crow	<i>Corvussplendens</i>
13	Nectariniaasiatica	<i>Purple sunbird</i>
14	Black Drongo	<i>Dicrurusmacrocersusvieillot</i>
15	Black kite	<i>Milvusmigransmigrans</i>
16	Blue rocky pigeon	<i>Columba livia</i>
17	Little brown dove	<i>Streptopeliasenegalensis</i>
18	White-breasted Kingfisher	<i>Halcyon smyrnensis</i>
19	Little Green Bee eater	<i>Meropsorientalis</i>
20	Golden-backed woodpecker	<i>Dinopiumbenghalense</i>
21	Hoopoe	<i>Upopaepops</i>
22	Pheasant-tailed jacana	<i>Hydrophasianuschirurgus</i>

**Inventory of Fauna of Khushab**

**4.6 Socio Economic Assessment**

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

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

The objectives of the given study are outlined as follow:

- To carry out the assessment of social impact.
- Acquire socioeconomic data to evaluate and identify the project interventions.





- Assess needs of community related environmental concerns.
- To assess adverse and beneficial socioeconomic and health impacts of the activity.
- To suggest remedial measures and solutions to improve socio economic conditions.
- To analyze socio economic conditions of community, with special reference to environment and conservation of natural resources.

#### **4.6.1 Demographic Profile of Khushab**

According to Punjab Development Statics 2008, total poulation of Khushab District is 1,063,000 out of which 532,000 are male and 531,000 are females. The district consists of three tehsils, Khushab, NoorpurThal and Quaidabad and a Sub-Tehsil Naushehra. Inhabitants of Khushab District speak a great variety of Punjabi dialects: which are

- Shapuri (Main dialect of the district)
- Majhi or standard (in cities)
- Pothohari (Northern Hilly Side)
- Thalochi (southern areas near bhakar)
- Jandali (western areas near Mianwali)
- Urdu being national language is spoken and understood by most of the population. English is also understood and spoken by the educated elite.

The population of the district consist of self-employed (including farming and trade), private employees and government employees. The main occupation of women in rural areas are house-keeping which includes attending to the cattle, extracting butter and ghee from milk, weaving and sewing of family clothes. In addition they generally help their men-folk on farms with the lighter duties like transplanting of seedlings, threshing and winnowing of grains and sometimes they also help in harvesting. In city women are house-wives or work as professional's doctors, nurses, teaching and in offices.



#### 4.6.2 Health facilities

Sufficient medical and health facilities are available in Khushab. District Head Quarter & Taulka Head Quarter hospitals are established at District & Tehsil Headquarters respectively. In rural areas dispensaries & rural health centers are functional. There are also other hospitals of voluntary organizations which provide health cover to the general public.

Institute	Civil District	Number
Hospitals	Khushab	8
Dispensary	Khushab	34
Rural Health Centre	Khushab	5
Basic Health Centre	Khushab	41
T.B. Clinic	Khushab	1
Sub-Health Centers	Khushab	9
M.C.H Centers	Khushab	7

#### Number of health institution in Khushab

#### 4.6.3 Educational Facilities

According to the official website of District Khushab, the literacy ratio of the district is increased from 21.4 % (1981) to 40.5% (1988).

Name of Institute	Civil District	Institute	
		Male	Female
Primary	Khushab	484	351
Middle	Khushab	65	53
High/Secondary	Khushab	55	19
Higher Secondary (Class XI-XII)	Khushab	6	4
Intermediate and Degree Colleges	Khushab	4	8
Intermediate Colleges	Khushab	0	4
Degree Colleges	Khushab	4	4
Mosque Schools	Khushab	164	0

#### Number of educational Institutions (2007-08) in Khushab



#### 4.6.4 Transportation and Communication

The mode of transport in the local areas is through vans, motorbikes, chingchi, rickshaws, buses etc. People of the areas use all mode of transport for their purposes.

