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ENVIRONMENTAL IMPACT ASSESSMENT REPORT

**CAPITAL DEVELOPMENT ZONE PVT. LTD
“DEVELOPMENT OF CAPITAL SPECIAL
ECONOMIC ZONE PROPOSED BY CAPITAL
DEVELOPMENT ZONE PRIVATE LIMITED
DISTRICT CHAKWAL”**

HTES-EIA-CKL-SEZ-13224

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HI-TECH ENVIRONMENTAL SERVICES (PVT.) LTD.



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FOR CAPITAL DEVELOPMENT ZONE PVT. LTD. | CAPITAL SPECIAL ECONOMIC ZONE





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EXECUTIVE SUMMARY

Title and Location of Project

Capital Development Zone Pvt. Ltd intends to develop an industrial estate titled as "Capital Special Economic Zone, Chakwal" over an area of 301.1600 acres, where issues of industrialists are handled and problems solved through 'One Window' operation. We expect to introduce a mix of industrial companies in Capital Special Economic Zone. It is estimated that this sector will create up to 60,000 to 70,000 jobs for the local population, earn foreign exchange through exports and save foreign exchange through import substitution.

In 2010, through the 18th Amendment to the Constitution of the Islamic Republic of Pakistan, 1973, environment became a provincial subject, empowering each province to make its own law. In 2012, Punjab adopted the Federal Act with minor amendments, calling it The Punjab Environmental Protection Act, 1997 (the "Punjab Act"). Section 12 of the Federal and Punjab Acts requires the filing of an EIA for projects that are likely to cause adverse environmental effects.

This EIA of the proposed project has been conducted in accordance with national and provincial environmental regulations and guidelines. In addition, other relevant international environmental laws and regulations (such as those of the World Bank (WB), International Finance Corporation (IFC) and Asian Development Bank (ADB)) have also been considered. At the current time, only the national and provincial environmental regulations are applicable to proposed Project. However, other relevant international environmental laws and regulations (such as those of the WB, IFC and ADB) have been considered as they may be required in the event that the proposed Project goes for lending from any international agency.

Under the CPEC special economic zone initiative a number of SEZs are being planned. However, most of these schemes will serve large scale industries, which can be located away from the population centres. The present proposal is for serving the needs of small and medium size enterprises and located near Chakwal. Being closed to Neela Dullah Interchange will facilitate the workers and communities to approach their workplace on daily basis without much of difficulty.

This EIA report provides an assessment of anticipated positive and negative environmental and social impacts of the proposed Project, along with the appropriate measures to further enhance the beneficial impacts and to mitigate any adverse impacts.

The Capital Special Economic Zone is located in District Chakwal. The google earth map showing the location of the zone is shown in Figure below and attached as **Annexure III** on A3 size.



The Special Economic Zone (SEZ) is ideally located on the Lahore-Islamabad Motorway at Neela Dullah, District Chakwal. This strategic location ensures seamless connectivity with all major cities, sea ports, and dry ports of the country through an extensive network of national highways and motorways. The proximity to the motorway facilitates efficient transportation and logistics operations, making it an attractive hub for industrial and commercial activities. Additionally, the SEZ is well-positioned to benefit from regional trade and economic corridors, further enhancing its potential as a center for investment and growth.

The proposed SEZ is spread over an area of 301.1600 acres and is planned integrate the advantages and featured resources for small & medium enterprises of Chakwal and nearby.

Name of the Proponent/Developer

This SEZ is being proposed by the Capital Development Zone Pvt. Ltd and M. Zahid Nadeem is the representative of the firm. The details are given below;

Proponent Name	Capital Development Zone Pvt. Ltd
Representative	Muhammad Zahid Nadeem
Address	13-H, Gulberg II, Lahore
Contact No.	+92 3040444440

Name of Organization Preparing the Report

Hi-Tech Environmental Services (Pvt.) Ltd. is a business entity managed by geoscientists and environmental experts. The company has the expertise of highly diversified experience and has completed a total of more than 200 environmental studies across Punjab. The consultant has a range of expertise available in following areas:

- a) Economic Geology
- b) Determination of geological exploratory techniques and mine design
- c) Preparation of feasibility reports, IEE report, EIA reports, Development Schemes &



Prospecting Scheme.

- d) Preparation of Environment Management Plans
- e) Preparation of reports on HRD /Mines Rescue & Recovery.
- f) Assessment of Impact of mining on environment and mitigating measures.
- g) Mine surveying & interpretation of boundary disputes.
- h) Legal opinion on mine regulatory regime.
- i) Energy fuels and selection of choice fuels for specific energy
- j) Drilling and blasting for underground and surface mining techniques.
- k) Safety measures for mines operation.

Contact Details	
Consultant Company	Hi-Tech Environmental Services (Pvt.) Ltd.
Address	26-B, Zahoor Elahi Road, Gulberg-II, Lahore.
Representative	Engr. Harris Naeem
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e-Mail	harris.naeem@hitecha.com

Sr.	Name	Qualifications & Brief Experience	Roles Assigned
1.	Engr. Harris Naeem	M.Sc. Mining Engineering	• Director operations • Mining Techniques
2.	Ch. Awais Ahmad	LLM (London)	• Site Visits • Legal Reviews • Coordination with Locals
3.	Razi Allah	BS Hon. Environmental Sciences	• Environmental Compliance Officer • MBA, FCCU & Cranfield UK • BS (Hons). Environmental Science & Geography (GIS), FCCU Lahore (TQM ISO 14001)
4.	Attiqa Hameed	Environmental Scientist PhD Scholar	• Preparation of Environmental Management Plan (EMP) • Preparation of Environmental Monitoring Plan (EMP) • Author of EIA Report
5.	Engr. Maryam Nazir	Mining Engineer and GIS Management B.Sc. Mining Engineering	• Development of Maps • Secondary data collection • Compilation of report • Coordination with the team



Purpose of Report

The purpose of the EIA study is to identify the possible beneficial and adverse environmental impacts of the project as presently envisaged and propose the applicable mitigation measures to be implemented during the construction and operational stages of the project in order to minimize the negative impacts and preparation of Environmental Management Plan (EMP) to obtain No Objection Certificate (NOC) from Punjab-EPA.

This EIA report has been prepared keeping in view the following regulations and guidelines:

- Pakistan Environmental Protection Act (PEPA), 1997 & Punjab Environmental Protection Act (PEPA), 2017.
- Pakistan Environmental Protection Agency Regulations, 2022 for review of IEE and EIA.
- Pakistan Environmental Impact Assessment procedures, 2022.
- Guidelines for Preparation and Review of Environmental Reports

Environmental Legislative, Regulatory and Institutional Framework

National environmental laws, regulations, guidelines and policies applicable to proposed project have been provided below:

- Pakistan Environmental Protection Act 1997 is the supreme environmental legislation in Pakistan.
- "Pak-EPA Review of IEE and EIA Regulations, 2022" make the provisions for the preparation, submission, review and approval of the Initial Environmental Examination (IEE) and the Environmental Impact Assessment (EIA) reports and post monitoring of environmental approvals by Pak-EPA. Regulations, 2022 also provide the classification of projects requiring IEE and EIA. According to the classification provided by the Regulations, 2022, the proposed project having significant environmental and social impacts, requires an Environmental Impact Assessment (EIA) to be conducted.
- Pak-EPA Policy and Procedures for Filing, Review and Approval of Environmental Assessment establish a policy context and administrative procedures for environmental assessment in Pakistan.
- Pak-EPA Guidelines for "Preparation and Review of Environmental Reports" is confined to general aspects of the environmental reports.
- Pak-EPA Guidelines for Public Consultation during IEE/EIA.
- Pak-EPA Sectoral Guidelines for Major Thermal Power Stations.
- National Environmental Institutions in Pakistan.

Pakistan Environmental Protection Agency (Pak-EPA)

Key functions of Pak-EPA are: Implementation of PEPA, 1997 i.e., to develop regulations and guidelines as referred by the Act. Review and approval of IEE and EIA reports submitted to them. In addition, Pak-EPA is mandated to prepare or revise, and establish the National Environmental Quality Standards (NEQS) with approval of Pakistan



Provincial Environmental Setup in Punjab

Punjab EPA enacted the Provincial Environmental Protection Act in November, 2017 by making appropriate amendments in PEPA, 1997. The EPA; Punjab now undertakes functions as delegated under the Punjab Environmental Protection Act, 1997.

EIA related functions are performed through Environmental Approval Section of the Punjab EPA. Environmental Protection Council (PEPC).

International Environmental Requirements

Provided below is a listing of international environmental and social requirements relevant to the proposed project.

Environmental Requirements of IFC

- IFC Sustainability Framework.
- IFC Performance Standards on Environmental and Social Sustainability.
- IFC Environment, Health and Safety (EHS) Guidelines.
- IFC's "Environmental and Social Review Procedures.

ADB Environmental Assessment Guidelines

ADB Environmental Assessment Guidelines describe how to fulfill the requirements outlined in ADB's Environment Policy and Operations Manual on Environmental Considerations in ADB Operations. Information on ADB's policies and procedures for conducting and reporting on the environmental assessment is also provided for all types of projects.

Environmental and Social Safeguard of the World Bank

The World Bank's environmental assessment policy and recommended processing are described in Operational Policy (OP)/Bank Procedure (BP) Environmental Assessment. This policy is considered to be the umbrella policy for the Bank's environmental 'safeguard policies.

Alternative Considerations

Alternatives are generally identified and analyzed to determine the most viable method of achieving the project objectives. During the recent years, environmental and social concerns related to the developmental activities, are gaining significant momentum all over the world. Therefore, besides the technical and financial considerations, it is also required to recognize the environmental and social consequences of developmental projects,

Alternatives considered in this EIA include following:

- No project option;
- Alternate technologies for Economical Zone;
- Site Alternatives, their Selection and Rejection Criteria
- Design/technology alternatives, their selection and rejection criteria



- Environmental Alternatives, their selection and rejection criteria
- Economic Alternatives, their selection and rejection criteria

Need of Environmental Assessment

The preparation and submission of an Environmental Impact Assessment (EIA) report for any development project is a statutory obligation under Punjab Environmental Protection Act, 1997 (amended, 2017) in terms of Section 12 of the Act which states as under:

"No proponent of a project shall commence construction or operation unless he has filed with the Provincial Agency, an initial environmental examination or where the project is likely to cause an adverse environmental effect, an environmental impact assessment, and has obtained from the Provincial Agency approval in respect thereof."

The current Project falls under Schedule- II of subsection H under list 5 Industrial Estate (Including Export Processing Zones) of IEE/EIA Regulation 2022 and thus requires Environmental Impact Assessment- EIA.

General Topography of the Area

The topography of the Project area near Neela Dullah interchange in District Chakwal, characterized by flat to gently undulating terrain, is generally favorable for establishing a Special Economic Zone (SEZ). The area's accessibility is enhanced by the interchange, facilitating efficient transportation of goods and services. The landscape, primarily consisting of arid plains and low hills, provides ample space for industrial development with fewer natural obstacles, simplifying the construction of necessary infrastructure. While the terrain suggests manageable construction costs, attention must be given to proper drainage and flood prevention, given the presence of seasonal streams. Overall, with appropriate planning and environmental assessments, the topography of the Neela Dullah Interchange area supports the establishment of a viable SEZ.

Approximately the area will be under industrial plots and remaining area will be dedicated for roads, infrastructure, amenities, utilities, commercial area, etc. Overall distribution/utilization is based on international standards and need assessment surveys.

Major Impacts

The development of the proposed project will have both positive and negative impacts during construction and operational phases; appropriate mitigation measures are proposed for negative impacts. Following are the major concerns and potential impacts

- Ambient air quality can get deteriorated both during pre-construction (site clearing) and construction phases of the proposed industrial state. The major contributing factors will be generation, suspension and deposition of particulate matter and gaseous emission due to vehicular movement.
- Noise levels can rise around the project site due to operation of machinery and equipment and transportation of construction materials etc.
- Construction waste, if not managed properly, can have negative impacts on the site and surrounding area
- Poor maintenance of vehicles, machinery and generator can cause increased noise levels as well as gaseous emissions



- Wastewater, if disposed of without any prior treatment, can cause surface and groundwater contamination.
- Oil spillages from construction machinery can result into soil and water contamination
- There will always be the possibility regarding hazard to health and safety of workers to occur during construction and operational phases of the proposed project.
- Local residents will be preferred for employment in the proposed industrial state and thus it will have a positive impact on the local economy and regional

Recommendations for Mitigation Measures

All the potential impacts of the proposed project should be prevented through appropriate measures and if happen, they should be properly mitigated. Appropriate mitigation measures have been suggested after this EIA study and a comprehensive Environmental Management and Monitoring Plan (EMMP) has been formulated and given in this EIA study. The execution of EMP will help to reduce the adverse impacts of the proposed project. Thus, the project should be made environment friendly by implementing this Environmental Management & Monitoring Plan (EMMP) with fidelity.

Proposed Monitoring

The environmental performance of the proposed project should be overseen through proper monitoring during its construction and operational phases. The Environmental Monitoring Plan should be enforced during the project lifecycle to ensure effective surveillance of the environmental parameters at various stages of the project development and compliances with NEQS and legal obligations. Following parameters should be monitored;

- Ambient air quality should be monitored as per EPA NEQS Rules 2001
- Monitoring for noise level should be conducted as per EPA NEQS Rules 2001
- Monitoring for waste water & drinking water quality should be conducted as per EPA NEQS Rules 2001

The proponent shall be responsible for environmental monitoring and reporting throughout project life and assure proper implementation of mitigation measures, where needed, through adequate monitoring.

Conclusions and Recommendations

The development of the proposed industrial zone in the region will contribute towards the economy of the country to a greater extent. Also, industrialization generates employment opportunities, provides educational opportunities, encourages advancement and innovation, and better utilizes resources. All of these benefits and more make industrial development extremely valuable to a population and the local economy.

Apart from the beneficial impacts of the project, the proposed project can also have adverse environmental impacts during all phases. Most of the impacts during construction are of a temporary nature. These potential impacts can be avoided or mitigated by adopting suitable mitigation or remedial measures as mentioned in this EIA Report.

Following are the recommendations based upon this EIA Study:



- Proposed mitigation measures for potential environmental impacts should be implemented to avoid/ minimize those impacts.
- Tree plantation plan should be followed.
- Proper implementation of EMMP should be ensured during all three phases of the proposed project.
- Training programs should be arranged and all working personnel and contractors should be given appropriate training prior to construction to ensure they are aware of the onsite responsibilities in respect of all environmental and social issues.
- EMMP should be made a part of contract document of Contractor and executed properly.

Environmental and Social Impact and Mitigation Measures

Potential impacts described in this EIA are primarily caused by changes to the existing socioeconomic and bio physical environment brought on by the proposed project and thus should be interpreted in conjunction with the sections of the report addressing these biophysical and socio-economic dimensions.



Table: Environmental and Social Impacts of the Proposed Project

Subject Area		Potential Impacts During Construction	Potential Impacts During Operation	Mitigation
Physical Environment	Air Quality	- Dust from construction activities. - Traffic-related air quality impacts.	- Effects of stacks emissions on ambient air quality. - Traffic-related air quality impacts. - Green House Gas emissions	- Watering of the material stockpiles, access roads and bare soils on an as required basis to minimize dust. - Increase the watering frequency during periods of high risk (e.g. high winds). - Stored materials such as gravel and sand should be covered and confined - Vehicles with appropriate exhaust systems will be used. - Maintenance of all vehicles on regular basis. - Establish and implement vehicle speed limits to minimize dust generation - Cover haul vehicles transporting dusty materials (cement, borrow) moving outside the construction site - Use of specified haulage routes and reduce vehicle speed where required.
	Water Resources	- Control and management of site drainage. - Wastewater discharge, Sewage disposal and foul drainage	- Water requirements for operation - Discharge of process and wastewater.	Stockpiles of potential water pollutants (i.e. oils, construction materials, fuel, etc.) shall be placed so as to minimize the potential of contaminants to enter local watercourses or storm-water drainage.



		Effects on groundwater quality.	- Operation of drainage systems on site. - Discharge of storm water, sewage and drainage	- Preparation of Emergency Spills Contingency Plan. - Storm-water runoff from all fuel and oil storage areas, workshop, and vehicle parking areas is to be directed into an oil and water separator before being discharged to any watercourse
	Soils, Geology and Topography	- Effects on soils and topographic features. - Soil contamination	Soil contamination during the project activities.	- Ensure the topography of the final surface of all raised lands are favorable to enhance natural draining of rainwater / flood water - Restore the natural landscape of the construction sites after completion of work
	Land Use, Landscape and Visual Issues	- Impacts on existing land use on site. - Impacts on existing land use in the surrounding area. - Effects of construction activities on landscape character. - Visual impact of construction activities.	- Impacts on existing land use on site. - Impacts on existing land use in the surrounding area. - Effects on landscape character. - Visual impact of operating facilities.	- Stop work and inform the site manager immediately if, during construction, an archaeological or burial site is discovered. - It is an offence to restart work in the vicinity of the site until approval to continue is awarded by the plant management. - Resolve landscape change issue in consultation with local leaders and supervision consultants.
Ecological Environment	Flora	Loss of natural vegetation and crops	Impacts on flora due to altered drainage and runoff patterns	- Removal of trees should be limited to the development footprint - Construction activities shall reduce the loss or disturbance of vegetation - Use clear areas to avoid cutting of trees - A procedure shall be prepared to manage vegetation removal, clearance and reuse - Inform the plant management before clearing trees



Fauna	• Losses of habitat or species due to land take. • Disturbance or damage to adjacent habitat of species	• Disturbance or damage to adjacent habitat • Effects on birds migration routes	• Project should ensure the safety of various animals in construction and operation camp area.
Economy Related Impacts	• Impacts on local skilled and un-skilled labor and businesses.	• Impacts on local labor and businesses	• The increased government revenue could be used to meet objective by improving infrastructure and services in areas local to the project.
Social Settings and Services Related Impacts	• Demographic changes due to influx of people. • Pressure on existing infrastructure, utilities and services.	• Small scale demographic and cultural changes.	• Safe, reliable water supply, Sufficient housing for all. • Treatment facilities for sewerage of toilet and domestic wastes • In-house-community entertainment facilities.



