



**D.G. KHAN
CEMENT COMPANY LIMITED
KHAIRPUR PROJECT**

**MINING LEASE FOR EXCAVATION
OF ARGILLACEOUS CLAY NEAR
KHAIRPUR (DISTRICT CHAKWAL)
ENVIRONMENTAL IMPACT ASSESSMENT**

**REPORT
OCTOBER, 2004**

**Prepared by
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**MINING LEASE FOR EXCAVATION OF ARGILLACEOUS
CLAY NEAR VILLAGE KHAIRPUR (DISTRICT CHAKWAL) –
ENVIRONMENTAL IMPACT ASSESSMENT REPORT**

EXECUTIVE SUMMARY

1.0 INTRODUCTION

D.G. Khan Cement Company Limited Khairpur Project is located near village Khairpur on Kallar Kahar – Choa Saiden Shah road at a distance of about 12 km from Kallar Kahar, District Chakwal.

An area of 5560.95 acres has been leased to D.G. Khan Cement Company Limited for the purpose of quarrying clay from near village Khairpur (District Chakwal) by Directorate General of Mines and Minerals Punjab (Large Scale Mining Section) vide letter number DG(M&M) – LSM/ML-CKL-1-Arg Clay (10)/of 04 September 2004.

2.0 REPORT FORMAT

Keeping in view the legal obligation under the Pakistan Environmental Protection Act, 1997 (PEPA,-1997), the Director General Mines and Minerals Punjab has directed the client to submit an Environmental Impact Assessment (EIA) report and the extent of any adverse effects which the quarrying operation may cause and proposal for minimizing those effects.

This present report is submitted to the said authority accordingly. The EIA report consists of nine sections. Section I deals with the project description and need & objectives of EIA. Section II covers the environment related documents and legal framework. Section III encompasses the existing project environments (Physical, biological and socio-economic/human). Section IV includes the identification of environmental issues and their impacts on the baseline environments. In section V negative impacts have been identified and mitigation measures to minimize their impacts have been mentioned. In section VI after having identified the positive impacts enhancement measures have been suggested. Aim, objectives,

organization and the functions of Monitoring Department on the project site are discussed in section VII. Rehabilitation/development plan has been given in section VIII. Conclusions drawn from the EIA study and the ensuing recommendations are appended in section IX.

3.0 EXISTING PROJECT ENVIRONMENTS

3.1 Physical Environments

3.1.1 Water Resources – Small natural channels for drainage of rain water criss-cross the quarry area. Ground water is available at a depth of about 100 – 150 feet. The area is arid and rainfed.

3.1.2 Land Resources – The quarry areas of clay are located at a distance of 1 - 4 km from plant site.

3.2 Biological Environments

3.2.1 Flora – Being arid in nature there is no worth mentioning vegetation in the area except some small bushes scattered here and there.

3.2.2 Fauna – Jackals, boars, foxes and reptiles are found in small numbers. Peacocks once found in large number are now very rare.

3.3 Socio-Economic/Human Environments

3.3.1 Social – About 8,000 persons live in village Khairpur, while Khokhar Bala, Chak Khushi and Dalailpur have populations of 7,500, 1,090 and 4,800 respectively.

3.3.2 Economic – People are mostly farmers with small land holdings. Many people are serving in the armed forces. Chakwal is the hub of industrial and business activities.

4.0 EIA PROCEDURE

4.1 General – EIA study has been carried out in accordance with PEPA- 1997 Guidelines. The relevant stakeholders were consulted as regards their views for setting up the plant.

4.2 Significant Positive Impacts

4.2.1 Quarried land will be usefully recovered for vegetation and tree plantation suited to the local climatic conditions of the area.

4.2.2 Drainage and physiography will exhibit significant positive change.

4.2.3 Lifestyle of the local people will improve through economic benefits to accrue from jobs in the factory.

4.3 Negative Impacts

4.3.1 Only a few minor negative impacts are envisaged which will be mitigated with routine environmental management practices.