#### 4.6.5 Industrial Activities

Different types of industrial units are present in the district including cotton ginning & pressing, dairy products, rice and flour mills, brick kilns etc. However, the agriculture is the main stream activities in the areas. These industries are contributing towards the Gross domestic product (GDP) of the country. In the 1980s the district was classified as a tax-relief zone for new industries. This led to the establishment of many industries including cement, sugar, and textiles.

#### 4.6.6 Water Supply

TMA (Tehsil Municipal Administration) Khushab is operating water supply system. The water capacity of water supply in Khushab is as under:-

- Total no of Tube well is 11 Nos
- Total No of water works (canal source) is 03 Nos
- Water capacity (daily supply) is 26 Lac Gallons
- Total requirement per day is 58 Lac Gallons

#### 4.6.7 Social Obligations

Pioneer Cement Limited has been giving due importance to its social obligations particularly in areas surrounding the factory:

- Primary schools of boys and girls were constructed in 1995 in Chenki village and is being managed by the company.
- A dispensary was established near the factory site to cater the emergency requirements of the workers as well as villagers residing in the vicinity of the factory.
- A mosque has been constructed in Chenki village and is being maintained by the company.



- Metal road of 15km length was re-constructed in Chenki village and widened to 30 feet for the residents of Jabbi and Chenki villages.
- Donations were extended for construction of educational block in District Public School, Khushab.
- Donations were made to employees living in earthquake affected areas and also to the victims of these areas.
- PCL is playing an active role in Khushab District Industrial Association.
- PCL is providing technical support to vocational Training Institute, Quaidabad.

In addition to fulfilling social obligations in the adjoining areas, the Company also made donations to organizations like TB center, Family Support Program, Emergency response center and SOS school.

#### **4.6.8 Electric Supply**

FESCO Distributes and supplies electricity to about 3.21 million customers within its territory with a population over 27.5 million under a Distribution License granted by National Electric Power Regulatory Authority (NEPRA) pursuant to the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 (NEPRA Act). Geographical service area of FESCO comprises Faisalabad, Sargodha, Mianwali, Khushab, Jhang, Bhakker, T.T Singh and Chiniot.

#### **4.6.9 Telephone Facilities**

Landline and Cellular telephone facilities are present in the area.

- **Sites of Historical Significance in Khushab**

There are no official heritage sites or historic, religious or archeologically important sites located in the project work areas. There are no major historic or archaeological feature of note but there are few places of worship i.e. mosques within about 500m of the work.

#### **4.6.10 Quality Of Life Values**

Coal mining is normally considered to be highly unfriendly to the Environment because of its inherent processes difficulties. However, with the development of



technology, modern techniques are introduced now at coal mining which helps to reduce the pollution.

#### **4.7 Environmental Monitoring at the Site:**

##### **A. Ambient Air Monitoring**

Ambient Air Quality of all the prospective sites was monitored on the site, using monitoring Techniques as mentioned below;

- Automatic Portable Analyzer (Method: 40 CFR 50, App. C US-EPA)
- Calorimetric Improved west & Gaeke (Sod. TetrachloroMercurate) Method (Method: 40 CFR 50, App. C US-EPA)
- Griess Saltzman Method (ISO 6768)
- High Volum PM 10 Sampler (Method: 40 CFR 50, App. j US-EPA)
- High Volum Sampler (Method: 40 CFR Part 50)

The equipment was duly calibrated and well maintained in order to assure exact results for the baseline data. The ambient air monitoring was carried out according to the Punjab Environment Quality Standards, 2016 and monitoring time was also according to PEQS time. Results illustrated that monitoring values are within the limit set by PEQS. Results of ambient air monitoring is attached herewith this EIA report as an annexure.

##### **B. Ground Water Monitoring**

Ground water monitoring was carried out by the resource water which was actually ponds linked to ultimately rive Indus. Nature of sampling was grab sampling. The methodology of monitoring was carried out according to the US Approved method. The monitored values illustrated that values are within the PEQS limits set by EPA, Punjab. Monitoring report is attached herewith this EIA report as an Annexure.