	Public Health Related Impacts	- Traffic congestions and disruption to road users - Health impacts due to construction related dust and air emissions and wastewater/effluents release - Traffic-related air quality. - Traffic-related noise	- Health impacts due to air emissions and noise and effluents released. - Traffic-related air quality impacts. - Traffic-related noise impacts.	- Implement proper safety standards. - Provide personal protection equipment (PPE) for staff, such as safety shoes, helmets, masks, gloves, protective clothing, goggles, full—face eye shields, and ear protection. - Maintain the PPE under a regular checking and replacement program. - Provide safe and healthy work environment to workers, taking into account inherent risks in its particular construction activity and specific classes of hazards in the work areas.
	Occupational Health safety	- Accidents. - Effects on health of workforce. Safety at work.	- Accidents. - Effects on health of workforce. - Safety at work.	- A traffic management plan will be developed by the construction contractor to prevent incidents of accidents which may occur due to transportation of machinery and equipment to the project site. - Undertake a full project community risk assessment followed by the development of a community emergency preparedness and response plan appropriate to its findings
	National and Regional Impacts	- Human resources development. - Economic development at regional and national level	- Industrial development in Punjab and Pakistan - National and regional (Punjab) power cities - Impacts on regional and national air quality	The increased government revenue could be used to meet development objective by improving infrastructure and services in areas local to the project



	Global impacts	• Purchase of equipment and machinery from global markets • Hiring the international contractors and consultants	• Green-house gas emission and climate change • Impacts on global air quality and global warming	• Maintenance of all construction machinery on regular basis • Use of machinery with appropriate exhaust system • In order to control the particle emission all stages filtering system, duct collectors or humidification or other techniques(as applicable) to the concrete batching and mixing plant will be provided.
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1. INTRODUCTION

1.1 Purpose of the Report

This EIA of the proposed project has been conducted in accordance with national and provincial environmental regulations and guidelines. In addition, other relevant international environmental laws and regulations (such as those of the World Bank (WB), International Finance Corporation (IFC) and Asian Development Bank (ADB)) have also been considered. At the current time, only the national and provincial environmental regulations are applicable to proposed Project. However, other relevant international environmental laws and regulations (such as those of the WB, IFC and ADB) have been considered as they may be required in the event that the proposed Project goes for lending from any international agency identification of the Project and Proponent.

This project represents a new and significant development in the vicinity of the Neela Dullah Interchange, aimed at transforming the area into a thriving Special Economic Zone (SEZ). Leveraging the strategic location and favorable topography, this initiative is set to boost local economic activity, create jobs, and attract investment, thereby contributing to the overall growth and development of District Chakwal. Yet, there is a dire need of industry specific area where the enterprises can establish or extend their businesses. The Industrial growth is essential for the overall Gross Domestic Product (GDP) and helps in earning foreign exchange, substitute imports and create jobs.

Considering these essentials, the Government of Pakistan is incentivizing the establishment of Industrial Parks and decided to give them Special Economic Zone (SEZ) status after fulfilling certain requirements. The developers of these SEZs and the enterprises establishing their businesses in the SEZs have been promised certain incentives so that the industrialization is promoted in the country. To facilitate further the Government has promulgated SEZ Act 2013, for the creation, development and efficient operation of special economic zones to encourage domestic and international investors for promotion and establishment of industrial infrastructure and for other matters connected or ancillary thereto.

The Government of Pakistan has announced a comprehensive and a business-friendly incentive package aimed to upscale investments, promote the industry and employment; strengthen and form new industry clusters as well as promote exports of goods and services. It is estimated that this sector will create up to 60,000 to 70,000 jobs for the local population, earn foreign exchange through exports and save foreign exchange through import substitution.

Under the CPEC special economic zone initiative a number of SEZs are being planned. However, most of these schemes will serve large scale industries, which can be located away from the population centers. The present proposal is for serving the needs of small and medium size enterprises and located near Neela Dullah Interchange. Being closed to Motorway will facilitate the workers and communities to approach their workplace on daily basis without much of difficulty.



This EIA report provides an assessment of anticipated positive and negative environmental and social impacts of the proposed Project, along with the appropriate measures further enhance the beneficial impacts and to mitigate any adverse impacts.

The purpose of the EIA study is to identify the possible beneficial and adverse environmental impacts of the project as presently envisaged and propose the applicable mitigation measures to be implemented during the construction and operational stages of the project in order to minimize the negative impacts and preparation of Environmental Management Plan (EMP) to obtain No Objection Certificate (NOC) from Punjab-EPA.

This EIA report has been prepared keeping in view the following regulations and guidelines:

1. Pakistan Environmental Protection Act (PEPA), 1997 & Punjab Environmental Protection Act (PEPA), 2017.
2. Pakistan Environmental Protection Agency Regulations, 2022 for review of IEE and EIA.
3. Pakistan Environmental Impact Assessment procedures, 2022.
4. Guidelines for Preparation and Review of Environmental Reports

1.2 Need of Environmental Assessment

The preparation and submission of an Environmental Impact Assessment (EIA) report for any development project is a statutory obligation under Punjab Environmental Protection Act, 1997 (amended PEPA, 2017) in terms of Section 12 of the Act which states as under:

"No proponent of a project shall commence construction or operation unless he has filed with the Provincial Agency, an initial environmental examination or where the project is likely to cause an adverse environmental effect, an environmental impact assessment, and has obtained from the Provincial Agency approval in respect thereof."

The current Project falls under Schedule- II of subsection H under list 5 Industrial Estate (Including Export Processing Zones) of IEE/EIA Regulation 2022 and thus requires Environmental Impact Assessment- EIA.

1.3 Details of the Proponent

This SEZ is being proposed by the Capital Development Zone Pvt. Ltd and M. Zahid Nadeem is the representative of the firm. The details are given below;

Table 1-1 Details of the Proponent

Proponent Name	Capital Development Zone Pvt. Ltd
Representative	Muhammad Zahid Nadeem
Address	13-H, Gulberg II, Lahore
Contact No.	+92 3040444440

1.4 Details of Consultant

Hi-Tech Environmental Services (Pvt.) Ltd. is a business entity managed by geoscientists and environmental experts. The company has the expertise of highly diversified experience and has



completed a total of more than 200 environmental studies across Punjab. The consultant has a range of expertise available in following areas:

- l) Economic Geology
- m) Determination of geological exploratory techniques and mine design
- n) Preparation of feasibility reports, IEE report, EIA reports, Development Schemes & Prospecting Scheme.
- o) Preparation of Environment Management Plans
- p) Preparation of reports on HRD /Mines Rescue & Recovery.
- q) Assessment of Impact of mining on environment and mitigating measures.
- r) Mine surveying & interpretation of boundary disputes.
- s) Legal opinion on mine regulatory regime.
- t) Energy fuels and selection of choice fuels for specific energy
- u) Drilling and blasting for underground and surface mining techniques.
- v) Safety measures for mines operation.

Table 1-2 Details of the Consultant

Contact Details	
Consultant Company	Hi-Tech Environmental Services (Pvt.) Ltd.
Address	26-B, Zahoor Elahi Road, Gulberg-II, Lahore.
Representative	Engr. Harris Naeem
Contact	(+92) 304 0444440
e-Mail	harris.naeem@hitechma.com

The team carrying out the research project is presented in the Table 1-3.

Table 1-3 Project Team

Sr.	Name	Qualifications & Brief Experience	Roles Assigned
1.	Engr. Harris Naeem	M.Sc. Mining Engineering	● Director operation ● Mining Techniques
2.	Ch. Awais Ahmad	LLM (London)	● Site Visits ● Legal Reviews ● Coordination with Locals
3.	Razi Allah	BS Hon. Environmental Sciences	● Environmental Compliance Officer ● MBA, FCCU & Cranfield UK ● BS (Hons). Environmental Science & Geography (GIS), FCCU Lahore (TQM ISO 14001)
4.	Attiqa Hameed	Environmental Scientist PhD Scholar	● Preparation of Environmental Management Plan (EMP) ● Preparation of Environmental Monitoring Plan (EMP) ● Author of EIA Report
5.	Engr. Maryam Nazir	Mining Engineer and GIS Management B.Sc. Mining Engineering	● Development of Maps ● Secondary data collection ● Compilation of report ● Coordination with the team



1.5 Brief Description of the Project

Capital Development Zone Pvt. Ltd intends to develop an industrial estate titled as “Capital Special Economic Zone, Chakwal” over an area of 301.1600 acres, where issues of industrialists are handled and problems solved through ‘One Window’ operation. We expect to introduce a mix of industrial companies in Capital Special Economic Zone. It is estimated that this sector will create up to 60,000 to 70,000 jobs for the local population, earn foreign exchange through exports and save foreign exchange through import substitution.

The fiscal benefits under the SEZ law include a one-time exemption from custom duties and taxes for all capital goods imported into Pakistan for the development, operations and maintenance of a SEZ (both for the developer as well as for the zone enterprise) and exemption from all taxes on income for a period of ten years.

The Neela Dullah Interchange area boasts commendable accessibility from prominent locations, essential for its potential as a Special Economic Zone (SEZ). Positioned approximately 40 kilometers from the bustling town of Chakwal, it offers a vital link for efficient transportation via well-maintained roads. Furthermore, its strategic location places it within a reasonable distance from major cities like Islamabad and Rawalpindi, approximately 100 kilometers away, ensuring access to broader markets and transportation networks. Moreover, its connectivity to national highways and motorways facilitates seamless transportation of goods and services across the country, with distances to these vital arteries ranging from 5 to 10 kilometers. This strategic positioning, coupled with its relative proximity to key urban centers and transportation routes, renders the Neela Dullah Interchange area highly accessible, making it an attractive prospect for industrial development and economic growth.

The master plan of Capital Special Economic Zone, Chakwal is given in Figure 1-1 and attached as **appendix IX**.

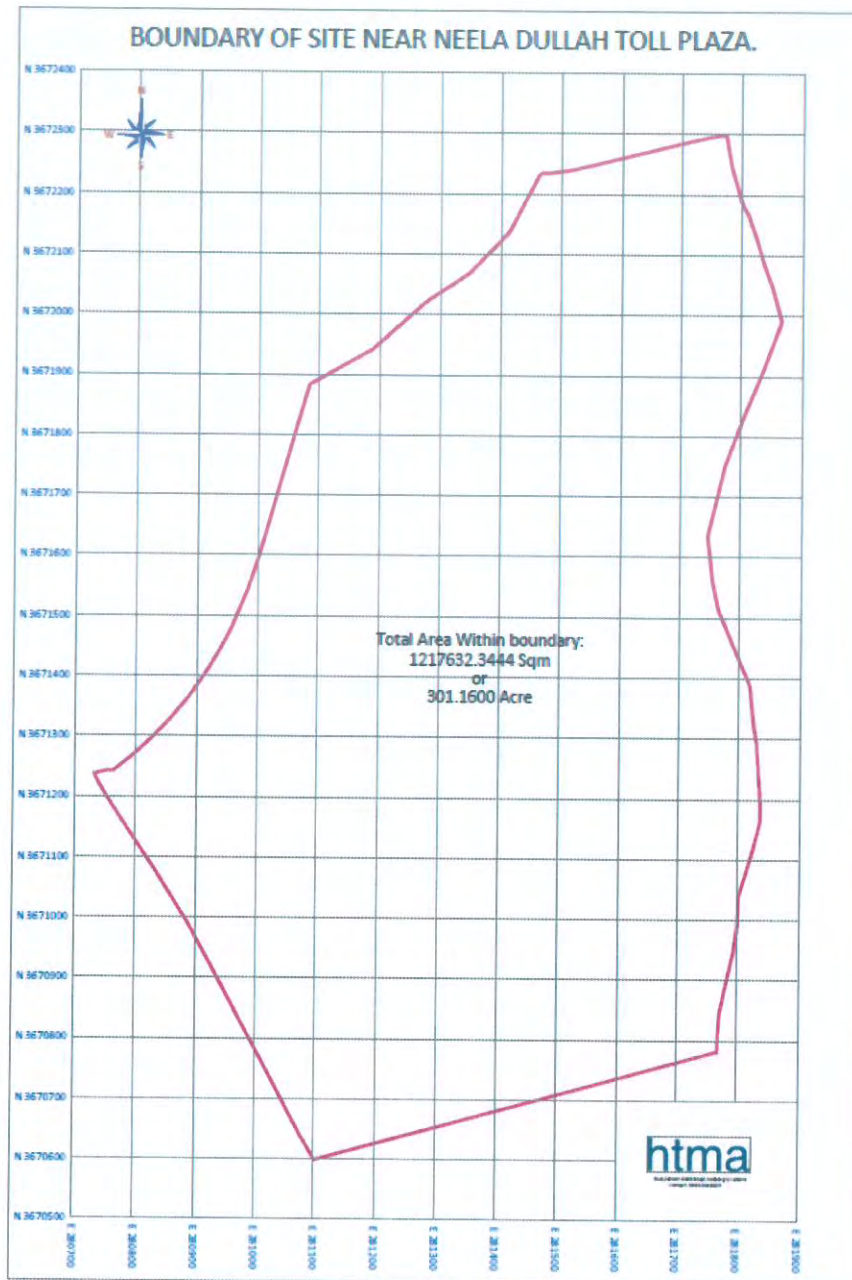


Figure 1-1 Master Plan of the Project



The proposed area will be covered under;

- Industrial plots
- Roads, infrastructure, amenities, utilities,
- commercial area, etc.

Overall distribution/utilization is based on international standards and need assessment surveys.

1.6 Types of Industries High Potential Sector for following industries in SEZ

- Manufacturing Services
- Warehousing
- Information Technology
- Textile
- Light Engineering
- Auto parts
- Plastic Industry
- Pharmaceuticals
- Chemicals
- Electronics
- Food & Beverages
- Mobile Manufacturing

1.7 Alternative Considerations

Alternatives are generally identified and analyzed to determine the most viable method of achieving the project objectives. During the recent years, environmental and social concerns related to the developmental activities, are gaining significant momentum all over the world. Therefore, besides the technical and financial considerations, it is also required to recognize the environmental and social consequences of developmental projects,

Alternatives considered in this EIA include following:

- No project option;
- Alternate technologies for Economical Zone;
- Site Alternatives, their Selection and Rejection Criteria
- Design/technology alternatives, their selection and rejection criteria
- Environmental Alternatives, their selection and rejection criteria
- Economic Alternatives, their selection and rejection criteria



2. ENVIRONMENTAL LEGISLATIVE, REGULATORY AND INSTITUTIONAL FRAMEWORK

This Chapter presents information on the national and provincial (Punjab) legislation, regulation and guidelines applicable to the proposed Project. In addition, this Chapter also provides information on other relevant international environmental laws, regulations and guidelines (such as those of the WB, IFC and ADB).

At the current time, only the national and provincial environmental regulations are applicable to proposed Project. However, other relevant international environmental laws and regulations (such as those of the WB, IFC and ADB) have been considered as they may be required in the event that the proposed Project goes for lending from any international agency.

The preparation and submission of an Environmental Impact Assessment (EIA) report for any development project is a statutory obligation under Punjab Environmental Protection Act, 1997 (amended PEPA, 2017) in terms of Section 12 of the Act which states as under:

"No proponent of a project shall commence construction or operation unless he has filed with the Provincial Agency, an initial environmental examination or where the project is likely to cause an adverse environmental effect, an environmental impact assessment, and has obtained from the Provincial Agency approval in respect thereof."

The current Project falls under Schedule- II of subsection H under list 5 Industrial Estate (Including Export Processing Zones) of IEE/EIA Regulation 2022 and thus requires Environmental Impact Assessment- EIA

2.1. National Requirements

2.1.1. Background

Pakistan's Environmental Policy is based on participatory approach to achieving objectives of sustainable development through legally, administratively and technically sound institutions. In 1975, the Federal Environment Ministry was established in Pakistan as follow up to Stockholm declaration of 1972. The Ministry is responsible for promulgation of the **Environmental Protection Ordinance of Pakistan, 1983**. This was the first comprehensive legislation prepared in the country. The main objective of Ordinance was to establish institutions (i.e. to establish Federal and Provincial Environmental Protection Agencies (EPAs) and Pakistan Environmental Protection Council (PEPC)).

In 1992 Pakistan attended the Earth Summit in state of Brazil (Rio-De Janeiro) and thereafter became party to various international conventions and protocols. This political commitment augmented the environmental process in the country. In the same year, Pakistan prepared the **National Conservation Strategy (NCS)** which provides a broad framework for addressing environmental concerns in the country.

In 1993 National Environmental Quality Standards (NEQS) were designed.

In December 1997, the Pakistan Environmental Protection Act (PEPA) was enacted, repealing the Environmental Protection Ordinance of Pakistan, 1983.

Further discussion is provided below regarding national environmental laws, regulations and guidelines applicable to proposed Project.



2.1.2. Pakistan Environmental Protection Act (PEPA), 1997

The Pakistan Environmental Protection Act (PEPA) is the supreme environmental legislation in the country. PEPA provides for:

- The establishment of Pakistan Environmental Protection Council (PEPC);
- The framework for implementation of NCS;
- The establishment of Federal and Provincial Environmental Protection Agencies;
- The establishment of Provincial sustainable development funds;
- The protection and conservation of species;
- The conservation of renewable resources;
- The establishment of environmental tribunals and appointment of Environmental Magistrates; and,
- Initial Environmental Examination¹⁵ and Environmental Impact Assessment

Following sections and sub-sections of PEPA deal with the IEE and EIA:

- **Section 12** provides the requirement for environmental assessment. Section 12 provides that no proponent of a project shall commence construction or operation unless he has filed with the Federal Agency for an Initial Environmental Examination (IEE) or Environmental Impact Assessment (EIA) and has obtained approval from Environmental Protection Agency (EPA).
- **Section 17(1)** provides the penalties for non-compliance to section 12 and other sections of the PEPA.
- **Section 22** provides for the appeals to environmental tribunals against any order of federal or provincial EPA.
- **Section 26** provides the delegation of powers by federal agency to any provincial government, provincial agency, local council or local authority.
- **Section 33(2)(f)** provides for the regulations to categorize the projects for IEE and EIA.
- **Section 33(2)(g)** provides that federal agency may issue guidelines for preparations of IEEs and EIAs, and development of procedures for filing and review of IEEs and EIAs.
- **Section 33** provides to make regulations by notification in official gazette and with approval from federal government.

2.1.3. Pak-EPA, Policy and Procedures for Filing, Review and Approval of Environmental Assessment

Purpose of Pak-EPA, Policy and Procedures for Filing, Review and Approval of Environmental Assessment is to establish a policy context and administrative procedures for environmental assessment in Pakistan.

According to this policy, federal EPA has jurisdiction to IEE and EIA for the following types of projects:

- Projects on federal land;
- Military projects;



- Projects with trans-country impacts;
- Projects with trans-province impacts and;
- Projects for which there is some agreement between federal and provincial EPAs.

Provincial EPAs are responsible authorities for all other projects under their respective provincial jurisdictions.

In 2010, through the 18th Amendment to the Constitution of the Islamic Republic of Pakistan, 1973, environment became a provincial subject, empowering each province to make its own law (except for the Islamabad Capital Territory (ICT) or areas in the federation not included in any province).

In 2017, Punjab adopted the PEPA with minor amendments, calling it The Punjab Environmental Protection Act, 1997. Punjab EPA is the responsible authority for proposed Project.

2.1.3. Pak-EPA, Guidelines for Preparation and Review of Environmental Reports

The scope of Pak-EPA, Guidelines for Preparation and Review of Environmental Reports is confined to general aspects of the environmental reports. For the specific environmental issues, sector specific guidelines are issued time to time by Pak-EPA. This guideline specifically provides, in terms of the general aspects:

- Process of commencing environmental assessment including major steps of environmental assessment and format of the IEE / EIA;
- Process and procedures of impact assessment;
- Mitigation and management for identified impacts;
- Reporting;
- Reviewing of environmental reports and decision making;
- Monitoring and auditing by EPA; and,
- Project Management.