4.3.2 Some quantities of dust will be generated during quarrying operation and noise. Their levels will remain within the prescribed limits of the National Environmental Quality Standards (NEQS) because adequate measures will be adopted to minimize them by taking preventive and control measures. Agencies responsible for mitigation and enhancement measures have been specifically earmarked for effective implementation.

5.0 ENVIRONMENTAL MONITORING AND EVALUATION

5.1 Formation of Environmental Monitoring and Evaluation Departmental has been proposed from within present establishment with General Manager (Works) as its head assisted by Health, Safety and Environment Officer.

6.0 REHABILITATION/DEVELOPMENT PLAN

6.1 A comprehensive rehabilitation/development plan is suggested with the purpose of environmental preservation. Salient features of the same are appended below:

- 6.1.1** Recycling of overburden.
- 6.1.2** Control of erosion and runoff.
- 6.1.3** Upbringing of natural habitats and ecosystem.
- 6.1.4** Observance of the NEQS.
- 6.1.5** Extensive tree plantation.

7.0 CONCLUSIONS AND RECOMMENDATIONS

7.1 Conclusions

7.1.1 D.G. Khan Cement Company Limited is endeavoring to improve the local environment by implementing the Environmental Management Plan.

7.1.2 The clay quarry site is economically viable, socially acceptable and environmentally sound. It adds to the sustainable development of the local area.

7.2 Recommendations

7.2.1 Actions should be taken to minimize generation of dust and noise.

7.2.2 Medical check up of the quarry site workers should be undertaken frequently as a preventive measure.

7.2.3 Services of environment specialist should be hired for regular review of the environmental situation.

7.2.4 The quarry site should be rehabilitated as planned.

7.2.5 Testing of particulate matter in the air should be carried out on monthly basis by a third party.

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SECTION I - INTRODUCTION

1.0 PROJECT DESCRIPTION

1.1 Background

- D.G. Khan Cement Company Limited has planned to establish 6,700 tons per day capacity cement plant near Village Khairpur (District Chakwal).

1.1.1 Salient Features of the Project

- Clay quarry sites are located at a distance of about 1-4 km from the factory. An area of 5560.95 acres has been granted to D.G. Khan Cement Factory Limited by the Licensing Authority. Estimated reserves are: Clay Deposit Number 1 –160 million tons and Clay Deposit Number 2-- 70 million tons. Its quality is excellent for production of good quality cement.
- Elevation of clay features varies from 15-20 meters. The clay deposits are covered with overburden of pebbly stones which is required to be removed for obtaining Argillaceous Clay.
- **Exploitation/Mining of Clay:** Initially Clay Deposit Number 1 will be exploited. After removal of over burden including silt/sandy materials and pebbly stones from the surface the clay will be excavated by bulldozer and loaded into road dumper. The clay will then be transferred to clay /limestone crusher area. No drilling or blasting will be carried out for mining of clay. Haulage of the clay will be done during day time. The crusher will be operated for six days/week on two shifts/day basis. Its capacity is 1500 tons / hour.