##### **C. Wastewater Monitoring**

Wastewater sample was collected from the existing wastewater source. This pH and temperature was monitored on the spot and results showed that pH is neutral and temperature is also within the PEQS values. Remaining parameters for wastewater were also monitored which illustrated that parameters have values within the limits set



by EPA, Punjab. Results of these parameters are attached herewith this EIA report as an annexure. The samples of ground water and waste water were collected in clean, sterilized 1.5 liter plastic bottles and were properly sealed after analyzing temperature and pH value on the spot for further analysis back at the lab. The samples were then preserved in appropriate iced containers and transported back to the lab within 24 hours of collection for detailed analysis.

### **Noise Monitoring**

Noise monitoring was carried out at different location of the project site and readings were measured for 24 hours and results were within the PEQS set by EPA, Punjab. Results are attached herewith this EIA report.

## **4.8 Conclusion**

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

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



## CHAPTER V

### 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.

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.

#### 5.2 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 Proponent**

The project is Mining Lease for Coal by M/S Ghulam Muhammad Tiwana and the proponent is Mr. Malik Ghulam Muhammad Tiwana S/O Malik Muhammad Ali Khan Tiwana (Chief Executive).

**5.4 The Responsible Authority**

The management of Mining Lease for Coal by M/S Ghulam Muhammad Tiwana is the responsible for the impacts of their projects

**Table 5.1: Responsibility of “Mining Lease for Coal by M/S Ghulam Muhammad Tiwana” administration**

Sr. #	Positions	Stage	Environmental Responsibilities
1	Proponent / Owner	Operations/mining	<ul style="list-style-type: none"> <li>• Oversee Environmental Policy</li> <li>• Serve as primary contact to the regulatory authorities</li> </ul>
2	All Employees	Operation/mining	<ul style="list-style-type: none"> <li>• Attend training and understand their roles Understand the Environmental Policy / Objectives and act accordingly</li> <li>• Coordinate with the responsible authorities within the project to report any noncompliance to their Environmental Policy</li> </ul>
3	Operational Supervisor	Operational /mining	<ul style="list-style-type: none"> <li>• Understand the environmental policy of the project</li> <li>• Operate in accordance with the environmental policy</li> <li>• Ensure reducing solid waste generation</li> <li>• Reduce water and energy wastage</li> <li>• Ensure all machineries /equipment are in good conditions</li> <li>• Ensure health and safety of the workers</li> </ul>



			during construction phase
4	Maintenance Manager	Operation /mining	<ul style="list-style-type: none"> <li>• Understand the environmental policy of the project</li> <li>• Operate in accordance with the environmental policy</li> <li>• Ensure reducing the chances of increased solid waste</li> <li>• Reduce water and energy wastage</li> <li>• Ensure all machineries /equipment are in good conditions</li> <li>• Ensure health and safety of the workers during operational phase</li> <li>• Provides health, safety and environmental awareness trainings to the staff</li> </ul>
5	Administrative Person Deal with Environment Issues	Operational/mining	<ul style="list-style-type: none"> <li>• Understand the environmental policy of the project</li> <li>• Operate in accordance with the environmental policy</li> <li>• Reduce water and energy wastage</li> <li>• Ensure all machineries /equipment are in good conditions</li> <li>• Ensure health and safety of workers during operational phase</li> <li>• Receive health, safety and environmental awareness trainings</li> <li>• Timely coordination with the responsible authority</li> </ul>

**5.5 Methodology for consultation**

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.

### 5.6 Affected and wider community

The stakeholders contacted during the survey belonged to different categories of people as shown in the Table 5.2.

**Table 5.2: Categories of Stakeholders Interviewed in the Project Area**

Sr. No.	Stakeholder Category
1	Neighbor workers
2	Project workers
3	Potential Distributors

### 5.7 Issues Discussed

Following issues were discussed during the stakeholder consultation:

- Overall activities of the project operational phase
- Possible mitigation measures
- Benefits or implications of the project specifically for the local people

### 5.8 Findings of the Overall Discussion

- After making complete feasibility the site is being used for mining activities.
- Project increases revenue generation for the Government
- It create employment opportunities
- Local people should be given preference for employment in the project



Majority of people favored the project in a sense that the project overcomes the increasing needs of coal in market.