The **Appendix A** of the guidelines provides the global, cross-sectoral and cultural issues related to IEE and EIA.

2.1.4. Pak-EPA, Guidelines for Public Consultation during IEE / EIA

Pak-EPA, Guidelines for Public Consultation during IEE / EIA, provide:

- Stakeholder identification and objectives of stakeholder involvement in IEE / EIA process;
- The methods and techniques of effective public participation during IEE / EIA process;
- Consensus building and dispute resolution among project proponent and affected communities and other stakeholders; and,
- Facilitation for stakeholder involvement.

The IEE /EIA decision making process in Pakistan is shown in Figure 2-1.

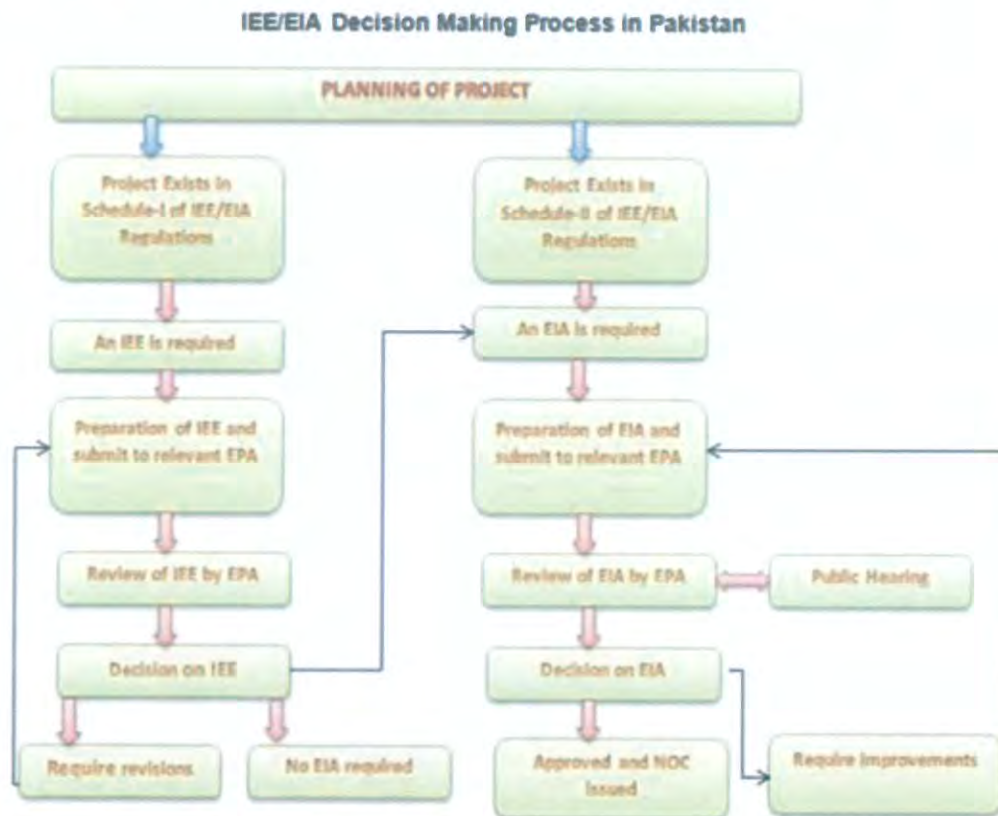


Figure 2-1: IEE/EIA Process of the Project

2.1.5. National Environmental Quality Standards

The National Environmental Quality Standards (NEQS) have been promulgated under the PEPA. The ones relevant to the proposed Project are provided in the following Exhibits:

- **Exhibit 2-1:** NEQS for Municipal and Liquid Industrial Effluents.
- **Exhibit 2-2:** National Environmental Quality Standards for Gaseous Emissions.
- **Exhibit 2-3:** Standards for Motor Vehicle Exhaust and Noise.
- **Exhibit 2-4:** Standards for Ambient Air Quality.
- **Exhibit 2-5:** Standards for Ambient Noise.
- **Exhibit 2-6:** Standards for Drinking Water.

At the current time, only the national and provincial environmental regulations (i.e. the NEQS) are applicable to proposed Project. However, other relevant international environmental laws and regulations (such as those of the WB, IFC and ADB) have been considered as they may be required in the event that the proposed Project goes for lending from any international agency.

2.1.6. National Environmental Institutions in Pakistan

A brief account of environmental institutions in Pakistan is provided in this section



2.2.1. Federal Ministry of Climate Change

The Federal Ministry of Climate Change is the apex level institution in Pakistan dealing with matters of environment and climate change. The Ministry comprises five wings / sections:

- Administration Wing;
- Development Wing;
- Forestry Wing;
- International Cooperation Wing; and,
- Environment Wing

The Environment Wing deals with national and international environmental matters. The Pak-EPA is closely linked with the Federal Ministry of Climate Change.

2.2.2. Pakistan Environmental Protection Council (PEPC)

The Pakistan Environmental Protection Council (PEPC) was constituted in 1984 under Section 3 of the Environmental Protection Ordinance of Pakistan, 1983. The PEPC is headed by the Prime Minister of Pakistan and contains representatives from: trade and industry; leading NGOs; educational intuitions; expert journalists; and, and concerned ministries.

The key function of the PEPC is to co-ordinate and supervises the enforcement of PEPA. Other functions include:

- Approval of national environmental policies, and ensuring their implementation;
- Approval of the National Environmental Quality Standards (NEQS);
- Provision of guidelines for the protection and conservation of species, habitats and biodiversity in general, and for the conservation of renewable and non-renewable resources; and
- Co-ordination of the integration of the principles and concerns of sustainable development into national development plans and policies.

2.2.3. Pakistan Environmental Protection Agency (Pak-EPA)

Pakistan Environmental Protection Agency (Pak-EPA) was established under Section (5) of PEPA. The basic function of Pak-EPA is the implementation of the PEPA and development of associated regulations and guidelines.

Other functions of Pak-EPA are as follows:

- Review of IEE and EIA reports of relevant projects and environmental approvals granted;
- Issue of certificates for establishment of environment labs in the Islamabad Capital Territory;
- Preparation (or revision) and establishment of provincial Environmental Quality Standard (EQS) with approval of Pakistan Environmental Protection Council (PEPC);



- Promotion of research and the development of science and technology which may contribute to the prevention of pollution, protection of the environment, and sustainable development; and,
- Identification of the needs for, and initiation of, legislation in various sectors of the environment.

2.2.4. 18th Amendment to the Constitution of the Islamic Republic of Pakistan

In 2010, through the 18th Amendment to the Constitution of the Islamic Republic of Pakistan, 1973, environment became a provincial subject, empowering each province to make its own law (except for the Islamabad Capital Territory (ICT) or areas in the federation not included in any province).

2.2.5. Status of PEPA after 18th Amendment

In the light of provisions of 18th Amendment:

- PEPA can be repealed or amended to make it applicable to a particular province, through a Provincial Act enacted by the Provincial Assembly concerned; and,
- PEPA shall continue to remain in force until repealed or amended by the competent authority, which is now the Provincial Assembly in respect of each Province and Parliament in respect of the ICT / areas in the federation not included in any province.

At present, under the provisions of 18th Amendment, almost all provinces of Pakistan have enacted their own Provincial Environmental Protection Act by making appropriate amendments to PEPA.

2.2.6. Status of Pak-EPA Rules and Regulations after 18th Amendment

According to the 18th Amendment, powers to make rules and regulations have been delegated to the provinces.

2.2.7. Pak-EPA, Review of IEE and EIA Regulations, 2022

Powers relating to review of IEE and EIAs have been delegated to the Provinces except for the:

- Military projects;
- Projects with trans-country impacts; and,
- Projects with trans-province impacts.

2.2.8. Environmental Quality Standards

Under the 18th Amendment, the power to prepare, establish and revise the Environmental Quality Standards (EQS), have been delegated to provincial EPAs. Now provincial EPAs can prepare, establish and implement the EQS with approval from Provincial Environmental Protection Council.



As mentioned earlier, Punjab EPA is the responsible authority for proposed Project.

2.2.9. Provincial Environmental Setup in Punjab

On 31 December 1983, under the Environmental Protection Ordinance of Pakistan, 1983, a provision was made for the establishment of a Provincial Environmental Protection Agency.

In 1985, the Federal Government was requested to delegate powers of the Agency to the Housing Physical and Environmental Planning (HP&EP) Department. On 1 July 1987, the Punjab EPA was formed.

On 31 December 1996, a separate administrative unit, Environment Protection Department (EPD) was formed under the Government of the Punjab. EPA Punjab was then detached from the HP&EP Department and now works as functional unit under the EPD.

Punjab EPA enacted the Provincial Environmental Protection Act in November 2017 by making appropriate amendment to the PEPA. The Punjab EPA now undertakes functions as delegated under the Punjab Environmental Protection Act 1997.

EIA related functions are performed through Environmental Approval Section of the Punjab EPA. The main functions of Environmental Approval Section are

- To review the IEE / EIA reports;
- To conduct the public hearing in EIA cases;
- To issue the environmental approvals;
- To monitor the conditions of the environmental approvals; and,
- To initiate the required actions against the proponents in case of non- compliance of conditions of the environmental approvals.

2.3. Other National and Provincial Legislation Applicable to the Proposed Project

Besides the environmental laws and regulations of Pakistan and Punjab province, proposed Project also has certain obligations under various national and provincial laws and regulations. These are discussed in this section.

2.3.1. Land Acquisition Act, 1894

The Land Acquisition Act (LAA) of 1894, which has been amended from time to time, has been the de-facto policy governing land acquisition and compensation issues in the country. The LAA is the most commonly used law for land acquisition and other properties for development projects. It comprises of 55 Sections pertaining to: area notifications and surveys; acquisition; compensation and distribution of awards; and, disputes resolution, penalties and exemptions.

Any land acquisition for the proposed Project will follow the procedures defined in the LAA. If required, certain additional procedures (as defined by the international best practice, such as WB Operational Policy on Resettlement – OP 4.12) will also be followed.



2.3.6. Punjab Factories Act 1934 (Amended 1940)

The clauses relevant to the proposed Project are those addressing the health, safety and welfare of the workers, disposal of solid waste and effluents, as well as damage to private and public property. The Act also provides regulations for handling and disposing toxic and hazardous substances.

The PEPA supersedes parts of this Act pertaining to environment and environmental degradation

2.3.7. Explosives Act 1884

The Explosives Act 1884 provides regulation for the manufacture, possession, use, sale, transport, import and export of explosives. Under this Act, project developers (and contractors) are bound on safe handling, transportation and using explosives during construction of proposed Project.

2.3.8. Employment of Child Act 1991

The Employment of Child Act 1991 disallows the use of child labor in the country. The Act defines a child as a person who has not completed his / her fourteenth year of age. The Act states that no child shall be employed or permitted to work in any of the occupation set forth in the Act (such as transport sector, railways, construction, and ports) or in any workshop wherein any of the processes defined in the Act are undertaken. Under this Act, project developers (and contractors) are not permitted to allow any child labor during the construction and operation of proposed Project.

2.3.9. Pakistan Penal Code 1860

Pakistan Penal Code 1860 deals with the offences where public or private property or human lives are affected due to intentional or accidental misconduct of an individual or organization. The Code also addresses control of noise, noxious emissions and disposal of effluents. Most of the environmental aspects of the Code have been superseded by the PEPA.

2.3.10. Punjab Power Policy 2009

Salient features of Punjab Power Policy, 2009 are as below:

- Punjab Power Policy is applicable for the development of all types of technologies such as coal, biomass, hydro, solar and wind;
- Concessions in duties / tax regime announced by Government of Pakistan are applicable for projects developed under the Policy;
- Standard format of Power Purchase Agreement (PPA), Implementation Agreement (IA) and Water Usage Agreement (WUA) are available in Policy;
- Dispersal of power is allowed in 3 modes: (i) Sale to utility company (WAPDA / DISCO); (ii) Sale to local area by establishing distribution network; and, (iii) Sale to dedicated industry (Self Utilization);



- Use of Government land is allowed in two modes: (i) Lease; and, (ii) Equivalent Equity participation;
- Projects may be developed in private Sector / JV mode; and,
- Mode of investment for thermal is normally "Build, Own and Operate" basis (BOO) with concession period of 30 years.

2.4. International Environmental Requirements

This section discusses other relevant international environmental laws, regulations and guidelines (such as those of the WB, IFC and ADB). As mentioned earlier, international environmental laws and regulations (such as those of the WB, IFC and ADB) have been considered as they may be required in the event that the proposed Project goes for lending from any international agency.

2.4.1. Environmental and Social Requirements of the World Bank

Environmental Assessment is one of the 10 environmental, social, and legal Safeguard Policies of the World Bank. Environmental Assessment is used in the World Bank to identify, avoid, and mitigate the potential negative environmental impacts associated with Bank lending operations. In World Bank operations, the purpose of Environmental Assessment is to improve decision making, to ensure that project options under consideration are sound and sustainable, and that potentially affected people have been properly consulted.

The World Bank's environmental assessment policy and recommended processing are described in Operational Policy (OP) / Bank Procedure (BP) 4.01: Environmental Assessment. This policy is considered to be the umbrella policy for the Bank's environmental 'safeguard policies.

2.4.2. Environmental and Social Requirements of IFC

The following section provides a brief summary of the environmental and social requirements of the IFC.

2.4.3. IFC Sustainability Framework

IFC's Sustainability Framework is aimed to ensure the IFC commitment to sustainable development and reflects the Corporation's approach to risk management. The Sustainability Framework comprises IFC's Policy and Performance Standards on Environmental and Social Sustainability, and IFC's access to Information Policy. The Policy on Environmental and Social Sustainability describes IFC's commitments, roles, and responsibilities related to environmental and social sustainability

2.4.4. IFC Performance Standards on Environmental and Social Sustainability

IFC's Performance Standards on Environmental and Social Sustainability define the responsibilities of IFC clients for managing their environmental and social risks. The Performance Standards are:

- **Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts.**



- **Performance Standard 2:** Labor and Working Conditions.
- **Performance Standard 3:** Resource Efficiency and Pollution Prevention.
- **Performance Standard 4:** Community Health, Safety, and Security.
- **Performance Standard 5:** Land Acquisition and Involuntary Resettlement.
- **Performance Standard 6:** Biodiversity Conservation and Sustainable Management of Living Natural Resources.
- **Performance Standard 7:** Indigenous Peoples.
- **Performance Standard 8:** Cultural Heritage.

Performance Standard 1 applies to all projects that have environmental and social risks and impacts.

2.4.5. IFC Environment, Health and Safety (EHS) Guidelines

The IFC EHS Guideline are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP), as defined in IFC's Performance Standard 3 on Pollution Prevention and Abatement. These Guidelines are used as a technical source of information during project appraisal activities.

2.4.6. IFC Environmental and Social Review Procedures

IFC investment timing in relation to a client's business activities and project implementation varies from project to project. IFC does not control the timing of its entry into a project, however IFC's engagement, more often than not, occurs after the project is conceived, with the site selected and development started.

Therefore, IFC's approach is, whenever possible, to take full advantage of assessment work undertaken by the client before IFC's entry into the transaction and where necessary strengthening environmental assessment (EA) analysis without replicating processing requirements. Of particular importance is the adequacy of the client's Environmental and Social Management System.

Whenever IFC makes an investment in a project, following environmental and social review procedures are adopted:

- Conduct due diligence of the proposed investment activity;
- Assist the client in developing measures to avoid, minimize, mitigate, or compensate for environmental and social impacts;
- Categorize the project to specify IFC's institutional requirements;
- Identify opportunities to improve environmental and social outcomes;
- Monitor and document the client's environmental and social performance throughout the life of IFC's investment; and,
- Disclose information about its institutional and investment activities in accordance with the Policy on Disclosure of Information



All environmental and social studies, EA documentation, records and associated information are stored in Desk. Desk is an electronic workspace that provides secure access to several corporate applications and serves as a one-stop-shop for project processing in IFC.

2.4.7. Environmental and Social Requirements of ADB

ADB Environmental Assessment Guidelines describe how to fulfill the requirements outlined in ADB's Environment Policy and Operations Manual on Environmental Considerations in ADB Operations. Information on ADB's policies and procedures for conducting and reporting on the environmental assessment is also provided for all types of projects.

Strategic tools such as country environmental analysis and strategic environmental assessment are also included in guidelines.



3. CONSIDERATION OF ALTERNATIVES

The EIA guidelines define alternatives as “different means of meeting the general purpose and requirements of the activity, which may include alternatives to the: Site (location of property), Type of Activity to be undertaken; Design or Layout; Technology to be used”

It is a specific requirement of EIA process that includes the identification and consideration of feasible alternatives in the early stage or during scoping stage of environmental assessment. The value of this requirement is that alternatives are a form of mitigation, in that certain options may avoid or reduce the nature, extent or duration of one or more impacts, on one or more aspects of the receiving environment. The following section presents an outline of the alternatives which were considered for the project.

Alternatives are generally identified and analysed to determine the most viable method of achieving the project objectives. During the recent years, environmental and social concerns are gaining significant momentum all over the world. Therefore; besides the technical and financial considerations, it is also required to recognize the environmental and social consequences of developmental activities. Alternatives considered in this Chapter include:

- No project option;
- Site Alternatives, their Selection and Rejection Criteria
- Environmental Alternatives, their selection and rejection criteria
- Economic Alternatives, their selection and rejection criteria

3.1. No Project Option

A “no project option” (or “no development”) simply implies no harm to environment and society. However, almost all types of economic development have some social and environmental benefits associated with it. The ultimate objective of this EIA is to look into the options (measures) which can be adopted to maximize the positive effects and minimize the adverse effects of the proposed Project on environment and society.

Under the current crisis in Pakistan, a “no project option” is considered to be the least viable option. The proposed Project can be considered as one of the pioneer industrial state in Pakistan. It is likely to address many issues related to industrial zone in the country. This is also likely to reduce the risk for future investment and will attract more investors to invest in industries in Pakistan. In the absence of the proposed Project, this process is likely to be delayed.

3.2. Site alternatives, their Selection and Rejection Criteria

Selection of the site for the proposed industrial plant was governed by many considerations, both the economic analysis of the estimated costs as well as judgment as to the modifying effects of other factors which are more the matter of judgment rather than mathematical calculations, and have considerable effect on the smooth working of the business unit.

The sites were considered for the establishment of proposed industrial state in and around the Chakwal as it has become an industrial hub of the country. In the light of general discussion of



the factors influencing the industrial location; the sites were evaluated based upon the following criteria;

- o **Land:** Suitability, adequacy, and comparable cost of the sites to install the plant and to expand it whenever feasible.
- o **Labor:** Availability and affordable wage rates — taking cost to benefit analysis into consideration — of the skilled, semi-skilled, un-skilled person is required.
- o **Transportation:** Regular and sufficient transportation facilities for delivery of materials, dispatch of finished products and for the use of the employees.
- o **Market:** Size of the local market and the cost of transporting to central markets vis-a-vis the extent of demand.