1.2 NEED FOR EIA

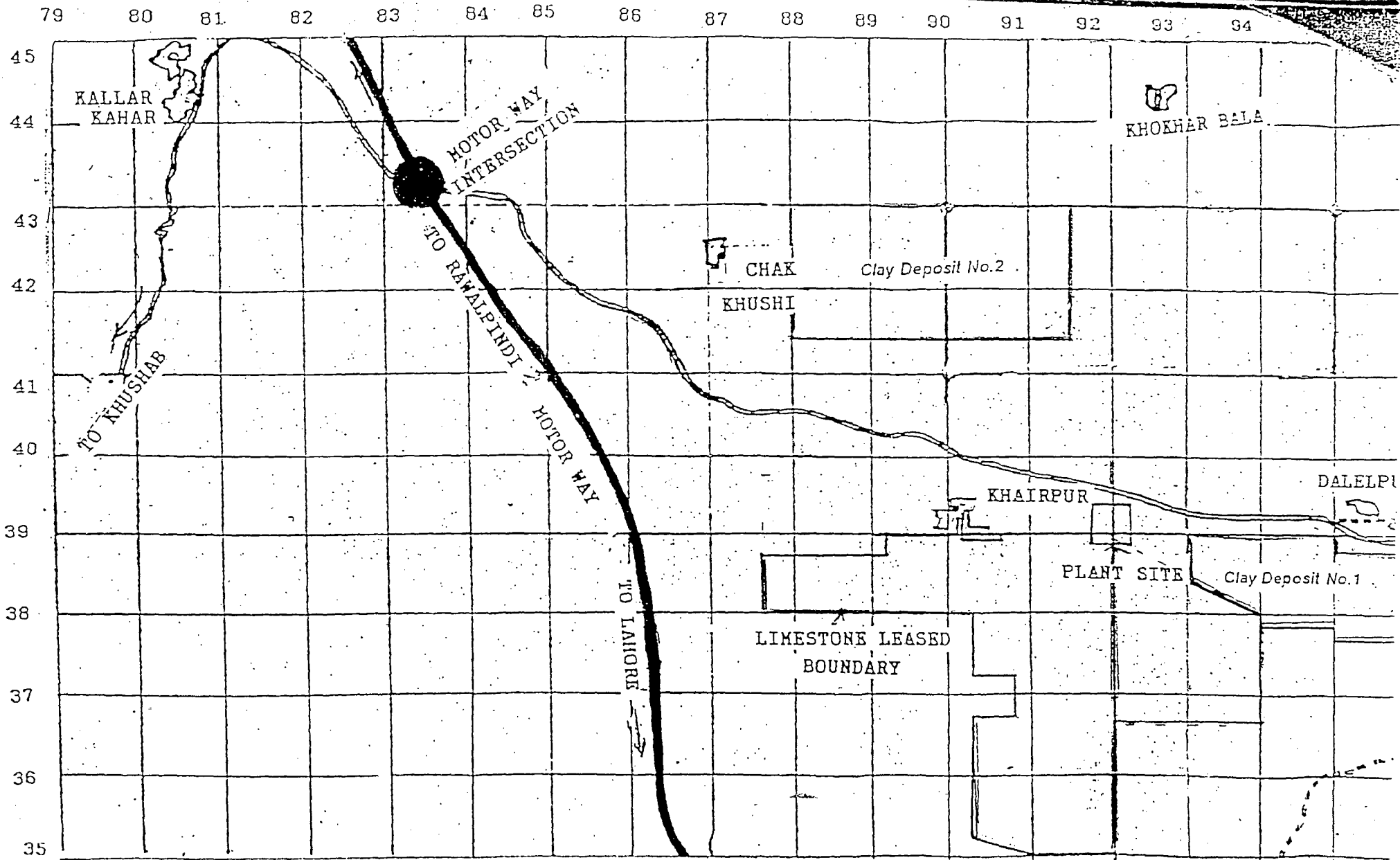
1.2.1 For the sustainability of a development project it is imperative that it should be economically viable, socially acceptable and environmentally sound. Therefore, Government of Pakistan (GOP), according to Pakistan Environmental Protection Act (PEPA-1997) and the funding agencies like The World Bank and Asian Development Bank have made it obligatory to submit the EIA report to competent authority for approval prior to implementation of the project.

1.2.2 In view of the requirement of the law of the land, the Director General Mines and Minerals Punjab directed the D.G Khan Cement Company Ltd., "to submit an EIA report and extent of any adverse effect which the quarrying operation may cause and proposal for minimization of that effect". The present EIA report is submitted in compliance with this directive.

1.3 Objectives of EIA

The objectives of the present EIA report are:

- 1.3.1** To identify the environmental issues relevant to the quarrying of limestone.
- 1.3.2** To assess environmental impacts in terms of both quality and quantity.
- 1.3.3** To suggest mitigation measures for minimizing of the adverse impacts.
- 1.3.4** To suggest enhancement measures for improving the positive impacts.
- 1.3.5** To propose rehabilitation/development plan for the quarried area.