## **5.9 Socioeconomic Trends around the Mining Lease for Coal by M/S Ghulam Muhammad Tiwana, Khushab**

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 Mining Lease for Coal by M/S Ghulam Muhammad Tiwana, Khushab.

### **5.9.1 Study Population**

The target population was comprised of nearby lease area's workers around the project site of Mining Lease for Coal by M/S Ghulam Muhammad Tiwana, Khushab.

### **5.9.2 Study Size**

Therefore, approximately a total of 20 households of different socio-economic conditions were surveyed and their heads of households were our main respondents.

### **5.9.3 Study Instrument**

Data collection tool was questionnaire; it was a 19- items based semi structured questionnaire.

## **5.10 Sampling Procedure for Questionnaire**

### **5.10.1 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.



### 5.10.2 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.

### 5.10.3 Study Areas

Somehow at surrounding and nearer lease area was visited for socio-economic aspects. Details of these sites are discussed below. These areas were surveyed by team of Ecosphiron Environmental Services as per requirement of socioeconomic survey for Environmental Impact Assessment Report of Mining Lease for Coal.

Sr. #	Variables	Frequency	Percent
1	Name & Address	-	-
2	Date	-	-
3	Address & CNIC	-	-
4	Age	89 (above 30 years)	89%
5	Education	93 (under matric)	92.8
6	Occupation	96 (Private jobs)	95.9
7	Marital Status	99 (married)	99
8	If married then no. of children	87 (> 4)	86.7
9	Total Family members	90 (< 5)	90
10	Religion	97 (Islam)	96.8
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
14	Experience of Diseases	67 (no disease)	67
15	If Yes, then nature of disease	37	

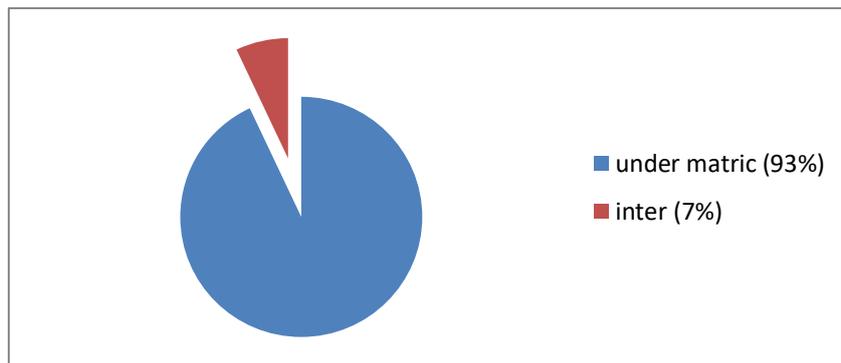


**5.10.4 Description of Tables:**

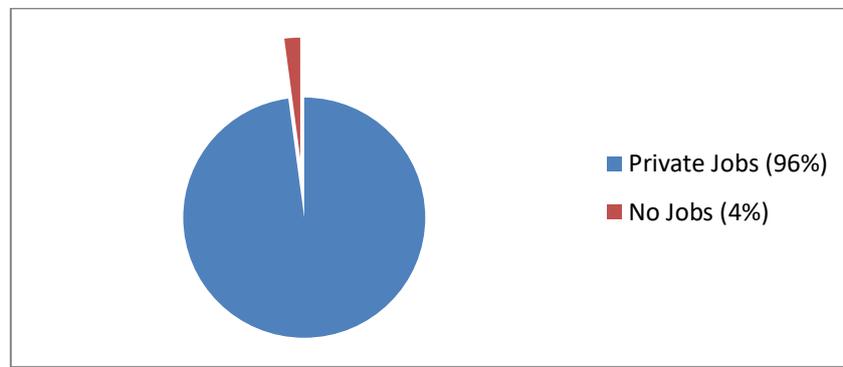
In the following table, only frequency and percentage has been measured (by SPSS) of those parameters which are probably present in maximum quantity.