3.3. Environmental Alternatives, their Selection and Rejection Criteria

Every development project causes alteration in the existing environment inevitably that can be positive as well as negative. The negative environmental impacts of the proposed industry can be gaseous emission, increased noise levels, excessive water usage, groundwater contamination, and surface water contamination etc. The 'no-go' alternative, also referred as the 'no-action' alternative or 'zero-alternative', can be a consideration in this case. It assumes that the activity does not go ahead, implying a continuation of the current situation or the status quo. It is basically a consideration of the original and undisturbed environment without any development. This option is considered to ensure that all possibilities have been taken into consideration before deciding on a final course of action and also to provide a baseline situation against which the other suggested alternatives can be measured.

In a situation where negative environmental impacts have high significance, the 'no-go' alternative takes on particular importance. In some cases, the 'no-go' alternative may be the only realistic alternative and then it has a critical role to play. It is not true to assume that the 'no-go' alternative is necessarily the best from an environmental perspective. In many cases, expansions and upgrades of existing industries (the 'go' alternative) permit the implementation of technological improvements such as the replacement of outdated equipment that leads to reduced emissions to the air or water, in addition to the primary aim of increased production capacity.

The 'no-go' alternative provides the means to compare the impacts of project alternatives with the scenario of a project not going ahead. In evaluating the 'no-go' alternative here; the benefits of the proposed project are more valued for the country.

3.4. Economic Alternatives, their Selection and Rejection Criteria

Economic alternatives were considered taking into consideration the capital and operational costs for the proposed unit. Land cost, infrastructure cost and machinery cost were taken into account as the deciding economic factor. Also, state of the art machinery will be employed considering it as one-time investment and thus minimizing the maintenance cost during the operational phase. Additionally, it will contribute towards uninterrupted production during operational phase.



3.5. Analysis of Alternatives

The No Project Option for this project is feasible because:-

- Location is prime, which has direct and closest connectivity with the Motorways and main communication arteries such as Islamabad, Airports.
- New prime project in the vicinity of the District Chakwal.
- Establishment of proposed SEZ in an area where a no public sector Industrial Estate exists will attract the new target industries being a lucrative location in the close vicinity of Motorway and Interchange.
- Based on the strengths of the connected districts and resource pool, this economic zone has predominant investment feasibility for industries in SMES like fruit & food packaging, textile, and agro-based industries.
 - Weaving
 - Knitting
 - Apparel
 - Finished Leather goods
 - Food
 - Wood products Metal and Fabrication Plastics
 - Electronics
 - Auto Industries Warehousing Aluminum fabrication
 - Medical Equipment
- The SEZ also very feasible for local investors of nerby region specially for to start new production units with special connectivity and other advantages.

3.6. ALTERNATIVE SITES

No alternative site is proposed for assessment on the basis that the proposed site: -

- is enroot in the China Pakistan Economic Corridor
- Is easily accessible through motorways



4. DESCRIPTION OF THE PROJECT

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

Punjab Environmental Protection Act, 1997 (amended PEPA, 2017) stipulates that an EIA/IEE is mandatory for Development Projects. Therefore, an IEE/EIA is required for projects for policy procedure, filing, review and approval of environmental assessment. The proposed project is to develop Capital Special Economic Zone to international standards. *"This project is enlisted in EIA/ IEE regulation 2022 Schedule- II of subsection H under list 5 Industrial Estate (Industrial Export Processing Zone) of IEE/EIA Regulation 2022 and thus requires Environmental Impact Assessment- EIA."*

4.1. Objectives of the Project

- The main objective of the project is to develop Special Economic Zone to achieve industrial development and management orientation objectives under the umbrella of Government of Pakistan's vision for industrialization, job creation and economic growth.
- We expect to introduce a mix of industrial companies in Capital Special Economic Zone proposed by Capital Development Zone Pvt. Ltd that would contribute to the Economy by generating employment of 60,000-70,000 persons.
- The fiscal benefits under the SEZ law include a one-time exemption from custom duties and taxes for all capital goods imported into Pakistan for the development, operations and maintenance of a SEZ (both for the developer as well as for the zone enterprise) and exemption from all taxes on income for a period of ten years.

4.2. Nature, Location and Site Layout of the Project

The Neela Dullah Interchange area boasts commendable accessibility from prominent locations, essential for its potential as a Special Economic Zone (SEZ). Positioned approximately 40 kilometers from the bustling town of Chakwal, it offers a vital link for efficient transportation via well-maintained roads. Furthermore, its strategic location places it within a reasonable distance from major cities like Islamabad and Rawalpindi, approximately 100 kilometers away, ensuring access to broader markets and transportation networks. Moreover, its connectivity to national highways and motorways facilitates seamless transportation of goods and services across the country, with distances to these vital arteries ranging from 5 to 10 kilometers. This strategic positioning, coupled with its relative proximity to key urban centers and transportation routes, renders the Neela Dullah Interchange area highly accessible, making it an attractive prospect for industrial development and economic growth. The project location is represented in Figure No. 4-1.



Figure 4-1 Location of the Project

4.3. Master Plan for The Project

The master plan for the project is given in Appendix IX- of the report.

4.4. Land Use on the Site

The project area is characterized by flat to gently undulating terrain, is generally favorable for establishing a Special Economic Zone (SEZ).

The breakdown of the land use is given in Table 4-1

Table 4-1 Land Use on Site

Sr. No	Description	Acres
1.	Commercial	236.1600
2.	Industrial	15
3.	Amenities, Roads, Admin, Parks, CETP	50
Total Land		301.1600

4.5. Road Access

The project site is easily accessible from Neela Dullah Interchange and Lahore Islamabad Motorway, Chakwal.

- around 100 Km from Islamabad



- around 250 Km from Lahore
- around 40 Km from Chakwal

4.6. Cost and the Magnitude of Operation

The cost and its breakup is presented in Table 4-2

Table 4-2 Cost of the Project

No.	Description	Million Price (PKR)
	Cost of land	8,400
	Development Cost i.e., Infrastructure Works etc.	7,500
	Miscellaneous	1,200
	Total Price	17,100
	Contingencies @ 5%	855
	Grand Total	17,955

- Detailed site survey, planning and demarcation of the various regions in the project area
- Site suitability assessment
- Process of designing
- Purchase and delivery of equipment
- Development of industries
- Testing and commissioning
- Plantation of various ecologically important species on the designated green space

4.7. Schedule of Implementation

4.7.1 Planning

The proposed project is at its feasibility study stage. This EIA study is a basic and necessary part of the overall planning for the project and will be integrated into the feasibility study.

4.7.2. Design

The construction contractor and fabrication contractor will be hired based on the cost. The technology adopted for the proposed project establishment will be up to date. Tentative project implementation schedule is presented below in Table 4-3.

Table 4-3 Time Schedule for the Project Development

Sr.	Description	Months
1	Soil Report	2
2	Civil Design	4
3	Process and Electrical Design	8
4	Equipment Manufacturing and Delivery	12
5	Civil Construction	10
6	Mechanical and Electrical Erection	10
7	Testing & Commissioning	3
Total Months		49



4.8. Topographic Survey Plan

The project site is approximately 1.0 m to 2.5 m lower than the Motorway-1 level. The topography of the project area is generally plane. The roads are approximately 1-meter high. Topographical map of the proposed site is shown below in Figure 4-2 and attached as **appendix X**.

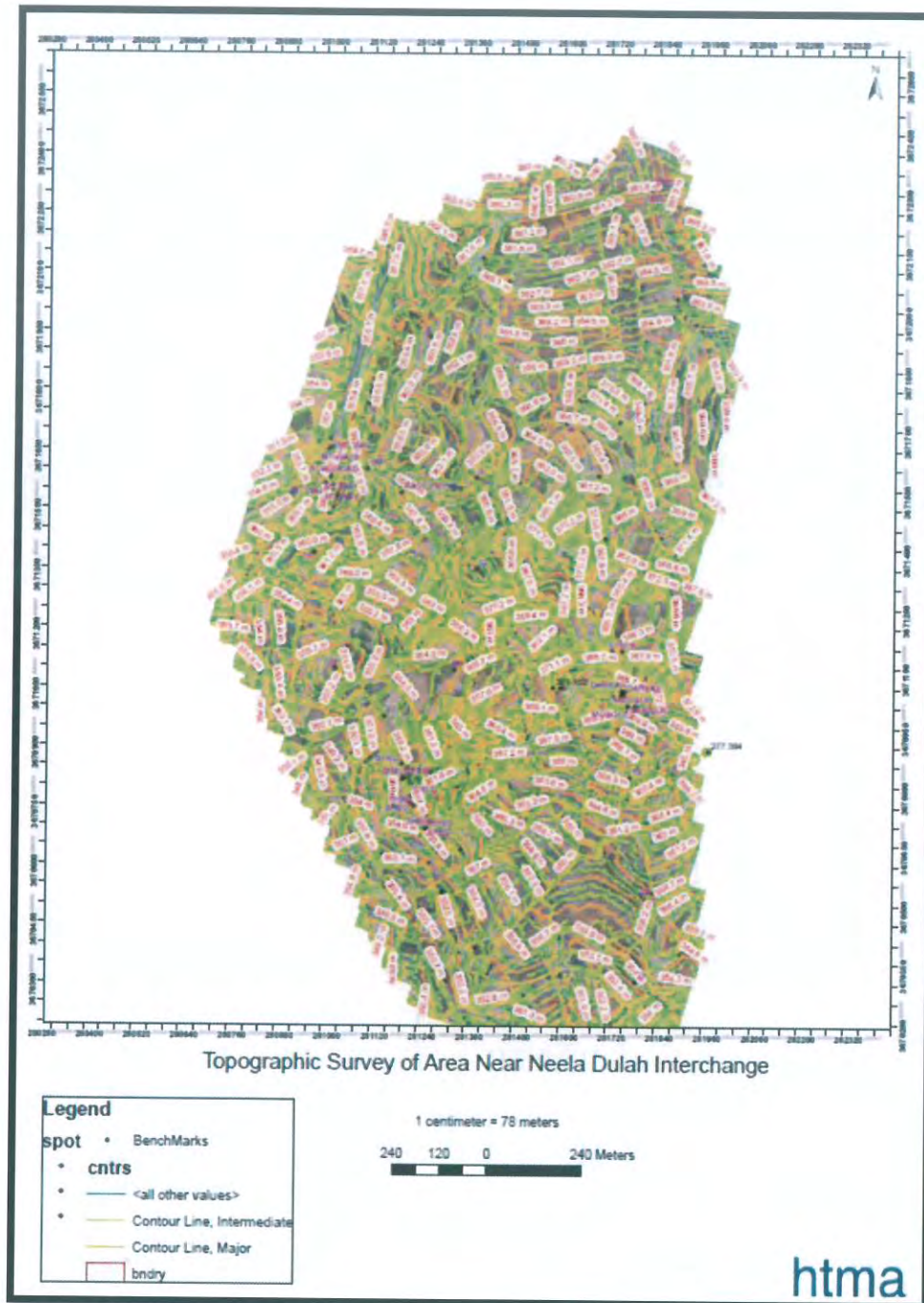


Figure 4-2 Topographical Map of the Project



4.9. TYPES OF INDUSTRIES

High Potential Sector for following industries in SEZ's.

- Manufacturing Services
- Warehousing
- Information Technology
- Textile
- Light Engineering
- Auto parts
- Plastic Industry
- Pharmaceuticals
- Chemicals
- Electronics
- Food & Beverages
- Mobile Manufacturing

4.9.1. Services

- i. Jamia Mosque
- ii. Hospital
- iii. Central Weigh Station
- iv. Security Office
- v. Labor Club
- vi. Ladies Club
- vii. Commercial area

4.9.2. CONNECTIVITY

Table 4-4 List of Areas Nearby the Project

Airport	50 KM
Railway Station	64 KM
Dry Port	70 KM-NLC Dry Port, Islamabad
Lahore City	250 KM
Islamabad	100 KM
Chakwal	40 KM

4.10. Commercial Buildings

To meet the daily requirements of the project. Some commercial and public buildings have also been proposed which include;

- Post office
- Clinics
- Banks
- Canteens
- Hotels
- General Shops



4.11. Waste Water Treatment Plant and Solid Waste Management System

The proposed industrial estate will feature waste water treatment plant. Keeping in view the slope of the project area, the plant is planned on the eastern side of the site.

The solid waste site will be designed after clarification of type of the industries. In case of proposed industrial estate, two types of solid waste will be generated. i.e. industrial waste and municipal waste. Collection of both types of wastes will be done via centralized collection system. However, in case of industrial waste collection, collection task will be assigned to contractor after legitimate licensing process. Both contractor and industrial estate will be responsible for the proper collection of the industrial wastes. In case of municipal waste, door to door collection will be carried out. Both types of collected wastes will be further categorized depending upon their nature. The recyclable wastes will be recycled and rest of the collected waste will be taken to proper disposal site present in the nearby vicinity of Chakwal District.

4.12. Fire Fighting System

A well-equipped and pressurized water distribution system which will comprises of pipes, hydrants, gate valve etc. will be provided. The system shall be operated automatically in case the pressure is dropped in the system by operating any fire hydrant.



5. DESCRIPTION OF THE ENVIRONMENT

An environmental baseline study is intended to establish a data base against which potential impacts can be predicted and managed subsequently. The EIA of the proposed project covers a comprehensive description of the project area, including regional resources which are expected to be affected by the project, as well as, those which are not expected to be directly affected by the operation of the project.

A site visit was conducted to survey the field area for collection of relevant data. Interviews were conducted with the general public and stakeholders of the project area in order to seek the public opinion on the implementation of the proposed project. The environmental impacts of any activity or process will be assessed on the basis of deviation from the baseline or normal situation. The following components form part of the baseline study.

- Physical Environment
- Ecological Environment
- Socio-economic Environment

5.1. Baseline Physical Environment

5.1.1. Physical Features of the Project Area

Chakwal District is a district in the province of Punjab, Pakistan, with its administrative capital in City of Chakwal. Chakwal is situated 90 km south-east of the federal capital, Islamabad and is named after Chaudhry Chaku Khan. The district consists of five tehsils; Kallar Kahar, Choa Saidan Shah, Chakwal, Talagang and Lawa.

Based on geography, topography and geology, the project area is briefly described below:

5.1.2. Geography

The district is located between 32°55'29.39" N and 72°51'11.99" E. The total area of Chakwal district is 1,864,934 acres. Elevation of Chakwal is 498 m above sea level. This is bordered by Khushab to its south, Rawalpindi to its northeast, Jhelum to its east, Mianwali to its west and Attock to its northwest. The southern portion runs up into the Salt Range and includes the Chail Peak, 3,701 feet (1,128 m) above the sea, the highest point in the district. Between this and the Sohan river which follows more or less the northern boundary, the country consists of what was once a fairly level plain, sloping down from 2,000 feet (610 m) at the foot of the hills to 1,400 feet (430 m) in the neighborhood of the Sohan.

5.1.3. Seismic Zone

According to seismic zoning of Pakistan the project area lies in seismic zone 2B and represents minor damage. Earthquake with high intensity for a fundamental period of more than 1 second may cause damage to infrastructure. Seismic zoning map of Pakistan is given in Figure 5-1.

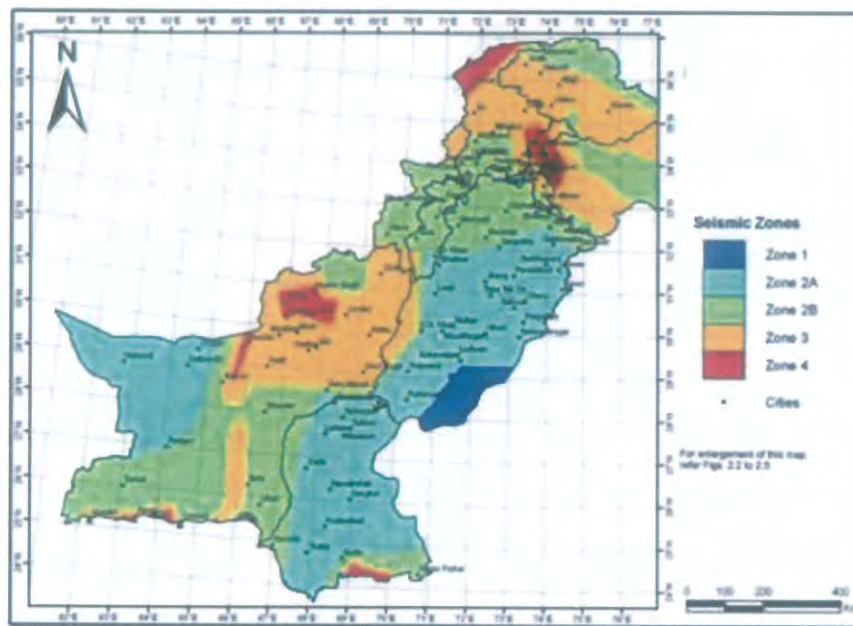


Figure 5-1: Seismic Zoning Map of Pakistan

5.1.4. Climate

The climate of Chakwal is considered to be a local steppe climate. The summer season starts from the month of April and continues till October. May and June are the hottest months with day temperature usually ranging from 40°C to 45°C. The winter season begins from the month of November and continues till March.

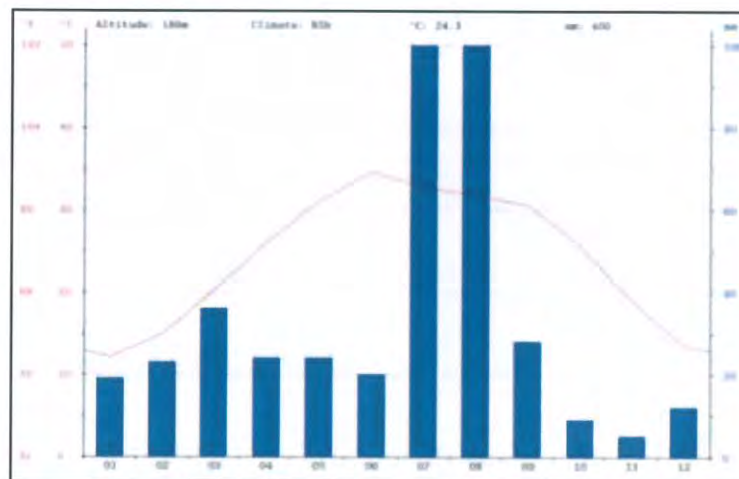


Figure 5-2: Climate of Chakwal

5.1.5. Temperature

The summer season starts from the month of April and continues till October. May and June are the hottest months with day temperature usually ranging from 40°C to 45 °C. The winter season begins from the month of November and continues till March. January is the coldest month with a minimum temperature of 1 °C. Dust storms occur occasionally during summer season relieving temporarily the intensity of heat.