3- MINING LEASE AREA FOR THE LIMESTONE AND SELECTED CLAY AREAS IN THE D.G.KHAN CEMENT PLANT AREA, KHAIRPUR DISTRICT CHAKWAL, PUNJAB, PAKISTAN

PLAN SHOWING THE AREA GRANTED TO M/S
 D.G. KHAN CEMENT COMPANY LTD FOR
 MINING LEASE OF ARGILLACEOUS CLAY
 NEAR KHAIR PUR IN DISTRICT CHAKRAL.

FILE NO. APP-CKI-T. ARG-CLAY (1)

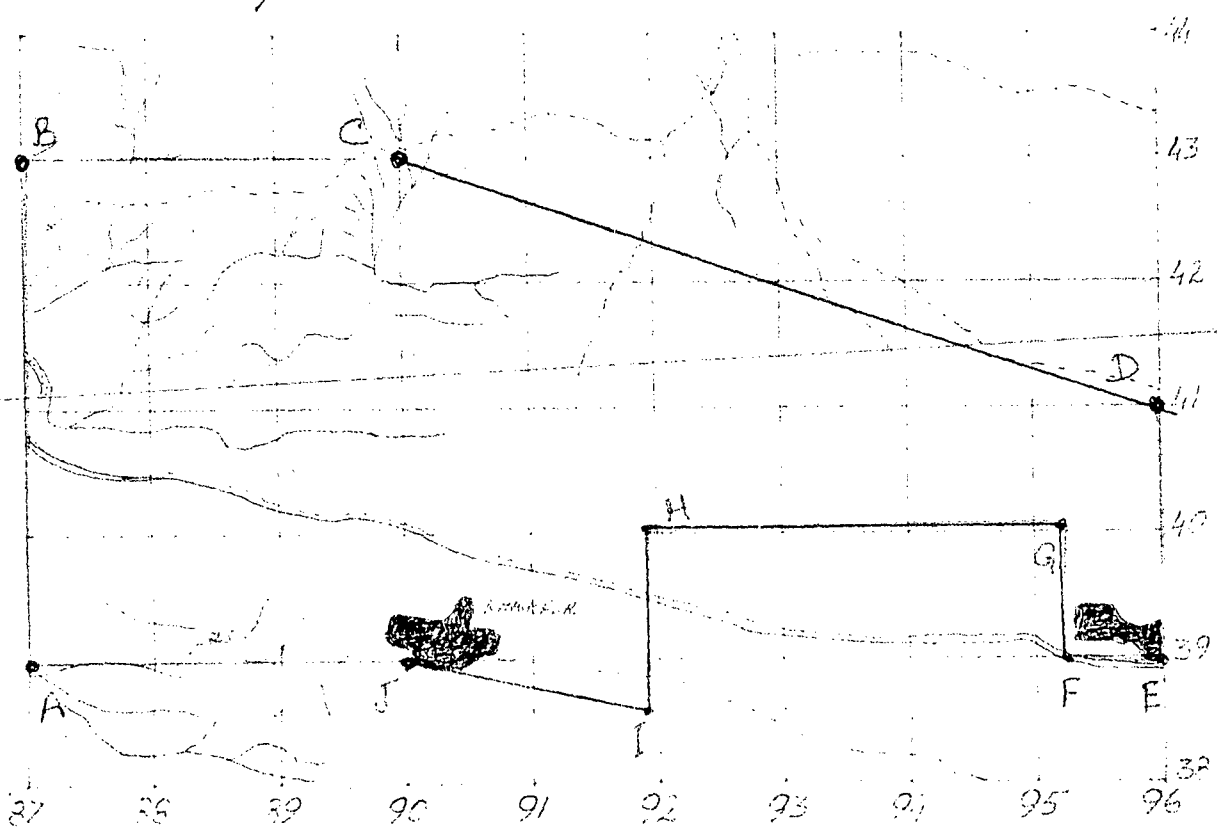
ML-CKI-T. ARG-CLAY (10)

D A T A

POINTS	EASTINGS (YDS)	NORTHINGS (YDS)
A	87000	39000
B	87000	42000
C	90000	43000
D	96000	41000
E	96000	39000
F	95200	39000
G	95200	40050
H	91900	40050
I	91900	38600
J	90000	39000
TOTAL AREA = 5560.95 ACRES.		