**5.10.5 Site: Mining Lease for Coal by M/S Ghulam Muhammad Tiwana, Khushab.**

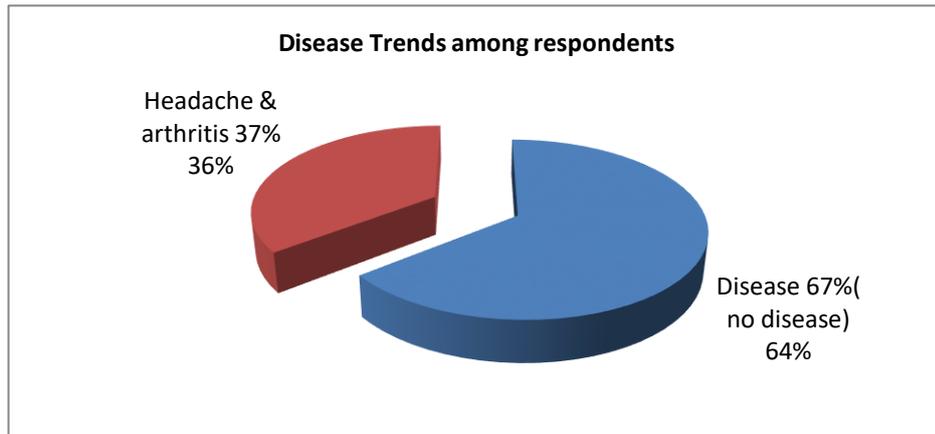
**Table5.1 Socioeconomic Questionnaire**



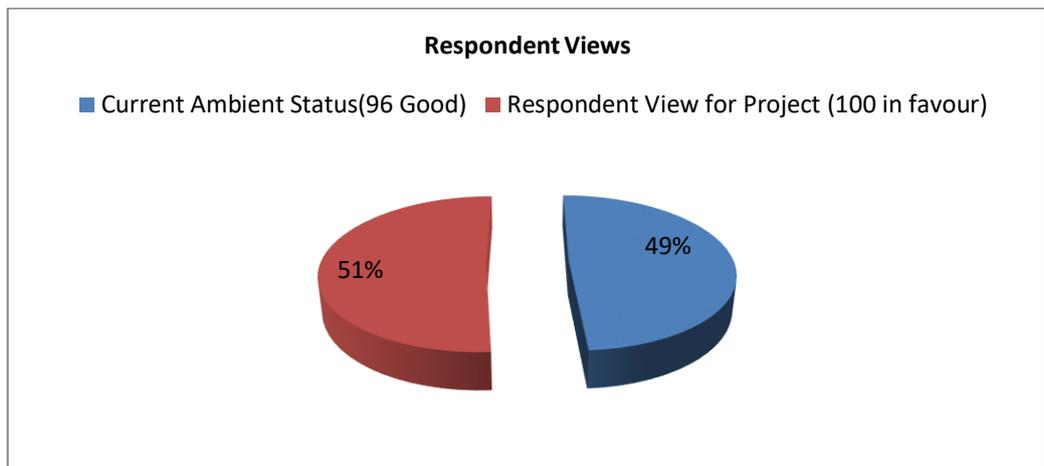
**5.1 Graphical Presentation of Education around the Project Site**



**5.2 Trends of jobs around the project site**



### 5.3 Health Status of Respondents



### 5.4 Respondent View about Project

#### 5.11 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:

##### 5.11.1 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.

#### **5.11.2 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.

#### **5.12 Other departments and agencies**

Other departments and agencies such nearby schools and other educational institutes were also surveyed during whole consultation process. The suggestions and mitigation measures has been incorporated in the Environmental Management Plan.