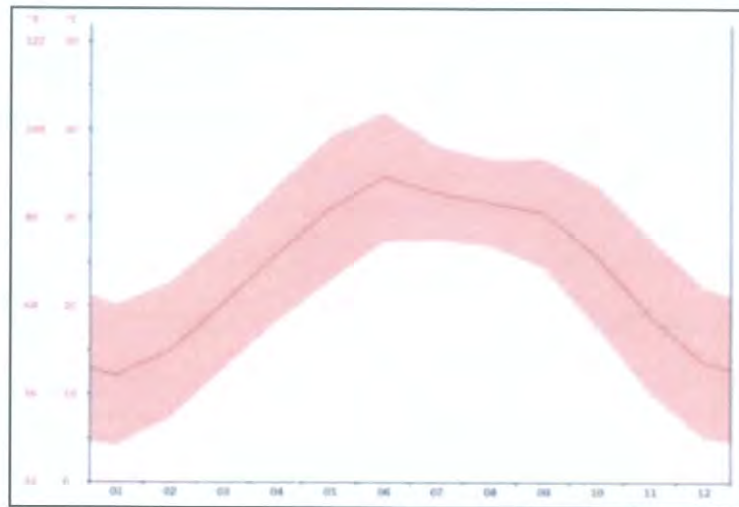


Figure 5-3: Average Temperature in Chakwal

5.1.6. Rainfall

In Chakwal District, precipitation averages 121.2 mm. The greatest amount of precipitation occurs in July, with an average of 100 mm.

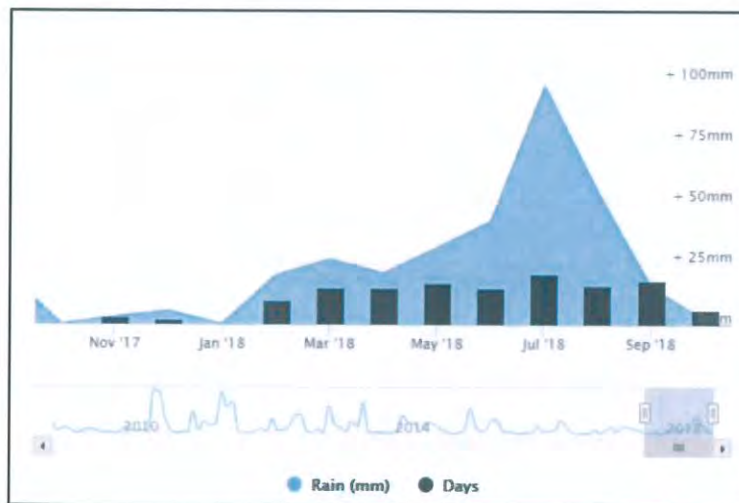


Figure 5-4: Average Rainfall Amount (mm) and Rainy Days in Chakwal



5.1.7. Humidity

July, August and September are the most humid months in the area, whereas May and June are the least humid months. Average monthly relative humidity values at various locations in the project area are 55%.

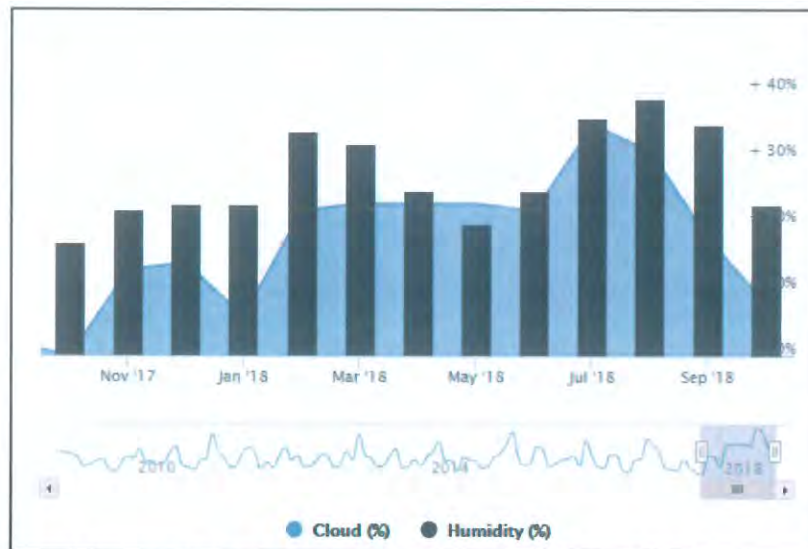


Figure 5-5: Average Percentages of Humidity in Chakwal

5.1.8. Water Resources

Water constitutes an important section of the physical environment of an EIA Study to define its magnitude, quality and occurrence throughout the entire project corridor. Water resources of the area are discussed under two broad headings, surface water resources and groundwater resources.

5.1.9. Surface Water

Surface waters resources are usually exposed to the surface of earth in the form of mobile and immobile situation which includes snow-clad mountains, rivers, non-river streams, rain, sleet, wetlands and oceans. Surface resourced waters are highly susceptible to natural and anthropogenic derived contamination in terms of Chemical and Biological contamination and thus are not used for sensitive applications such as drinking directly, unless it is pre-treated. There is no surface water body found near the vicinity of the project area.

5.1.10. Ground Water

Ground water resources are found hidden and camouflaged into the surface of earth in the form of mobile and immobile state and exist as shallow and deep wells, confined and unconfined aquifers, springs and watersheds. Ground resourced waters are not easily susceptible to natural and anthropogenic derived contamination caused by Chemical/ Biological pollution and thus is directly used for sensitive applications such as drinking even it is un-treated.

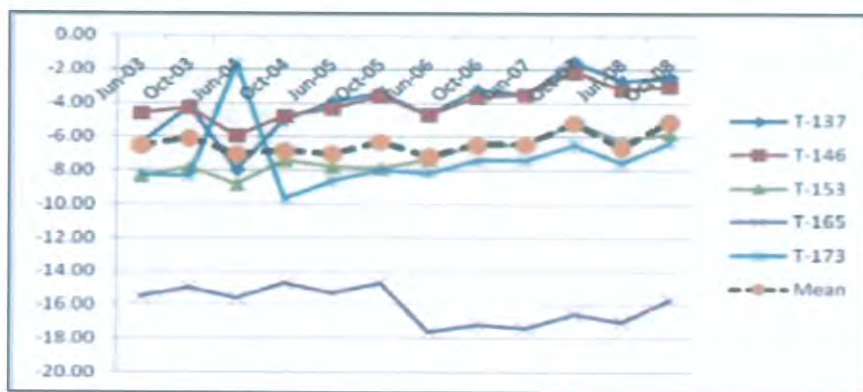


Figure 5-6: Chakwal District – Water Table Trends (Feet below GLS)

Perusal of the above figure indicates that:

- The project area lies in the district of Chakwal; the groundwater table normally exists approximately 5 feet to more than 20 feet below the GSL

5.2. Baseline Ecological Environment

Ecological Environment includes:

- Flora
- Fauna
- Endangered species

5.2.1. Flora

A wide range of Flora exist in the district. Amongst plants, the species which are most abundant in the district are:

- Kau (Olea Cuspidata)
- Phulai (Acacia Modesta)
- Sanatha (Dodones Viscosa)
- Gurgura (Monotheca Buxifolia)
- Pataki (Gymnospo Riaroyleana)

5.2.2. Fauna

The faunal species which exist in various areas of Chakwal district are:

- **Grey partridge**— found all over the district, especially in areas, which are sparsely populated.
- **Black partridge**— found along the seasonal channels and water holes in the bellas through out the district.
- **Chakore**— found in dry rocky areas in the district especially in the Choa Saidan Shah area.



- **See See partridge**— found at a number places in the district in the dry rocky area especially in the Kallar Kahar mountain belt leading into subdivision Talaga

5.2.3. Endangered Species

There are no floral or faunal species inhabiting in the project area that are included in RED Data Book of IUCN.

5.2.4. Baseline Socio-economic Environment

Socio-economic and other relevant information revealed from Multiple Indicator Cluster Survey (MICS) 2007-08. One of the main objectives of Multiple Indicator Cluster Survey (MICS) was to establish credible baseline for socio-economic status at each District and Tehsil Level.

Table 5-1: Summary of Socio-economic Indicators

Socio-economic Indicators	District Chakwal
Number of households	1272
Number of under-5 children	710
Improved source of drinking water	96.7%
Water treatment used in the household	2.6%
Percentage of population using sanitary means of excreta disposal.	65.3%
Proper disposal of solid waste	3.0%
Literacy rate	57.5%
Percentage of children for primary school entry	26.7%
Total child labor	3.2%
Had cough for more than last three weeks	0.5%
Diagnosed with Tuberculosis during last one year	0.3%
Diagnosed with Hepatitis during last one year	0.6%
Employed	87.9%
Unemployed and seeking job	12.4%
Household Utilities	
Electricity	91.7%
Natural Gas	7.7%
Radio	38.2%
TV	59.6%
Cable TV	6.2%
Telephone	20.9%
Mobile	79.7%
Socio-economic Development	
Livestock	59.3%
Mean household size	6.7%

5.3. Quality of Life Values

5.3.1. Settlement Patterns

Different type of houses were observed in chakwal during survey i.e., katcha, pakka, semi pakka etc having poor drainage system. Majority of people live within the village, a few in their farmhouses (Deras) while some make their homes on their agricultural land. So there is no formal pattern of settlements. Family composition of both the villages is dominantly joint family



system but a few nuclear families also exist in the area. 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.

5.3.2. Indigenous People

People inhabiting the project area are of different castes and races. Most of the families have been living here from 20 to 25 years which has led to homogeneity of culture and the development of a closed economy. There is no danger of damage or elimination of indigenous community as the locals are steeped in their customs and have no intention of relocating.

5.3.3. Religious & Ethnic Groups and Caste Patterns

People of Chakwal speak Punjabi, Urdu etc. Religion plays an important role in the social structure of the society. Sunni Muslims are primarily inhabiting here except a few families of Ahl-e-tasheh and Ahl-e-Hadees.

5.3.4. Social Infrastructure and Facilities

Overall the social and physical infrastructure is not up to the mark in the project area. However, the project area is better as compared to the other rural areas of the province. A brief account of the education, health, infrastructure and markets of the area is as follows:

5.3.5. Health facilities

Basic Health Unit, Dispensaries and Private clinics exist in the surrounding villages of the project area. People also access to private hospitals in city and sometimes to nearby DHQ hospitals. Fever, malaria and chest congestion, Hepatitis-C were reported as the common diseases of the project area. In the project area, health conditions are much developed due to access of below mentioned hospital facilities.

DHQ Hospital	01
THQ Hospitals	03
RHCs	10
BHUs	64
Rural Dispensaries	36
MCH Centre	09

5.3.6. Economy of the Area

Most people of the district prefer to join armed forces like Pakistan Army, Pakistan Navy and Pakistan Air Force. Chakwal has the highest proportion of its population serving in the Armed forces of Pakistan. A handsome percentage of the population is employed in the mining, industrial and trading sector with a very small fraction employed in technical fields like health, education, banking and engineering.

Chakwal is generating a large number of employment opportunities for its locals and outsiders. Industrial areas are using manpower, while nearby towns are providing business opportunities to the residents. In this semi urban area, people are involved in daily wages jobs, while some are involved in small business. They normally travel to adjacent areas for work. Some work in



the industrial area and in the surrounding universities and colleges. People are also involved in agriculture. Area having access to irrigation water is another source of income.

Similarly, livestock is a secondary source of income. It is safe to assume that livestock farming is practiced uniformly in both types of areas. Economy of the project area is dependent primarily on two occupations i.e., agriculture (maximum) and livestock (limited extent), while some locals are also involved in manual labor.

5.3.7. Agriculture and Vegetation

Farming is the main occupation of the people of Chakwal. The total cultivated area is 10,894 acres while forest area and road side plantation cover 143,377 acres and 375 km respectively. The general vegetation consists of dry deciduous scrub. The grass species which are dominant in the area are: Sariaia, Khawi, Mesquite and Karir. A wide range of plants exist in the district. Amongst plants, the species which are most abundant in the district are Kau (*Olea Cuspidata*), Phulai (*Acacia Modesta*), Sanatha (*Dodones Viscosa*) and Gurgura (*Monothea Buxifolia*). The animal species which exist in various areas of Chakwal District are Grey Partridge, Black Partridge, Chakor and See-see Partridge.

5.3.8. Industries

Textile Mills	04
Packing Material Mills	03
Poultry Feed Mills	03
Brick Kilns	120
Flour Mills	06
Poultry Farms	2,267

5.3.9. Archeological and Cultural Sites

There were no archaeological sites found near the project area, although, nearest chaks do have mosques, graveyards and darbars.

5.4. Lab Reports of Environmental Analysis

To assess the baseline conditions of the project area, following environmental components were monitored.

- Ambient air quality
- Noise levels and
- Drinking water quality

The lab reports of environmental analysis of the above mentioned parameters are attached in **Annexure IX**.

5.5. Suitability of the Site

The site does not fall in environmental sensitive area and all commodities are at a suitable distance from project site as they will not have impacted by the construction activities even locals will get more benefits and job opportunities. No replacement, relocation and rehabilitation are required for the development of proposed project.



6. ENVIRONMENTAL IMPACTS ASSESSMENT

This section provides the analysis of the potential impacts during different stages of the proposed project on the physical, biological and socio-economic environment of the project area.

6.1. What is the Problem?

The problem is the environmental impacts resulting from project activities related to Industrial estate. The project is based on Development of industrial estate located in District Chakwal. The environmental impacts resulting from project operations on each environmental setting including physical, ecological and socio-economic environment.

6.1. When Problem Will Occur and When It Should Be Addressed?

The impacts may occur during different stages of the project activity. The impacts should be addressed at every stage of project operations. The environmental impacts should be addressed at installation and operational stage of project activities.

6.2. Where Problem should be addressed?

The problem as mentioned above should be addressed at project location where project activities are being carried out. All the impacts resulting from project location should be addressed, if any.

6.3. How the Problem should be addressed?

The problem should be addressed using specified criteria and methods as specified in Guidelines/Checklist. The impacts should be addressed using one or more methods as specified in the Checklist provided by EPA, Punjab.

6.4. Ways of Achieving Mitigation Measures

6.4.1. Changing in Planning and Design

The mitigation measures as specified in the EIA Report will be achieved by the implementation of Environmental Management and Monitoring Plan. Any significant changing in planning and design or EMMP will be made based on requirements in future. It may be communicated to EPA, Punjab in case of significant changes.

6.4.2. Improved Monitoring and Management Practices

Improved monitoring and management practices will be adopted to ensure the implementation of mitigation measures as suggested in the EIA Report. Improved monitoring and management practices may include the followings:

- Monitoring of all management measures as suggested in EMMP.
- Monitoring of Environmental parameters as suggested by EPA, Punjab.
- Monitoring of worker's health and safety.
- Monitoring of implementation of potential environmental enhancement measures.



6.4.3. 6.5.3. Compensation in Money Terms

Compensation in terms of money is only required in case of any relocation or replacement of community/settlement due to project activities.

6.5. Impacts on Physical Environment

This section provides the potential adverse impacts of the proposed Project on physical environmental resources of the area (land, water and air), the notable impacts discussed below.

6.5.1. Impacts on Land Resources

This section explains how the proposed project will affect the land use, soil erosion and contamination, and describes mitigation measures to manage these impacts

6.5.2. Land Productivity and Use

Following are the major impact on land productivity and use.

- Most significant impact will be the conversion of some agricultural land into industrial land. It is worth to mention here that land in the project area is industrial as per the map of LDA.
- Due to proposed project construction and operation, other industrial activities may start in the vicinity of area, where at present there is no such type of activity. This may cause negative impact on the existing environment;
- Borrow pits and other landscape depressions if left open, may prove hazardous to human beings, livestock and wildlife;
- Open pits containing water are potential sources of mosquito breeding if left stagnant, and can create health problems;
- Surface run-off from the impervious surface of the proposed carriageway can further aggravate the flooding of embankment sides during the operation stage;
- Induction of infrastructural development works may change the local drainage pattern of the area. This can cause ponding in the vicinity of the project area in rainy season, which ultimately affect the current use of land patterns.

Construction activity may cause dust and smoke emission may be injurious to the residents of adjacent settlements

6.5.3. Soil Erosion and Land Sliding

Soil erosion may occur in the workshop areas as a result of improper runoff drawn from the equipment washing-yards and improper management of construction activities. Due to development of proposed area. Velocity of runoff will be increased which will ultimately enhance the soil erosion.

Once the proposed and existing roads (after rehabilitation) return to normal operation, it will be subject to a natural depreciation as high embankments become increasingly prone to soil erosion.



6.5.4. Soil Contamination

Soil project area may get contaminated due to the following reasons

- A large quantity of solid waste will be generated by the Project during construction stage. If this solid waste was not properly disposed of, it will contaminate the soil resources especially during monsoon season.
- Some chemicals used in laying of water supply pipe joints, sheathing on electric wires and cables are hazardous and toxic in nature. All the carbon based compounds are toxic to varying degrees. Hydrocarbon group of chemicals are toxic and fuel, petrol, diesel and all the lubricants are too toxic in nature. In case proper care is not taken for handling, storing and transportation of these toxic substances may cause damage to the health of the workers as well as their spills will contaminate the soil.

6.5.5. Mitigation Measures

The mitigation measures, which will be carried out in design stage, construction as operation stages for land resources are as under:

6.5.5.1. Land Productivity and Use

The following practices will be adopted to minimize the damages to land productivity and use:

- Damage to the land due to implementation of the Project will be a permanent loss and it is expected that due to increase income of the local people and availability of more job resources due to the Project, yield of adjoining agricultural land will be increased which will compensate to this loss up to Greater extent.
- The expected mushroom industrial growth around the Industrial Estate should
- be properly controlled by formulating and enforcing the law.
- As far as possible, waste/barren land and natural areas with a high elevation
- will be used for borrow material and setting up project facilities.
- Where the use of adjacent agricultural land is unavoidable for borrow of earth material, the top 30 cm of the plough layer will be stripped and stockpiled for redressing the land after the required borrow material has been removed.
- The excavation of earth fill will be limited to an approximate depth of 50 cm. This practice will be applied uniformly across the entire extent of the farmland unit acquired for borrowing earth material.
- Where deep ditching is to be carried out, the top 1m layer of the ditching area will be stripped and stockpiled. The ditch will initially be filled with scrap material from construction and then levelled with the stockpiled topsoil to make it even with the rest of the area. It shall be ensured that the scarp does not contain any material, which may produce leachates or contaminate the soil.
- Ditches or borrow pits that cannot be fully rehabilitated will be landscaped/converted



into fishponds to minimize erosion and to avoid creating hazards for people and livestock.

- The Project works have been designed in line with natural drainage to ensure that local drainage pattern should not be disturbed,
- Side drains will be constructed to prevent flooding on the carriageways. In development areas, side drains will be constructed along the road sides; in open areas, a drain will be constructed along the embankment.
- Proper storage place of each type of material to be used during the construction to avoid any hindrance to natural slope. Contractor will be made responsible for the clearing of left over material at the site. In this regard prior to the start of work, contractor should submit the site restoration plan. Site restoration plan should be as pragmatic as possible.