SHEET NO -- 43 / 13 & 14

SCALE -- 1:50,000 YARDS.



**SECTION II - ENVIRONMENT RELATED DOCUMENTS
AND LEGAL FRAMEWORK**

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2.1 DOCUMENTS CONSULTED

The following documents had been consulted during preparation of the present EIA report:-

- 2.1.1 Census Report of District Chakwal, 1998.
- 2.1.2 Government of Pakistan and IUCN, (1992), Pakistan National Conservation Strategy, Islamabad.
- 2.1.3 D.G. Khan Cement Company Limited, Mining Development Scheme, 2004.
- 2.1.4 D.G. Khan Cement Company Limited, Project Brief, 2004.
- 2.1.5 Survey of Pakistan, Topo Sheet Number 43 D/14.

2.2 Discussions Held

In order to know the opinion of the people of the project area about the project siting, discussions were held with some stakeholders including residents of village Khairpur and other nearby villages, personnel from public sector etc.

2.3 Pakistan's Environmental Legal Framework

- 2.3.1 Pakistan's Environmental Protection Act, 1997 (PEPA, 1997) and NEQS.
- 2.3.2 Government of Pakistan, Pakistan Environmental Protection Agency, Policy and Procedures for Filing, Review and Approval of Environmental Assessment, 2000.
- 2.3.3 In addition to above, a number of laws and rules are also applicable under varying situations. Certain important enactments are given below:
 - The Canal and Drainage Act, 1873.
 - The Factories Act, 1934.
 - The Punjab Plantation and Maintenance of Trees Act, 1974.

- The Punjab Wildlife (Protection, Preservation, Conservation and Management) Act and Rules, 1974.
- The Regulation of Mines, Oil-Fields and Mineral Development (Government Control) Act, 1946.

2.4 INTERNATIONAL AGENCIES' GUIDELINES

2.4.1 Environmental Assessment Requirements and Environmental Review Procedures of the Asian Development Bank, 1993.

2.4.2 Environmental Impact Assessment – Basic Procedure for Developing Countries, United Nations Environmental Programme, 1998.

2.4.3 The World Bank Operational Directive 4.00 Annexure A, Environmental Assessment, 1999.

2.4.4 The World Bank Operation Policy 4.01 Annexure B, “Content of an Environmental Assessment Report for Category A Projects”, 1999.

2.4.5 The World Bank Operation Policy OP 4.04, “Natural Habitats”, 2001.

2.5 NATIONAL ENVIRONMENTAL QUALITY STANDARDS-PAKISTN PERTAINING TO QUARRYING SITES

2.5.1 **Ambient Air Quality** –So far no standards for ambient air quality are in place in Pakistan and the control is based on “at source compliance”. Hence the standards as provided in the NEQS- Pakistan need to be followed during all operations whatsoever.

2.5.2 **Dust Control Measures** – All the machinery components related to material handling and storage should be fitted with the latest state –of- the- art anti pollution equipment.

SECTION III EXISTING PROJECT ENVIRONMENTS

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3.1 PHYSICAL ENVIRONMENTS

3.1.1 Water Resources

- **Surface Water** – The clay quarry sites are criss-crossed with a number of small water channels for rain water drainage.
- **Ground Water** – Hand pumps, a few Persian wheels and tube wells have been installed around the project area. Water is available at a depth of about 100 – 150 feet. It is fit for drinking.
- **Wetland** – Jhelum River (27 km) and Kallar Kahar Lake (12 km) are wetlands in the area.
- **Irrigation** – Being arid zone, some patches of land are under agricultural use when there is rain in the area. However, in some areas irrigation is done by tube wells on small scale.
- **Fisheries** – There is no fish pond in and around the quarry sites up to long distances. However, fishing is done in the River Jhelum.