#### **5.13 Environmental practitioners and experts**

Environmental experts were also considered as integral part of this consultation process of Mining Lease For Coal By M/S Ghulam Muhammad Tiwana, Khushab. The suggestions and mitigation measures has been incorporated in the Environmental Management Plan. The project is benefited for the local community and it will enhance the employment.



**CHAPTER VI**  
**SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION**  
**MEASURES**

**6.1 GENERAL**

The environmental impacts were assessed during mining phase. The mitigation measures and monitoring program were also proposed. The detail explanation of environmental impacts and mitigation measures are described in this chapter. Mining Lease for Coal by M/S Ghulam Muhammad Tiwana, Khushab impacts are evaluated on the basis of magnitude, immediacy and sustainability. Evaluation criteria are as follows:

- Magnitude  
Type of impact (direct, indirect and cumulative)
- Immediacy  
Temporal extent (during construction, after construction)  
Spatial extent (local, widespread)
- Sustainability and Reversibility  
Mitigability (fully, partially)  
Monitoring (fully, partially)

**Environmental Problems Due to Project Location**

The project site situated at near Kalial, District Khushab. The potential impacts assessed due to project location are change in land use pattern, pressure on the existing natural resources, natural hazards like floods, earth quake, changes in the socio-cultural patterns of the local community, local community displacement issues, and obstruction of accessibility to the community already residing in the locality. A detailed explanation of each potential impact is given hereunder in tabulated form:



**Table 6.1: Environmental Problems/Mitigation Measures Due to Project Location**

	POTENTIAL IMPACTS	MITIGATION MEASURES
1.	<b>Change in Land Use Pattern</b>	
	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.	Prior to selection of site, the project proponent had careful consideration of site alternatives and hence due to current land use nature, price, and comparatively less environmental impacts the site was selected after discussion about alternatives.
2.	<b>Pressure of Resources</b>	
	Yet another impact to be considered prior to site identification is the availability of already existing resources e.g. water, gas, electricity, etc. any new intervention can exert pressure and marginalize the existing community. This could eventually create a sense of deprivation among the already existing community and may eventually result in social unrest.	Considering this very important factor, the site identification was done after evaluating the extent of provision of resources. The water requirements, energy requirement, social services (identified in the previous chapters) was done and based on the availability of resources to meet the present and future demand, the mentioned site was identified.
3.	<b>Natural Hazards</b>	
	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.	<b>Displacement of Local Community</b>	
	Displacement of local community can tend to create social issues and aggravate negative feelings from the existing population towards the project.	The project is planned on a site in lease area has already been acquired by the proponents after going through its socio-culture, environmental and economic considerations. The project is in lease area



		hence does not require local community displacement.
5.	<b>Accessibility Issues to the Local Community</b>	
	Another important impact considered was obstruction or changes in the patterns of transportation and increase travel time/distance for the local community.	The project site is located in the lease area and does not involve damage to any roads. Nature, size and scope of work also limit the extent of activities during mining phase.
6.	<b>Presence of Sensitive Areas</b>	
	Development interventions can degrade the quality and life expectancy of ecologically, socially and historically sensitive areas.	There are not sensitive areas of any nature be it ecological, social or historical in the project area.
7.	<b>Availability of Existing Infrastructure and Services</b>	
	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 major asphalt roads. Thus transportation and delivery of the products is not a big issue at project site.



**Table 6.2: Environmental Problems/Mitigation Measures Due to Project Design**

**6.3 IMPACTS OF OPERATIONAL PHASE/MINING PHASE**

The anticipated impacts related to the project have been studied for operational stage and is discussed as follows:

	<b>POTENTIAL IMPACTS</b>	<b>MITIGATION MEASURES</b>
1.	<b>Solid Waste Management</b>	
	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 project.	Solid waste generation from the mining activity, domestic and project process sources will be disposed off properly. Solid waste generated from the mining/extraction activity as loose rocks, silt, sand that will be utilized as road filling purpose, backfilling excavated areas etc. As such there will be no process waste during mining.
2.	<b>Wastewater Disposal</b>	
	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.	There will be not wastewater because at the project site there will be only need for drinking purpose. The water will not be needed for the production while the project site is lease site where only mining activity will be done. The work will be done in the day time only so water requirement will be temporary and no wastewater will be



		generated at the site.
3.	<b>Energy Conservation</b>	
	Excessive use of energy exerts more pressure on the already dwindling energy resources of the city/country.	At the project site, energy requirement is not needed because project is coal mining and if labor need energy for rest etc then generator will be provided.
4.	<b>Noise Generation</b>	
	Noise emissions due to traffic and any activities create issues to the residents.	Any activity that leads to noise pollution is restricted.  The activities will be timed so as to there is negligible inconvenience to the affected.
5.	<b>Emergency/Fire Hazards</b>	
	Emergencies e.g. fire incidents may lead to environmental, health and safety issues to the local residents.	Emergency preparedness will be done during excavating activities. Alarms at suitable locations are also mentioned.
7.	<b>Training of Staff</b>	
	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 is 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.	<b>Social Impacts</b>	
	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 is within the mines area. 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 have hired from the local community to avoid social issues.
9	<b>Transportation</b>	
	Transportation of raw material for safety stuff manufacturing to and from the project site creates a probability of accidental spills and fire.	The transportation of the mined coal will not be required as the mining will be situated inside the mining site.



## CHAPTER VII

### ENVIRONMENTAL MANAGEMENT AND 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 Mining Lease for Coal by M/S Ghulam Muhammad Tiwana” at near Kalia, District Khushab. To ensure that these measures are incorporated in the operation phase of the project, it is necessary to develop a comprehensive Environmental Management Plan (EMP). This section outlines the 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.

#### **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.

#### **7.1 GOALS OF ENVIRONMENTAL MANAGEMENT PLAN**

The following are the primary goals of EMP:

- Ensure implementation of mitigation measures.
- Ensure that the operational phase of project meets all environmental related legal obligations.
- Provide a mechanism for taking timely actions for unanticipated environmental situations.



**7.2 ENVIRONMENTAL MANAGEMENT PLAN**

No further suggestions will be carried out on the project area; therefore, the Environmental Management Plan to be enforced during operational phase will be implemented by the proponent. Administration of the plan will manage all the environment related activities including its monitoring and reports. Administrator will be responsible person for all plant related activities. Monitoring program/ management plan has been prepared for the project and is given in table 6.1.

**Table 7.1 Environmental Management Plan (EMP)**

<b>Aspects</b>	<b>Potential Impacts/Risks</b>	<b>Proposed Mitigation Measures</b>	<b>Responsibility</b>
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	Mining Lease For Coal By M/S Ghulam Muhammad Tiwana will be worked in lease area.	Plantation will be done in the specified areas in Khushab	Project Contractor
Traffic Movement	Movement of vehicles may result in traffic disruption if proper parking facilities are not provided.	Adequate parking facilities will be provided for tractor-trolleys bringing the material from the lease area	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 Excavated Material	Dumping of excavated material in the surrounding area may limit use of land	Waste generated due to mining will be loose rocks which will be used for paving of roads etc.	Project Contractor
Air Quality	Dust produced due to mining activity can affect the health of employees and residents in the surrounding areas	During mining, workers will be provided with masks for protection against the inhalation of dust during mining. Regular monitoring of all vehicles, equipment, and machinery used for mining. All vehicles, machinery, equipment and generators used during mining activities will be kept in good working condition and properly tuned and maintained in order to minimize the exhaust emissions.	Project Contractor
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 equipment; and use of appropriate muffling devices,	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	No Impact	



	involved		
Traffic Management	Disturbance to routine traffic moving on the Road	Observation of timing by the vehicles carrying coal cause minimum disturbance to traffic on the main road. The equipment and machinery will be stationed in the boundary premises to avoid the traffic congestion on the approach road	Project Contractor
Poverty Alleviation	Coal mining will generate the employment opportunities to the population living in the surrounding areas.	Minor positive	-
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. First aid box and emergency relief will be provided at the project site to meet the emergency needs.	Project Contractor

**7.2) Staff Training Schedules:**

Staff training is important parameter that needs to be fulfilled adequately in order to ensure the successful implementation of environmental objectives. Keeping this fact under consideration, project will ensure that the employees, contractors and workers receive appropriate environmental awareness training. This will be obtained through a variety of methods including training sessions, formal/informal meetings and discussion and formal presentations. Environmental awareness training would take



place at various stages of the persons concerned with the project. This would occur at the induction of any new employee/contractor/workers and will be made a regular on-site feature. Records of training content and attendance will be maintained.