6.5.5.2. 6.6.7. Soil Erosion and Land Sliding

- Good engineering practices will help control soil erosion both at construction sites and in peripheral areas, particularly in borrow areas and along transportation tracks. These will include the following measures:
- Low road embankments will be protected from erosion by planting indigenous grasses and low height trees that can flourish under project site conditions

6.6. Impacts on Biological Environment

The biological environment mainly includes flora and fauna. Impact on flora and fauna and corresponding mitigation measures are described in the following paragraphs;

6.6.1. Impacts on Flora

Following impacts will be on the flora of the area;

6.6.2. Trees to be planted

There is no proper tree growth at the project site as the area is water logged. However, some subsistence farming and self-grown dwarfed trees are there on the edges. Cutting of these trees will not have any significance impact. The proponent will plant 25000 trees to be grown at the project site and 15% of the scheme will be kept green which include parks and green corridors. These trees will be planted in green corridors to act as buffers along roads. As these scattered trees are small in number, their replacement will be made good by planting new trees on both sides of the main, lateral and minor roads.

Keeping in view the saline and water logged conditions in the project area a number of trees might be planted as a part of the project on the boundary of industrial estate. Saline areas, which are lying unutilized by the communities, could be rehabilitated following proper soil amendments, preparation and choice of suitable species.

Trees showing successful growth include the following

- Shesham



- Eucalyptus
- Guava

Main species proposed in the project area:

- *Conocarpus eractus* (buttonwood),
- *Dalbergia sissoo* (shisham),
- *Tamarix aphylla* (Athel tree),
- *Morus alba* (Mulberry),

To facilitate the widening and expansion of plantation there will be need of growing more trees at the boundary of project site along the sides of pedestrian corridors inside the parks of three different community cores. For each tree to be cut, two trees to be planted to conserve the biodiversity.

The selected area has scattered shrubs and no significant impacts are envisaged due to removal of shrubs.

6.6.3. Impacts on Fauna

Following are the specific classes of fauna which are expected to be affected due to the project implementation.

6.6.4. Mammals and Reptiles

During the construction phase, there will be negative impacts on the mammals and reptiles of the area. Mammals, such as squirrel, jackal etc. will avoid these areas for fear of being hunted. Same will be the case with reptiles; some reptiles might be killed during the digging and dragging operations.

6.6.5. Birds

Birds will try to find shelter and food somewhere else and will tend to move away from the Project site for fear of being hunted/trapped.

6.6.6. Mitigation Measures

The following mitigation measures will be adopted to alleviate the adverse impacts on the vegetation growth of the area.

- A tree plantation program will be incorporated into the detailed design not only to compensate the loss of trees but also to enhance the aesthetic view as well as to reduce the air and noise problems.
- Existing access tracks will be used for borrow of construction material and new paths will be constructed only in case when no existing path is available to avoid damage to the existing trees and bushes.
- While making paths for carriage of construction materials to the site care will be taken that minimum land is utilized and minimum area is disturbed. Cutting of trees should be avoided by making diversions.



- The camps and workshop facilities will be established on barren land; however, if such type of land is not available, it will be ensured that minimum clearing of the vegetation occurs and minimum damage to trees and undergrowth is ensured.
- The Contractor's staff and labour will be strictly directed not to damage any vegetation such as trees or bushes in the nearby areas.
- Contractor will provide the fuel wood/gas cylinders at the camps for cooking purposes and cutting the trees/bushes for fuel will not be allowed.

The following mitigation measures will be adopted to reduce the impacts of project and protect fauna.

6.6.7. Mammals and Reptiles

Mammals and reptiles will be protected by following practices:

- Hunting and harassing of wild animals shall be strictly prohibited and Contractors will warn their labor.
- Lights used in the camps, during construction activities will be kept to the minimum requirement. In the wildlife sensitive areas, upward scattering lights will preferably be used.
- Vehicle speed will be controlled to avoid incidental mortality of small mammals and reptiles.
- Periphery of the camps will be fenced and gated to check the entrance of the wildlife into the construction camps. Camp wastes harmful to wildlife should be properly disposed of/dumped.

6.6.8. Impacts on socioeconomic and cultural Environment

The section describes the impact of the proposed project on local communities, construction workers, indigenous and vulnerable people as well as on structures or sites of cultural and religious significance.

6.6.9. Impacts on Local Communities/ Workforce

The area surrounding communities will be affected during the construction and operation phases as follows:

- During the construction phase the general mobility of the local residents and their livestock in and around the project area is likely to be hindered.
- Community will have to face the noise and dust problems during the construction phase and air and noise omissions during operation stage.
- Induction of outside workers in the Contractor labor may cause cultural issues with the local community.

6.6.10. Generation of income

Local people will find business activities due to Implementation of the Project particularly persons settled in the vicinity of project area, Approximately hundreds of



thousands Jobs will be generated by the implementation of project which subsequently enhance the living standards of community.

6.6.11. Gender issues

As the project area lies close to the rural areas and rural community, women activities in the field may become affected due to the construction activities. The rural women normally use the open field latrines and their privacy may suffer due to the project activities,

The Induction of outside labor may create social and gender issues due to the unawareness by them of local customs and norms. It will also cause hindrance to the mobility of local women.

6.6.12. Indigenous, Vulnerable and Women Headed Households

During the social field survey of the project, no Indigenous group of people was identified. So, no Impact on the Indigenous people is envisaged due to the Implementation of the project.

Income of vulnerable people i.e. squatters settled on Government land may be affected due to the implementation of the Project, like relocation of their infrastructure, loss of land, crops, trees, etc. The owners of the affected structures identified during the field visits are also falling below the poverty line. No women headed household was identified during the social survey of the Project.

6.6.13. Mitigation Measures

- The Project will plan to prioritize the recruitment of people living, or originating from, the project affected communities during Project operation. Irrespective of origin, the Project is designed to accommodate all construction and operation workers within a camp inside the Project location. Coordinate recruitment efforts related to non-skilled labor, including for non-skilled labor positions
- required by contractors.
- Local recruitment commitment will be clearly defined and extended to the employees of contractors and to the construction phase of the Project and the geographic scope of local recruitment will be based on prioritization by proximity to the Project.
- The commitments will be articulated as a clearly defined policy supported by procedures and quantified targets. To specifically help reduce significant potential social and demographic impacts for more vulnerable or marginalized sectors of the host communities, the Project employment opportunities for women and senior citizens will be promoted wherever feasible and culturally appropriate.
- The vulnerable people of the communities located in the vicinity of the SEZ will be given priority in provision of jobs, donations and scholarships. Through its CSR activities, a special focus will keep on the vulnerable people and their socioeconomic status will be regularly monitored.
- A grievance redress mechanism will be especially designed for the vulnerable people of the community. Their complaints will be addressed on priority basis and a liaison officer will be designated to accommodate them and address their grievances.



- Feedback consultations will be held with the vulnerable people to record the efficiency and effectiveness with which their complaints are addressed. Their views and feedback will be registered and if required, improvements in the
- grievance redress mechanism will be made.
- The Project labor will be sensitized on local cultural and social values as part of the induction program who originates from other parts of the country or from abroad.

6.7. Methodology for Impacts Identification

Environmental sensitivity of the project area is described through a thorough review of the project activities and the evaluation of significance of impacts is carried out through Environmental Checklists and GIS and computer expert system. In checklists, the impacts have been given magnitude based on their severity. A detailed map of the project area is developed on GIS to study the impacts on nearby environmental settings. This chapter then suggests effective mitigation strategies to help combat the adverse nature of these impacts and delivers a monitoring scheme to manage them.

6.8. Impacts Analysis and Prediction

The impacts on different environmental settings were analyzed by conducting different consultation sessions with environmental experts and individuals. Their views were recorded and incorporated in the report. The list of stakeholders and individuals consulted will be provided in the chapter of Stakeholder's Consultation.

6.9. Characterization of Impacts

Impacts were characterized based on the following parameters:

Nature	Duration
Magnitude	Spatial Boundaries
Extent	Reversibility

The impacts characterization has been given in Table 6-1.

Table 6-1 Characterization of Impacts

Environmental Component	Impacts		Nature of Impact		Duration			Spatial Boundaries			Likelihood			Reversibility	
	Positive	Negative	Direct	Indirect	Short Term	Intermediate	Long term	Local	National	Global	Low	Moderate	High	Reversible	Irreversible
Water Resources								Nil							
Land Resources															
Air Quality															
Noise															
Solid waste															
Wastewater								Nil							

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7. SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

7.1. Project location:

The project would pose aesthetic and noise impacts on the nearby areas. Dust would however have impacts on the areas bit far away. There is no water body found near the vicinity of the project site. Hence, there will be no impact on water quality due to project activities. The mitigation measures for dust and noise problems are discussed below.

7.2. Mitigation Measures

Following are the steps that may be adopted to control noise and dust problems at site.

- Use of PPEs (noise suppression equipment-ear mufflers etc.) will be ensured by the workers where noise levels are higher than 85 (dBA).
- Project activities will be ensured at daytime when background noise levels are high.
- Vehicles speed limit will be maintained to avoid excessive vibrations.
- Regular maintenance of machinery will be ensured.
- Controlled water sprinkling will be ensured to reduce dust/PM₁₀.
- Maintain appropriate buffers between the site and receptors if practical.
- Use of PPEs (face masks etc.) will be ensured by the workers and staff.

7.3. Anticipated Environmental Impacts Related to Project Design

The project may have high blowing off rates and dust emissions. Better design can resist such impacts. Thus, barriers shall be developed by extensive vegetation and trees on the boundaries of the project.

7.4. Environmental Impacts during Installation Stage

The summary of the positive and the negative impacts observed on the environment by the cement production on the project area has been summarized in Table 7-1. The impacts have been given magnitude based on the scaling given below.

Scale Range	0 to 5
Major Impact	5
Moderate	4
Intermediate	3
Minor	2
Low	1
No Impact	0



(+) sign is used for positive impacts and (-) sign for negative impacts. The mitigation measures will be explained after a short while.

Table 7-1 Identification of Impacts during Installation Stage of the Project

Sr. No.	Component	Environmental Issue	Impacts	
			Positive	Negative
1	Physical Environment			
	Water	Channel Water Quality		0
		Channel Water Discharge.		0
		Groundwater Quality		0
		Groundwater Level		0
		Surface Run-Off		0
		Flooding		0
		Drainage		0
	Land	Soil Salinity		0
		Soil Erosion		0
		Land Utility / Productivity	+3	
	Solid Waste	Land Pollution Breeding of flies and rodents Odor		0
	Climate	Micro-climate changes.		0
	Atmosphere	Dust		-3
		Noise		-2
	Sub-Total		+3	-5
2	Biological Environment			
	Flora	Forests /Trees	+2	
		Other Terrestrial Vegetation		0
	Fauna	Mammal Communities /Habitat		0
		Reptile Communities /Habitat		0
	Sub-Total		+2	0
3	Socio-economic Environment			
	Social	Population	+1	
		Land Ownership	+1	
		Land Lease	+2	



		Worker's Health and Safety		-2
		Security		0
		Social Cohesion/ Attitude	+1	
		Food/ Nutrition	+1	
		Health		0
		Education	+1	
	Economic	Income Levels	+1	
		Employment	+2	
		Land Value	+2	
	Institutional	Institutional Activities/Effectiveness	+2	
	Human Use	Cultivation	+1	
		Livestock	+1	
		Afforestation	+2	
		Infrastructure		0
		Domestic Water Supply		0
		Community Development	+2	
	Resettlement	Land		0
		Dislocation of Population		0
		Loss of Property		0
		Loss of Infrastructure		0
		Resettlement of Affected		0
	Sub-Total		+20	-2
	Grand Total		+25	-7

The potential environmental impacts resulting during installation phase of the project and their possible mitigation measures are given in Table 7-2.



Table 7-2 Environmental and Social Impacts of the Proposed Project

Subject Area		Potential Impacts During Construction	Potential Impacts During Operation	Mitigation
Physical Environment	Air Quality	- Dust from construction activities. - Traffic-related air quality impacts.	- Effects of stacks emissions on ambient air quality. - Traffic-related air quality impacts. - Green House Gas emissions	- Watering of the material stockpiles, access roads and bare soils on an as required basis to minimize dust. - Increase the watering frequency during periods of high risk (e.g. high winds). - Stored materials such as gravel and sand should be covered and confined - Vehicles with appropriate exhaust systems will be used. - Maintenance of all vehicles on regular basis. - Establish and implement vehicle speed limits to minimize dust generation - Cover haul vehicles transporting dusty materials (cement, borrow) moving outside the construction site - Use of specified haulage routes and reduce vehicle speed where required.
	Water Resources	- Control and management of site drainage. - Wastewater discharge, Sewage disposal and foul drainage	- Water requirements for operation - Discharge of process and wastewater.	Stockpiles of potential water pollutants (i.e. oils, construction materials, fuel, etc.) shall be placed so as to minimize the potential of contaminants to enter local watercourses or storm-water drainage.



		Effects on groundwater quality.	- Operation of drainage systems on site. - Discharge of storm water, sewage and drainage	- Preparation of Emergency Spills Contingency Plan. - Storm-water runoff from all fuel and oil storage areas, workshop, and vehicle parking areas is to be directed into an oil and water separator before being discharged to any watercourse
	Soils, Geology and Topography	- Effects on soils and topographic features. - Soil contamination	Soil contamination during construction phase	- Ensure the topography of the final surface of all raised lands are favorable to enhance natural draining of rainwater / flood water - Restore the natural landscape of the construction sites after completion of work
	Land Use, Landscape and Visual Issues	- Impacts on existing land use on site. - Impacts on existing land use in the surrounding area. - Effects of construction activities on landscape character. - Visual impact of construction activities.	- Impacts on existing land use on site. - Impacts on existing land use in the surrounding area. - Effects on landscape character. - Visual Impact of operating facilities.	- Stop work and inform the site manager immediately if, during construction, an archaeological or burial site is discovered. - It is an offence to restart work in the vicinity of the site until approval to continue is awarded by the plant management. - Resolve landscape change issue in consultation with local leaders and supervision consultants.



Ecological Environment	Flora	Loss of natural vegetation and crops	Impacts on flora due to altered drainage and runoff patterns	- Removal of trees should be limited to the development footprint - Construction activities shall reduce the loss or disturbance of vegetation - Use clear areas to avoid cutting of trees - A procedure shall be prepared to manage vegetation removal, clearance and reuse - Inform the plant management before clearing trees
	Fauna	- Losses of habitat or species due to land take. - Disturbance or damage to adjacent habitat of species	- Disturbance or damage to adjacent habitat - Effects on birds migration routes	Project should ensure the safety of various animals at construction and operation camp area.
	Economy Related Impacts	Impacts on local skilled and un-skilled labor and businesses.	Impacts on local labor and businesses	The increased government revenue could be used to meet objective by improving infrastructure and services in areas local to the project.



	Social Settings and Services Related Impacts	• Demographic changes due to influx of people. • Pressure on existing infrastructure, utilities and services.	• Small scale demographic and cultural changes.	• Safe, reliable water supply, Sufficient housing for all. • Treatment facilities for sewerage of toilet and domestic wastes • In-house-community entertainment facilities.
	Public Health Related Impacts	• Traffic congestions and disruption to road users • Health impacts due to construction related dust and air emissions and wastewater/effluents release • Traffic-related air quality. • Traffic-related noise	• Health impacts due to air emissions and noise and effluents released. • Traffic-related air quality impacts. • Traffic-related noise impacts.	• Implement proper safety standards. • Provide personal protection equipment (PPE) for staff, such as safety shoes, helmets, masks, gloves, protective clothing, goggles, full—face eye shields, and ear protection. • Maintain the PPE under a regular checking and replacement program. • Provide safe and healthy work environment to workers, taking into account inherent risks in its particular construction activity and specific classes of hazards in the work areas.



	Occupational Health safety	• Accidents. • Effects on health of workforce. • Safety at work.	• Accidents. • Effects on health of workforce. • Safety at work.	• A traffic management plan will be developed by the construction contractor to prevent incidents of accidents which may occur due to transportation of machinery and equipment to the project site. • Undertake a full project community risk assessment followed by the development of a community emergency preparedness and response plan appropriate to its findings
	National and Regional Impacts	• Human resources development • Economic development at regional and national level	• Industrial development in Punjab and Pakistan • National and regional (Punjab) power cities • Impacts on regional and national air quality	• The increased government revenue could be used meet development objective by improving infrastructure and services in areas local to the project
	Global impacts	• Purchase of equipment and machinery from global market • Hiring the international contractors and consultants	• Green-house gas emission and climate change • Impacts on global air quality and global warming	• Maintenance of all construction machinery on regular basis • Use of machinery with appropriate exhaust system • In order to control the particle emission all stages filtering system, dust collectors or humidification or other techniques(as applicable) to the concrete batching and mixing plant will be provided.



8. ENVIRONMENTAL MANAGEMENT & MONITORING PLAN

8.1. Introduction

This section presents the environmental management plan (EMP) for the proposed project. The EMP specifies the mitigation and management measures which the Proponent will undertake and shows how the Project will mobilize organizational capacity and resources to implement these measures.

The EMP covers information on the management and mitigation measures that will be taken into consideration to address impacts in respect of the operational phase of project.

8.2. Objectives

The objective of the Environmental Management and Monitoring Plan (EMMP) is to address all the major environmental issues and provide framework for the implementation of the proposed mitigation measures during the operational phase of the project. The proper implementation of the EMP will ensure that all the adverse environmental impacts identified in the EIA report are adequately mitigated, either totally prevented or minimized to an acceptable level and required actions to achieve those objectives are successfully adopted by the concerned institutions or regulatory agencies.

The EMMP provides a delivery mechanism to address potential impacts of the project activities, to enhance project benefits and to introduce standards of good practice to be adopted for all project works. The EMMP has been prepared with the objectives of:

- Defining roles and responsibilities of the project Proponent for the implementation of EMMP and identifying areas where these roles and responsibilities can be shared with other parties involved in the execution and monitoring of the project.
- Outlining mitigation measures required for avoiding or minimizing potential impacts assessed in the EIA report.
- Developing a monitoring mechanism and identifying requisite monitoring parameters to confirm effectiveness of the mitigation measures recommended in the EIA report.
- Defining the requirements for communication, documentation, training, monitoring, management, and implementation of the mitigation measures.

8.3. Implementation of EMMP

The implementation of EMMP should be carefully coordinated with the design and operational program of the project. This will ensure the implementation of relevant mitigation measures at the appropriate project stages. It will also ensure that adequate resources are properly allocated to achieve the desired results. This EMMP has been prepared to satisfy the requirement of "IEE and EIA Regulations, 2022".



8.4. Management Approach and Responsibilities

The organizational roles of the key players are;

- The Developer will undertake overall responsibility for compliance with the EMMP. The developer will carry out regular monitoring to ensure that the contractors are effectively implementing their environmental and social requirements.
- Construction Contractor/s: The contractor/s will implement the majority of environmental and social mitigation and monitoring measures as required by their contract. The construction contractor/s is subject to certain liabilities under the environmental laws of the country, and under their contracts with the project developer.