3.1.2 Natural Habitats

- Clay deposits form the natural habitat. The clay will be quarried up to the ground level.

3.1.3 Land

- **Physiography** – The clay lease areas are located at a distance of 1-4 km. from the plant site.
- **Geology** – Clay deposits are found at two places as under with thickness of 15 meters.
 - **Clay Deposit Number 1** – This deposit is located at a distance of 1km on the east of plant site and to the south of Dalailpur. Clay was formed due to fluvial sedimentation during Quarternary

Period. It has sand stone and Shale of Murree Formation of early Miocene Period. Clay reserves are to the tune of 54 million tons.

- **Clay Deposit Number 2** –It is situated near Chak Khushi-Khokhar Bala area at about 3-4 km. to the north-west from the plant site. The clay is of Kamalia formation of Middle to Miocene Period. The deposits are estimated to be 79 million tons.
- **Sedimentation** – The rain water brings some sediment load in the natural water channels and also in the plain areas.
- **Land Use** – After quarrying of clay the land will be leveled with the surroundings and can be used for recreation park, plantation and vegetation purposes.
- **Land Holding/Tenure** – Land holding size extends from a few kanals to a few acres only. Being arid and in small holdings, most of the land is cultivated by the farmers themselves.

3.1.4 Climate

- **Weather** – District Chakwal lies in the sub tropical region. The quarry site experiences intense weather conditions both in summer and winter seasons.
- **Temperature** – Summer season prevails from April to October. Average monthly maximum and minimum temperatures during summers are 40°C and 15°C respectively. Winter occurs from November to mid February. Average maximum and minimum temperatures during winter are 25°C and 4°C respectively.
- **Rainfall** – The area receives rainfall from monsoon winds (15 July – 15 September) and Mediterranean wind (mid December – mid January). Average annual rainfall is 550 – 680 mm.

- Data regarding temperature, precipitation and humidity is given in Table 3.1

Table 3.1 – Month wise Mean Temperatures, Precipitation and Humidity, 1961 – 90

Month	Mean Temperature °C		Precipitation (millimeters)	Relative Humidity (%)
	Maximum	Minimum		
January	19.7	5.0	33.8	66.2
February	21.6	7.7	50.0	60.2
March	26.6	12.5	60.5	53.8
April	33.0	17.7	36.5	41.9
May	38.1	22.0	31.8	32.5
June	40.5	25.8	51.9	37.2
July	35.7	25.8	237.3	62.3
August	34.4	25.3	221.2	70.8
September	35.0	23.0	77.7	65.5
October	33.1	16.6	12.2	55.6
November	27.6	9.9	9.9	62.9
December	21.5	5.7	30.4	68.9
Annual	30.6	16.4	853.2	56.2

(Source: Processing Centre, Pakistan Meteorological Department, Karachi 1961 –90).

- **Dust Storm** – Storms rarely occur in the project area.

3.2 BIOLOGICAL ENVIRONMENTS

3.2.1 Flora – The quarry site has very sparse vegetation. In the nearby areas trees like Kau or wild olive (*Olea cuspidate*), Sanatha (*Dodones viscoso*), Kikar (*Acacia arabica*), Phulahi (*Acacia modesta*), Beri (*zizyphus jajuba*) and Jand (*Prosopis specigera*) are found. The grass species which are dominant in the area are Sarilala (*Heteropogan controtus*), Khawi (*Cymbopogan jwaranncusa*), Mesquite (*Prosopis juifloro*), and Karir (*Capparis aphylla*). No forest exists in the project area.

3.2.2 Fauna – Since the area is exposed and is not covered with enough vegetation the wildlife is extremely scant in the area. Jackals, foxes, rabbits, wild boars and reptiles are found in small numbers.