Project would require the persons involved during operational phase to be aware of following responsibilities and equipment, maintenance detail:

Their roles and responsibilities (including environmental incident reporting)

2. The environmental impacts (potential and actual) of their activities during operation
3. Natural hazards such as earth quake and floods etc.
4. The potential consequence of poor environmental performance
5. Site emergency plans and their execution procedures

**7.3 Persons involved during operational phase to be aware of following responsibilities and equipment, maintenance detail:**

#	Description	Responsibility	Who will be involved	Outcomes
1	Air Quality	Administration	All employees	<ul style="list-style-type: none"> <li>• Better understanding of the health impacts associated with air pollution</li> <li>• Develop a monitoring and reporting system for air pollution</li> <li>• Third party involvement especially EPA approved labs will be decided under potentially harmful circumstances</li> </ul>
2	SWM	Administration	Staff	<ul style="list-style-type: none"> <li>• Improved understating regarding health impacts associated with unplanned waste management</li> <li>• A monitoring and reporting system that would enable the supervisor to keep control of all unnecessary scattering</li> </ul>
3	Wastewater	Administration	Employees	<ul style="list-style-type: none"> <li>• Improved understanding of the</li> </ul>



			but specific attention to the staff	<ul style="list-style-type: none"> <li>conservation techniques</li> <li>Quality assurance through lab analysis if need be found</li> </ul>
4	Noise	Administration	All employee	<ul style="list-style-type: none"> <li>Monitoring and reporting system for noise related issues if detected</li> <li>Appropriate measures would be identified and implemented</li> <li>Guidance to the employee on adopting good practices for noise and any other practice that otherwise could lead to environmental nuisance.</li> </ul>
5	Landscaping	Administration	Staff	<ul style="list-style-type: none"> <li>Improved efforts for maintaining the green belts and tree plantations</li> </ul>
6	Accidental Spills	Administration	All staff	<ul style="list-style-type: none"> <li>Improved understanding regarding how to react during minor and major spills according to the measures identified</li> </ul>

**7.4 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/Khushab.
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.

**COST BREAKUP STRUCTURE FOR ENVIRONMENT**

Sr. #	Items	Cost
1	Tree Plantation	40,000/-
2	PPEs	40,000/-
3	1 <sup>st</sup> Aid Box	25,000/-
4	Safety Signs	20,000
Total		125,000/-



## **7.5 ORGANIZATIONAL STRUCTURE & RESPONSIBILITIES**

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

- **Primary Responsibilities:**

The primary responsibility for implementing EMP within the company lies with Chief Executive of Mining Lease for Coal by M/S Ghulam Muhammad Tiwana.

- **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.



## 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 Mining Lease for Coal by M/S Ghulam Muhammad Tiwana, Khushab meets the administrative and legal framework of the EPA Punjab.

- Implementation of EMP must be given top priority.
- During mining 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 mining.
- Installation of fire extinguishers in the premises.
- Use of equipment with low operating noise levels within PEQS limits and regular monitoring of machines used during operational phase.

#### 8.1 Conclusion:

In view of the above it has been concluded that Mining Lease for Coal by M/S Ghulam Muhammad Tiwana, Khushab 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 Mining Lease for Coal by M/S Ghulam Muhammad Tiwana meets the administrative and legal framework of the EPA Punjab.
- Implementation of EMP must be given top priority.
- Provide guidance to workers on use of PPEs and also make it compulsory for them to use PPEs during mining.