The separate responsibilities of the developer and the contractor are:

8.4.1. Primary Responsibilities:

- Developer will coordinate with the concerned government departments and
- Respective highest-ranking officers of developer and the construction contractor will assume the primary responsibilities for environmental performance of the proposed Project.

8.4.2. Project Management and Quality Control:

- Developer representative will be responsible for the overall environmental soundness of all field operations; and
- The construction contractor's Site Manager will be responsible for carrying out the construction activities in an environmentally sound manner

Specific roles and responsibilities for monitoring are provided in Table 8-1.

Table 8-1 Roles and Responsibilities for Environmental Monitoring

Aspect	Project Developer	Contractor	Relevant Documentation
Contracting	Ensuring that monitoring and mitigation requirements are included in the contract between the developer and the construction contractor/s.	Understanding the requirements and estimating the required resources	Contract between the developer and the construction contractor/s.
Monitoring Plan	Ensuring finalization of Monitoring Plan before commencement of project construction.	Prepare a Construction Management Plan.	Finalized Monitoring Plan and Construction Management Plan.
Resources	Ensuring availability of resources required for environmental monitoring.	Ensuring availability Of resources Required for environmental management and monitoring	Project budgets
Environmental Staff	Designating an Environmental Manager for the Proposed Project	Designating an Environmental Manager for they Proposed Project (may be combined with health and safety)	Job Description



Monitoring Surveys and Inspections	Undertaking regular inspections Contactor's environmental performance and carrying out further measurements when necessary.	Undertaking regular inspections Contactor's environmental performance and carrying out Survey	Inspections and Survey Reports
Environmental Audit	Conducting periodic Audits of the construction site.	Conducting periodic internal audits.	Audit reports
Reporting	Ensuring that periodic environmental monitoring reports are received from the construction contractor/s	Producing environmental monitoring periodically distributing among the developer's management and appropriate staff members.	Environmental Monitoring Reports.
Corrective Actions	Verifying that activities carried out comply with the EIA/EMMP and identifying corrective actions if needed	Carrying out corrective actions as required.	Corrective actions record.
Maintenance of Records	Maintaining monitoring data and recording all incidents of environmental significance and related corrective measures.	Maintaining monitoring data and recording all incident of environmental significance and related corrective measures	Environmental Database

8.5. Mitigation Plan

The Mitigation Plan is a key component of the EMMP. The Mitigation Plan lists all of the mitigation measures identified in the EIA. Based on the EIA for the proposed Project, the mitigation measures for the construction phase are provided in Table 8-2 and for the operational / maintenance phase in Table 8-3.

Table 8-2 Mitigation Plan for Design & Construction Phase

Sr. No	Environmental or Social Aspects	Measure	Responsibility
1.	Design Stage Environmental Aspects	- Choice of appropriate land i.e. not major agriculture land - Choice of environmental friendly technologies - Provision of combined effluent treatment plant - Provision of treatment facilities like recovery and recycling units etc. - Proper sewerage and solid waste management system provision - Adequate roads, sewerage, drainage, electricity etc. in the design - Proper raising of road level to mitigate flood disaster	Developer & Design Consultant
2.	Construction Noise Control Plan	Periodic noise level surveys will be conducted for construction equipment's, operational machinery and vehicles. All high noise generating activities will be planned during the day time Use of horns will be banned and construction traffic will be kept to a minimum during night time	Construction Contractor Construction Contractor Construction Contractor



3.	Ambient Air Dust Control Plan	Frequency of sprinkling will be kept such that the dust remains under control.	Construction Contractor
		Water will be sprinkled on all open surfaces to control emission of dust	Construction Contractor
		Dust Emission from aggregate storage stockpiles and soil piles will be reduced by keeping the material moist by sprinkling of water at appropriate frequency or erecting windshield walls around the piles or covering the pile to reduce dust emission.	Construction Contractor
4.	Soil Erosion	Construction site will be appropriately marked	Construction Contractor
		The machinery movement will be restricted only to the construction area	
5.	Water Management	Measures for soil erosion control (e.g. silt fences, rip rap) will be carried out where necessary during construction	Construction Contractor
		The construction sites will be restored as close as possible to their natural (pre-project) conditions after completion of construction activities. For this purpose, a Site Restoration Plan will be prepared that may include the following: Removal of remains, extra construction material, equipment parts cable, or timber Disposal of extra soil Filling of all trenches and pits Repair to damaged or blocked drainage Soil erosion control measures where necessary	
6.	Waste Water Management	Potable Water Supply: The provision of drinkable water and safe drinking utensils at various points on the site.	Construction Contractor
		Water Conservation: a) To create awareness and boost the construction workforce to use water carefully and there is no water wastage. b) Negotiate the use of water for any purpose with the appropriate authorities and obtain written approval. c) The contractor will not collect/make use of water from any other source than those designated to them as suitable for use	
6.	Waste Water Management	The Contractor will submit a site design of wastewater management system as part of the environmental management plan for prior approval	Construction Contractor
		Water discharged from the works including effluent from sewage treatment, wash water and storm-water from workshops and refueling areas, as well as all runoff from areas with pollution potential will comply with Provincial effluent standards.	



		Plan the layout of batching areas, wash areas, and workshops with the following rules in mind: Improve the layout to lessen disturbance to the environment and to neighbors Concrete slabs need slope towards a conservancy tank so that run-off water can be collected. These tanks must be emptied, at least once in a week or when they are 60% full.	
7.	Solid Waste Management	Construction wastes on site must be reused or recycled when possible. The Contractor must familiarize themselves with the definitions of waste and the Construction handling, storage and transport as suggested in the applicable environmental Contractor legislation On site Integrated waste management will be carried out by applying, in preference Construction order of waste avoidance, reuse, recycling and disposal. Burning of waste material will not be allowed except under special conditions and with Construction earlier approval of the Site Manager. The appropriate facilities must be provided and maintained for waste collection (e.g. Construction bins) at specific locations around the site camp such as the office, garage, parking, Contractor housing facilities and locations where food is consumed.	Construction Contractor
8.	Storage and Handling of Hazardous Substances	Any spills will be rendered harmless and arrangements made for appropriate collection and disposal including cleaning materials, absorbents and contaminated soils To ensure that spill kits are available on site to clean the leaks and spills. To obtain storage and disposal permits / approvals necessary and comply with the conditions attached. To ensure that only nominated areas are used for the handling/storage of construction materials. The Contractor will be accountable for the training and education of all staff on site who must be handling the material about its proper use, handling and disposal as well as spill response. A contingency procedure will be developed for dealing of spills Hazardous chemicals used in construction must be kept in secondary containers. The relevant Material Safety Data Sheets (MSDS) must be provided on site. Appropriate and approved facilities for the storage and recycling of used oil and contaminated hydrocarbons must be provided.	Construction Contractor



8.6. Waste Management

The Construction contractor/s will be responsible for preparing a waste management A summary is provided in Table 8-4.

Table 8-4Waste Management Plan Summary

No.	Material Waste	Final Disposal Method	Associated Risk	Recommended Procedure
1.	Iron	- Material returned - To store as un-useable - Scrap Store - Recycling	Equipment and parts may be contaminated with oil or other liquids. This may pose hazards during recycling and/or melting,	Separate contaminated parts and ensure disposal contractor cleans and removes contaminations before recycling equipment.
2.	Copper	- Recycling - Scrap Store	Copper wires and tubes may be covered with insulation and may pose hazard if melted	Separate insulated copper from rest and ensure disposal contractor removes it before recycling.
3	Wood, Cotton, Plastic, Waste and Packing Materials	- Recycling - Landfill	Burning of wood, paper, plastic and other materials may cause air pollution Littering due to improper disposal	Ensure waste contractor disposes all non—recyclable plastic wastes and other non—recyclable materials at land disposal.
4.	Electronics	Material returned to store as un-useable	Some electronic equipment may contain toxic materials and pose a health risk if opened or dismantled.	Ensure contractor disposes equipment properly and equipment is opened only under guidance of qualified professional.
5.	Insulation	Material Re-used Landfill	Burning may cause air pollution. Littering due to improper disposal	Ensure contractor disposes insulation properly at landfill site.
6.	Oil	Recycling Contractors	May cause contamination of soil or waterways	Ensure properly certified recycling contractors are used.
7.	Concrete	Landfill or reuse for filling	None	Ensure safe storage till Disposal

8.7. Monitoring Plan

Environmental monitoring is a vital component of an EMMP. It is the mechanism through which the effectiveness of the EMMP is evaluated. Furthermore, the feedback provided by environmental monitoring is instrumental in identifying any problems and planning corrective actions.



Objective of Monitoring

The main objectives of environmental monitoring during the construction phase of the proposed Project will be to:

- To provide a mechanism to determine whether the project construction contractor/s and the developer are carrying out the project in conformity with the EIA and EMMP;
- To identify areas where the impacts of the proposed project are exceeding the criteria of significance and, therefore, require corrective actions.
- To document the actual impacts if the proposed project on physical, biological, and socio-economic/ cultural receptors, quantitatively where possible, in order to design better and more effective mitigation measures; and;
- To provide data for preparing the monitoring report to be submitted to the Punjab-EPA in accordance with the provincial and national legal requirement.

Performance Indicators

Environmental parameters that may be qualitatively and quantitatively measured and compared are selected as 'performance indicators' and recommended for monitoring. These performance indicators will be monitored to ensure compliance with the national or other applicable standards and comparison with the baseline conditions established. A summary of performance indicators, and their applicable standards to ensure compliance, include:

- **Construction Phase:**
 1. Noise levels: PEQS
 2. Wastewater quality: PEQS
- **Operation Phase:**
 1. Ambient air quality (NO₂, SO₂, PM₁₀ and PM_{2.5}): PEQS
 2. Noise levels: PEQS
 3. Wastewater quality: PEQS

8.8. Environmental Records

The following environmental records will be maintained:

- Periodic inspection reports of Contractor's Environmental Officer;
- Incident record of all moderate and major spills. The record will include:
 - Location of spill;
 - Estimated quantity;
 - Spilled material;
 - Restoration measures;
 - Photographs;



- Description of any damage to vegetation, water resource;
- Corrective measures taken, if any; and,
- Corrective measures taken, if any.
- Waste Tracking Register that will records of all waste generated during the construction and operations: period. This will include quantities of waste disposed, recycled, or reused;
- Survey reports, in particular, the following:
 - Soil erosion: Baseline survey, including photographs (or video), will be conducted to document pre-construction condition of the construction site,
 - Vehicle and equipment noise; and,
 - Ambient noise survey reports.

8.9. Environmental Training

Environmental training will help to ensure that the requirements of the EIA and EMMP are clearly understood and followed by all project personnel in the course of the project. The contractor will be primarily responsible for providing training to all project personnel. An environmental and social training program is provided in Table 8.5. This training program will be finalized before the commencement of the proposed Project.

Table 8-5 Framework for the Environmental and Social Training Program

Types of Training	Training Description	Training By	Personnel to be Trained	Period	Duration
Occupational Health and Safety	Training should be provided to aware staff to conform to safety	External Sources	OHS Manager	Before starting of project activities	Full day (8 hours session)
Occupational Health and Safety	Health, safety and hygiene proper usage of personnel protective equipment precautions to be taken for working in confined areas.	OHS Manager	Workers Staff	Before starting of project activities During Project activities	Full day (8 hours session)
Health, Safety and Environmental Auditing	Procedures to carry out Health, Safety and Environmental Audits Reporting requirements	External Sources	Staff responsible for inspection/ audits	Before starting of project activities	Full day (8 hours session)
Waste Disposal and Handling	Segregation, identification of hazardous waste, use of PPEs, waste handling	External Sources	Relevant workers Relevant Staff	Before starting of project activities	Full day (8 hours session)
Social & Environmental Laws & Regulations, norms, procedures and guidelines of Government	Environmental standards and their compliance Govt. regulations	External Sources	OHS staff managers & supervisor	Before starting of project activities	Full day (8 hours session)



Implementation of environmental management and monitoring plan	Concepts of environmental management and monitoring plan	External Sources	OHS staff managers & supervisor	Once in 3 months during the entire construction period.	Full day (8 hours session)
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8.10. Construction and Operation Management Plan

The construction contractor will develop a specific construction management plan (CMP) based on the CMP included in Table 8-6. The CMP will be submitted to DEVELOPER for approval. The CMP will clearly identify all areas that will be utilized during construction for various purposes, including:

- Areas used for camp;
- Storage areas for raw material and equipment;
- Waste yard;
- Location of any potentially hazardous material such as oil;
- Parking area; and loading or unloading of Material



Table 8-6 Impacts and Mitigation Measures during Construction & Operation Phase

Subject Area		Potential Impacts During Construction	Potential Impacts During Operation	Mitigation
Physical Environment	Air Quality	- Dust from construction activities. - Traffic-related air quality impacts.	- Effects of stacks emissions on ambient air quality. - Traffic-related air quality impacts. - Green House Gas emissions	- Watering of the material stockpiles, access roads and bare soils on an as required basis to minimize dust. - Increase the watering frequency during periods of high risk (e.g. high winds). - Stored materials such as gravel and sand should be covered and confined - Vehicles with appropriate exhaust systems will be used. - Maintenance of all vehicles on regular basis. - Establish and implement vehicle speed limits to minimize dust generation - Cover haul vehicles transporting dusty materials (cement, borrow) moving outside the construction site - Use of specified haulage routes and reduce vehicle speed where required. - Tuning of vehicles should be made mandatory to reduce the emissions of NOx, SOx, CO and PM10. - Haul-trucks carrying, earth, sand, aggregate and other materials should be kept covered during transportation of materials and during storage at site, with tarpaulin.



	Water Resources	- Control and management of site drainage. - Wastewater discharge, Sewage disposal and foul drainage - Effects on groundwater quality.	- Water requirements for operation - Discharge of process and wastewater. - Operation of drainage systems on site. - Discharge of storm water, sewage and drainage	- Stockpiles of potential water pollutants (i.e. oils, construction materials, fuel, etc.) shall be placed so as to minimize the potential of contaminants to enter local watercourses or storm-water drainage. - Preparation of Emergency Spills Contingency Plan. - Storm-water runoff from all fuel and oil storage areas, workshop, and vehicle parking areas is to be directed into an oil and water separator before being discharged to any watercourse. - Rainwater harvesting should be done on the roof top of the industrial buildings harvesting system. - The water conservation will also be adopted in industries.
	Soils, Geology and Topography	- Effects on soils and topographic features. - Soil contamination	Soil contamination during construction phase	- Ensure the topography of the final surface of all raised lands are favorable to enhance natural draining of rainwater / flood water - Restore the natural landscape of the construction sites after completion of work
	Land Use, Landscape and Visual Issues	- Impacts on existing land use on site. - Impacts on existing land use in the surrounding area. - Effects of construction activities on landscape character. - Visual impact of construction activities.	- Impacts on existing land use on site. - Impacts on existing land use in the surrounding area. - Effects on landscape character. - Visual impact of operating facilities.	- Stop work and inform the site manager immediately if, during construction, an archaeological or burial site is discovered. - It is an offence to restart work in the vicinity of the site until approval to continue is awarded by the plant management. - Resolve landscape change issue in consultation with local leaders and supervision consultants.



Ecological Environment	Flora	Loss of natural vegetation and crops	• Impacts on flora due to altered drainage and runoff patterns	• Removal of trees should be limited to the development footprint • Construction activities shall reduce the loss or disturbance of vegetation • Use clear areas to avoid cutting of trees • A procedure shall be prepared to manage vegetation removal, clearance and reuse • Inform the plant management before clearing trees
	Fauna	• Losses of habitat or species due to land take. • Disturbance or damage to adjacent habitat of species	• Disturbance or damage to adjacent habitat • Effects on birds migration routes	• Project should ensure the safety of various animals at construction and operation camp area.
	Economy Related Impacts	• Impacts on local skilled and un-skilled labor and businesses.	• Impacts on local labor and businesses	• The increased government revenue could be used to meet objective by improving infrastructure and services in areas local to the project.



	Social Settings and Services Related Impacts	- Demographic changes due to influx of people. - Pressure on existing infrastructure, utilities and services.	Small scale demographic and cultural changes.	- Safe, reliable water supply, Sufficient housing for all. - Treatment facilities for sewerage of toilet and domestic wastes - In-house-community entertainment facilities.
	Public Health Related Impacts	- Traffic congestions and disruption to road users - Health impacts due to construction related dust and air emissions and wastewater/effluents release - Traffic-related air quality. - Traffic-related noise	- Health impacts due to air emissions and noise and effluents released. - Traffic-related air quality impacts. - Traffic-related noise impacts.	- Implement proper safety standards. - Provide personal protection equipment (PPE) for staff, such as safety shoes, helmets, masks, gloves, protective clothing, goggles, full—face eye shields, and ear protection. - Maintain the PPE under a regular checking and replacement program. - Provide safe and healthy work environment to workers, taking into account inherent risks in its particular construction activity and specific classes of hazards in the work areas.



	Occupational Health safety	- Accidents. - Effects on health of workforce. - Safety at work.	- Accidents. - Effects on health of workforce. - Safety at work.	- A traffic management plan will be developed by the construction contractor to prevent incidents of accidents which may occur due to transportation of machinery and equipment to the project site. - Undertake a full project community risk assessment followed by the development of a community emergency preparedness and response plan appropriate to its findings
	National and Regional Impacts	- Human resources development - Economic development at regional and national level	- Industrial development in Punjab and Pakistan - National and regional (Punjab) power cities - Impacts on regional and national air quality	The increased government revenue could be used to meet development objective by improving infrastructure and services in areas local to the project
	Global impacts	Purchase of equipment and machinery from global market Hiring the international contractors and consultants	Green-house gas emission and climate change	- Maintenance of all construction machinery on regular basis - Use of machinery with appropriate exhaust system - In order to control the particle emission all stages filtering system, dust collectors or humidification or other techniques(as applicable) to the concrete batching and mixing plant will be provided.



			• Impacts on global air quality and global warming	
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8.11. Environment Management Team

Following functionaries will be involved in the implementation of EMMP:

- The project Proponent as owners of the EMMP.
- Project contractor(s) as executors of the EMMP during installation and operational phase of the project.

Operational & Maintenance (O&M) and the Health, Safety and Environment team of the project as an executor of the EMMP during the installation and operational phase of the project.

Table 8-7 List of Individuals and their Responsibilities

Sr.	Designation	Responsibilities
1	Sr. Manager HSE	HSE Supervision
2	Manager HSE	Ensure EMP implementation
3	Assistant Manager	Operational management and control
4	Dy. Manager	Supervision and monitoring



9. INVOLVEMENT OF STAKEHOLDER'S / PUBLIC CONSULTATION

9.1. Introduction

Stakeholder's consultation is a tool used for communication with a diverse group of stakeholders having multifarious aims such as information dissemination, exchanging views, soliciting feedback and suggestions on issues pertaining to the project, plan future actions. This practice initiates a need assessment and identifies areas of concern for all the parties that maybe affected by the project activities.