3.3 SOCIO – ECONOMIC/HUMAN ENVIRONMENTS

3.3.1 Social

- **Population** – Refer to the relevant section as above.
- **Land Ownership/Lease** – The quarry sites have been allotted to D.G. Khan Cement Company Limited on lease. The recovered land will be SHAMILAT and MALKIYAT.
- **Security/Safety**
 - o D.G. Khan Cement Company Limited is conscious of the safety of its employees and equipment. Intensive efforts are being made to make all the work places safe for the employees under a regular health, safety and environment plan.
 - o Generally, the area is safe to operate. D.G. Khan Cement Company Limited has its integral security system which is functional round the clock. Factory premises, living areas, quarrying sites and the messes have adequate arrangements for safety. This will be further beefed up. The local people are peace loving. They do not involve in heinous crimes.
- **Social Cohesion/Attitude** – People in the area around the project site live according to joint family system. Their attitude is positive for the present project because of better job opportunities.
- **Food/Nutrition** – The land holdings are small and agriculture is rainfed. Under these conditions people are mostly undernourished.
- **Health**
 - o Kallar Kahar and Choa Saidu Shah have the basic medical facilities in public and private sectors. District Headquarter Hospital Chakwal is equipped with the specialists' facilities in addition to those in private sector.

- o D.G. Khan Cement Company Limited will have its medical system. Medical care from this facility will also be provided to the populace around the project area.
- **Education**
 - o The villages have schools up to secondary level both for girls and boys.
 - o Chakwal, Choa Saiden Shah and Kallar Kahar have education facilities up to Higher Secondary and above levels. There is one Cadet College in Kallar Kahar.

3.3.2 Economic

- **Income Levels** – Generally the people are poor. However, with increased job opportunities to be provided by D.G. Khan Cement Company Limited their income levels are bound to rise.
- **Land Value** – The cultivation depends on rains, therefore value of the land is not high.
- **Local Occupations and Employment** – Some of the locals are farmers. Many of them are employed in the armed forces of Pakistan. Other persons are doing labour work in Chakwal, Choa Saiden Shah, Kallar Kahar, Islamabad, Faisalabad, Lahore and Karachi etc.
- **Government's Economic Agenda** – The present policies of the Government (both Federal and Provincial) favour economic development. These policies include the liberal import policy, deregulation of state control, provision of incentives and infrastructural base.
- **Existing Industries** – No industries are located in Choa Saiden Shah and Kallar Kahar towns. However, small coal mines are found in the area.

3.3.3 Institutional

- **Institutional Activities** – There are a few governmental and non-governmental institutions in the project area.
- **Institutional Effectiveness** – The institutions are yet in infancy stage. These are not fully effective.

3.3.4 Human Use

- **Telephone** – Nationwide and international telephonic and fax linkages are available in some of the villages.
- **Water Supply** – The factory will have its own water supply system. The source of water will be own tube-wells to draw water from a depth of around 400 feet and beyond which is separate channel. It may be worth mentioning that water is plentifully available from this depth in stone fractures. It has been estimated that total water requirement on recurring basis, for the entire plant and quarry is around 10 – 15 m³/hour.
- **Electricity**
 - o Power needs will be met from the National Grid.
- **Communication Network**
 - o The quarry sites will be linked with all weather tracks.
 - o Plant site will be well linked with Chakwal, Kallar Kahar and Choa Saidu Shah.
- **Agriculture** - The project area is rainfed. No canal serves the area. Wheat, grams and oil seeds are the main crops of Rabi season. Kharif crops are sorgham and millets.
- **Livestock** – The fodders and feeds are available in small quantities. Cows and buffaloes are commonly found. Rearing of sheep and goat is another means of livelihood.

- **Quality of Life** – Most of the people are living on the marginal status of life.
- **Cultural Heritage** – The area does not boast of any significant cultural development. People follow the family/village traditions.
- **Archaeological Sites/Monuments/Relics** – No site of archaeological importance exists in the project area. However, Kallar Kahar and Choa Saidu Shah areas have some places of historical significance and shrines.