Stakeholders by definition are all those people and institutions who have an interest in the successful design, implementation and sustainability of the project. This includes those positively and negatively affected by the project.

9.2. Principles of stakeholders Consultation

For this EIA, the stakeholder's consultation activities were executed based on the following principles:

- Transparency;
- Openness;
- Accessibility; and,
- Inclusion.

9.3. Benefits and Objectives of Stakeholder's Consultation

Consultation with stakeholders leads to an overall better understanding of the project on the part of the communities and gives the Proponent a clearer understanding of the stakeholders' perspective. Effective public consultation can add substantial value to the EIA study process. The information gained through public consultation on the stakeholders' concerns, interests, and their ability to influence decision-making helps identify key cause of environmental problems.

This can be used to evaluate direct and indirect environmental impacts and assess short term and long-term resource use implications. The input from local communities and NGOs can help evaluate alternatives and strengthen the management planning by incorporating local input and know-how.

An informed public will better understand the tradeoffs between project benefits and disadvantages; be able to contribute meaningfully to the project design; and have greater trust with the project Proponent and support for the project, says the Asian Development Bank. These factors contribute towards improved project implementation sensitized to the human environment of the area. The objectives of stakeholders' consultation are to:

- Promote better understanding of the proposed operation through explaining its objectives and its potential positive and negative impacts.



10. CONCLUSIONS AND RECOMMENDATIONS

Based on master plan, preliminary design, environmental and social field surveys, and impact assessment of the proposed project, it may be concluded that although there are some significant negative impacts but would be of short term during the construction stage. However, there are few negative impacts that would be expected during the operational stage but their intensity can be reduced by taking appropriate measures. Environmental issues related to the project activities are summarized as under;

- Physical impacts like soil erosion, soil contamination, water contamination, air pollution, high noise level, etc. are; temporary nature during the construction stages.
- However, during the operational stage by adopting abatement technologies such as combined effluent treatment plant (activated sludge system), air bags, electrostatic precipitators, development of buffer zones and green areas the intensity of negative impacts could be minimized to acceptable thresholds. Detailed Impacts and mitigation measures have been discussed in the Environmental Management plan.
- During operational stages the disposal of waste will become a problem. Therefore, a proper mitigation has been adopted in the preliminary design including wastewater treatment plant, safe and environmental friendly disposal of solid waste and control of gaseous emissions at source. The standards to be followed both for wastewater treatment and gaseous emissions ben discussed and reported.
- Social issues like safety of general public and workers, security problems, community accessibility issue, women accessibility to fields for their daily routine life etc. will be of temporary nature and proper mitigations have been provided in EMP. A comprehensive EMMP has been developed identifying the impacts, mitigation measures, agencies responsible for implementation, monitoring and auditing of the proposed measures.
- Mitigation measures have been suggested for each negative impact resulting from plant activities.
- Proper mitigations may be adopted in the preliminary design including safe and environmentally friendly disposal of solid waste.
- Physical impacts like soil contamination, water contamination, air pollution, high noise level, etc. are of temporary nature. However, during the operational stage by adopting abatement technologies and development of buffer zones and green areas, intensity of negative impacts can be minimized.
- All the baseline environmental parameters including ambient air and noise are well within the permissible limits of NEQS.
- The other social issues like safety of public and workers, security problems, community



Appendices-IV: References

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- Punjab Environmental Quality Standards for Noise.
- The Canal and Drainage Act, 1873.
- The Punjab Plantation and Maintenance of Trees Act, 1974.
- The Punjab Wildlife (Protection, Preservation, Conservation and Management) Act and Rules, 1974.
- Information and data provided by the project proponent.
- Technical design data related to the project.
- Information gathered through discussions with the project related persons of the project proponent.
- 29. "Guidelines for Self-Monitoring and Reporting by the Industry (SMART)," Final Report, March 1998, approved by PEPC, August 1999
- https://mnem.punjab.gov.pk/important_minerals_occurring_in_punjab#14
- <https://en.wikipedia.org/wiki/Marl>



Appendices-V: Terms of Reference of Environmental Reports

TERMS OF REFERENCE FOR EIA REPORT

The agreement hereinafter called Agreement, is made between M/s Hi-Tech Environmental Services (Pvt.) Ltd. (Consultancy Firm/Consultant) and Capital development Zone Pvt. Ltd (Developer) to prepare and carry out follow up of Environmental Study Report for obtaining Environmental approval under Section 12 of Punjab Environment Protection Act 1997 (Amended 2017) for proposed project of **"DEVELOPMENT OF CAPITAL SPECIAL ECONOMIC ZONE BY CAPITAL DEVELOPMENT ZONE PVT. LTD NEAR NEELA DULLAH INTERCHANGE, CHAKWAL"**.

The client has requested the consultancy firm to provide consultancy service to prepare and follow up of EIA Report and so that client may obtain Environmental Approval from EPA, Punjab under the Section 12 of PEPA 1997 (As Amended 2017) so mutually agreed terms and conditions are as under:

NOW THEREFORE, the parties here to hereby agree as follow:

- The client shall provide assistance and access to the information contained in the feasibility study, layout plan and other project relevant documents as and when required by the consultancy firm/consultant for performance of his obligations.
- The client shall provide all available data, maps, reports, etc. about the project including but not limited to layout plan of the project. Client will provide Lab Test Reports from EPA certified lab including noise level monitoring, wastewater analysis and air emissions report or any report/document/information demanded by the EPA.
- The client will provide to the consultancy firm with the letter of introduction and authorization and other documents as may be needed to enable consultancy firm consultant to perform the service.
- Responsible to pay all the dues of the consultants as per the agreed terms and conditions.
- The consultancy firm/consultant shall carry out the services in accordance with the provisions of the agreement including:
- Shall follow up the EIA/EIA Report and other file required with due diligence necessary/required for obtaining its approval from EPA Punjab under the statutory requirements of PEPA 1997 (amended in 2017).
- Shall give the consultancy for the preparation of the detailed Environmental Management & Monitoring Plan for enhancing the environmental conditions during installation and operational phases such as mitigation measures for wastewater, solid waste, air emissions, plantation, management of surface runoff, mitigation of socially adverse impact, if any.
- Will evaluate all the activities during the installation and operational phases and recommend suggestions/actions to comply with PEQS.



- Will follow up the EIA/EIA Report and file documents considering information/documents provided by the client.
- Shall examine the entire activities and list of the details of activities likely to cause adverse impacts during and after installation phase.
- Shall suggest mitigation measures for all such activities which may cause adverse impacts.

For and Behalf of

M/s Hi-Tech Environmental Services (Pvt.) Ltd.
(Consultancy Firm/Consultants)

For and Behalf of

Capital Development Zone Pvt. Ltd.
(Proponent)



The team carrying out the research project is presented in the Table:

Sr.	Name	Qualifications & Brief Experience	Roles Assigned
1.	Engr. Harris Naeem	M.Sc. Mining Engineering	• Director operations • Mining Techniques
2.	Ch. Awais Ahmad	LLM (London)	• Site Visits • Legal Reviews • Coordination with Locals
3.	Razi Allah	BS Hon. Environmental Sciences	• Environmental Compliance Officer • MBA, FCCU & Cranfield UK • BS (Hons). Environmental Science & Geography (GIS), FCCU Lahore (TQM ISO 14001)
4.	Attika Hameed	Environmental Scientist PhD Scholar	• Preparation of Environmental Management Plan (EMP) • Preparation of Environmental Monitoring Plan (EMP) • Author of EIA Report
5.	Engr. Maryam Nazir	Mining Engineer and GIS Management B.Sc. Mining Engineering	• Development of Maps • Secondary data collection • Compilation of report • Coordination with the team



Hi-Tech Environmental Services (Pvt.) Ltd.
Environmental Impact Assessment for Capital Development Zone Pvt. Ltd.
Development of Capital Special Economic Zone Near Neela Dullah interchange, District, Chakwal

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Appendices-VII: Lab Reports



 **ENVIRONMENTAL PROTECTION AGENCY**
GOVERNMENT OF THE PUNJAB
National Hockey Stadium, Gate No. 08
Gaddafi Stadium Complex, Lahore 

Validation No 1085-A Dated: 03-06-2024

Validation for Stack & Ambient Monitoring / Sampling

Emission Monitoring under CTM-34 or OTM-39			
Facility Name & Address	Capital Development Zone Pvt. Ltd.	Ambient Air & Boundary Wall Noise	
Phone	Locate at Neela Dullah Interchange, District Chakwal		
Industry Category	Baseline		
Analyzer Model & Make:	<i>CAQMS & Noise Level meters</i>		
Average stack emission values of CO, NOx (in mg/nm3)			
Excess Air / Excess Oxygen (%age):-			
Analyzer exposed for Ramp-Up phase to the sample gas for 5 minutes	Yes	No	NA✓
Analyzer flow rate and EC temperature monitored during calibration and testing	Yes	No	NA✓
Test Data Phase of sample gas recorded with 15 second interval	Yes	No	NA✓
All key requirements to ensure QA/QC complied for said EPA approved Method	Yes	No	NA✓
Particulate Matter (PM) Monitoring / Sampling under USEPA Method 5 / 17			
Model & Make of Iso-kinetic PM Assembly			
The PM sampling train is complete as per Method 5 & 17	Yes	No	NA✓
Leak Test performed prior to sampling	Yes	No	NA✓
Field data Sheet for PM Sampling filled during PM sampling	Yes	No	NA✓
Data for determining of "K" factor & "DGM" "Y" Factor filled during sampling	Yes	No	NA✓
All method key requirements during sampling were complied to ensure QA/QC	Yes	No	NA✓
Filter of Particulate matter is suitable for metal Testing	Yes	No	NA✓
SOx sampling as per Method 8 (Thorin Indicator Method)			
The right absorbent solution are available for SOx Sampling	Yes	No	NA✓
The equipment is capable to maintain flow rate @ 2.0LPM or as per method 8 requirement	Yes	No	NA✓
Sampling for SOx is performed as per method	Yes	No	NA✓
Ambient Air Quality Monitoring by Automatic Monitors for CO, O3, SO2, NOx, PM2.5 & PM10			
In case of continuous monitoring at a site, One Point QC Check Single analyzer & Zero/span check is performed every 14 days.	Yes	No✓	NA
The CE of NOx analyzer is ensured to be maintained within 96% - 104.1%	Yes	No✓	NA
Zero/span check is performed prior to starting ambient monitoring	Yes	No✓	NA
All key requirements for Critical & Operational Criteria for ambient air monitoring by automatic monitors were complied during monitoring	Yes✓	No	NA
The measuring techniques of monitors comply PEQS	Yes✓	No	NA
Ambient Air Sampling of SPM, PM10, Pb by High Volume Sampler			
In case of Sampling for SPM through samplers, the flow rate of sampler comply PEQS (1.1m3/min).	Yes✓	No	NA
Calibration of Sampler performed prior to sampling	Yes	No	NA
Vehicular Emissions & Noise Measurement			
Sampling of Vehicle emissions and noise measurement have been performed as per method and SOPs	Yes✓	No	NA

Remarks (if Any):-

Signature _____
Name of EPA Officer with office Address
RAs / ROs / DD(Labs)

Adil Javed - Pak Green Lab
Dated: 25-05-2024
Signature _____
Name of Assistant / Deputy Analyst, Analyst
with Name of Private Lab along with Address





**ENVIRONMENTAL PROTECTION AGENCY**
GOVERNMENT OF THE PUNJAB
National Hockey Stadium, Gate No. 08
Gaddafi Stadium Complex, Lahore

Validation No 1085-B Dated 03-06-2024
Validation for Wastewater & Drinking Water

Facility /Project Name & Address Phone	Capital Development Zone Pvt. Ltd.		Sampling Point Ground Water				
	Locate at Neela Dullah Interchange, District Chakwal						
Waste Water (WW) Treatment facility		Drinking Water (DW) Treatment Facility					
Primary Secondary Tertiary NA		Total Collected Drinking water samples 01					
Total WW collected Sample NA		Sample Tag for testing parameter is assigned on sample container					
Sample is preserved properly for each testing parameter		Yes✓ NO NA					
Sample size is adequate for testing the target parameters		Yes✓ NO NA					
Wastewater Flow Measurement performed to ensure sample representativeness		Yes NO✓ NA					
No. of Waste Water outlets	Waste Water Flow m ³ /hr from each outlet (Optional)	Water intake m ³ /hr (Optional)	Water Mass balance complied during sampling (Optional)	Sample Type			
	NA	NA	Yes No	Grab✓ Composite			
Parameter	Matrix W WW	Container	Sample Size	Preservation	Yes	NO	NA
Coliform, Total or Fecal		Sterile Container	100 mL	Refrigerate 6°C			
Coliform, Total or Fecal, Chlorinated Water	✓	Sterile Container	100 mL	0.008% Thiomylphate & cooled 6°C	✓		
Color, Turbidity	✓	P.G	500 mL	Cool 6°C	✓		
Hardness, Total	✓	P.G	500ml	HNO ₃ to pH<2	✓		
Nitrogen, Nitrate + Nitrite, Phenolic Compounds, Oil & Grease, COD, NH ₃		P.G	2000 mL	H ₂ SO ₄ to pH < 2, Cool 6°C			
Metals, General		P.G Rinsed 1:1 HNO ₃	500 mL	HNO ₃ to pH < 2			
Cyanide, Total		P.G	500 mL	NaOH to pH > 12, Cool 6°C			
Pesticides, General		Glass	1 Liter	Cool 6°C			
Field Parameters*							
Field parameter		pH meter, Model Make	Measurement Method	Calibrated in Field	Measured value		
pH		AS 21B	APHA 4500 B	Yes✓ NO			
Temp							
Cl							

* Field testing parameters only be validated by RAs, ROs, DD (Labs)

Remarks for Sample Quality (if Any):-

Research Officer
Signature: 
Name of EPA Officer with Office Address
Inspectors / RAs / ROs or ADs / DDs

Adil Javed - Pak Green Lab
Dated: 25-05-2024
Signature: 
Name of Assistant /Deputy Analyst, Analyst
with Name of Private Lab along with Address





**PAK GREEN ENVIRO-ENGINEERING (Pvt.) Ltd.**
ISO/IEC 17025:2017 Accredited Testing Lab, ISO 9001:2015, ISO 14001:2015, ISO 45001:2018
Head Office: 46-M, Gulberg III, Lahore-Pakistan. Ph: +9242-35441444 Cell: 0303-4442334
PGG/IMS/FF/063 Rev #02 Rev date: 04-09-23
EPA Certified
Ref #: PGG/LAB/2024-5811/AA Issue date: 03-June-24

TEST REPORT

Name of Industry/Client: M/S Capital Development Zone Pvt. Ltd.
Address of monitoring site: Development of Capital Special Economic Zone Locate at Neela Dullah Interchange, District Chakwal
Nature of Monitoring: Ambient Air
Monitoring Instrument: AQMS
Monitoring Date: 25-May-24 to 26-May-24
Validated by EPA Representative: Muhammad Nadeem, RO EPA(Lab), Lahore

Results:

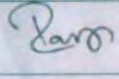
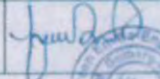
Parameters	CO mg/m ³	NO µg/m ³	NO ₂ µg/m ³	SO ₂ µg/m ³	PM ₁₀ µg/m ³	PM _{2.5} µg/m ³
Methodology	Non-Dispersive Infrared Absorption (NDIR)	Reduced Pressure Chemiluminescence (CLD)	Reduced Pressure Chemiluminescence (CLD)	UV fluorescence (UVP)	Integrated Sampling Technique	Integrated Sampling Technique
Results	1.25	18.67	23.96	47.48	142.4	41.8*
PEQS for Ambient Air	05 8-Hrs	40 24-Hrs	80 24-Hrs	120 24-Hrs	150 24-Hrs	35 24-Hrs

End of Report

PEQS: Punjab Environmental Quality Standards
Remarks: All Parameters are in compliance with PEQS Limits except PM_{2.5}.

Terms & Conditions:

- Analysis was conducted on the request of project proponent for IEE/EIA Baseline study.
- Report cannot be used regarding compliance of any complaint, EPO or any other court case.
- This report should be reproduced as a whole and not in parts.
- The responsibility of the ethical use of the results reported in this report lies with the client. Consequently, the laboratory is absolved of its responsibility for any claim that may result through the use by the client or others of the results appearing in this report.
- The left-over sample (if so available) shall be retained for fifteen days after the issuance of the report unless otherwise negotiated between the client and the laboratory.
- The report is not valid for any negotiations.

Field Analyst	Chief Analyst	Laboratory Incharge
		



Page 1 of 1



info@pakgreen.pk pakgreen@hotmail.com www.pakgreen.pk



 **PAK GREEN** ENVIRO-ENGINEERING (Pvt.) Ltd.
ISO/IEC 17025:2017 Accredited Testing Lab, ISO 9001:2015, ISO 14001:2015, ISO 45001:2018
Head Office: 46-M, Gulberg III, Lahore-Pakistan, Ph: +9242-35441444 Cell: 0303-4442334
EPA Certified
Ref #: PGG/LAB/2024-5810/NL
TEST REPORT
Issue date: 05-June-24
PGG/IMS/FF/063 Rev.#02 Rev.date: 04-09-23

Name of Industry/Client: M/S Capital Development Zone Pvt. Ltd.
Address of monitoring site: Development of Capital Special Economic Zone Locate at Neela Dullah Interchange, District Chakwal
Nature of Monitoring: Noise Level
Monitoring Time: Real Time
Monitoring Instrument: Land TEK SL 5866-P
Monitoring Date: 25-May-24
Validated by EPA Representative: Muhammad Nadeem, RO EPA(Lab), Lahore

Results:

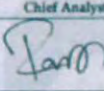
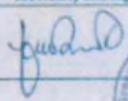
Sr. No.	Locations	Equivalent Noise Level dB (A)
1.	Point-01: East Side	61.4
2.	Point-02: West Side	57.1
3.	Point-03: North Side	58.2
4.	Point-04: South Side	61.3
FEQS (Day Time Commercial Area)		65 dB(A)

End of Report.

FEQS: Punjab Environmental Quality Standards
Remarks: Noise level at all points are in compliance with FEQS Limit.

Terms & Conditions:

- Analysis was conducted on the request of project proponent for IEE/EIA Baseline study.
- Report cannot be used regarding compliance of any complaint, EPO or any other court case.
- This report should be reproduced as a whole and not in parts.
- The responsibility of the ethical use of the results reported in this report lies with the client. Consequently, the laboratory is absolved of its responsibility for any claim that may result through the use by the client or others of the results appearing in this report.
- The left-over sample (if so available) shall be retained for fifteen days after the issuance of the report unless otherwise negotiated between the client and the laboratory.
- The report is not valid for any negotiations.

Field Analyst	Chief Analyst	Laboratory Incharge
		



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PAK GREEN ENVIRO-ENGINEERING (Pvt.) Ltd.
ISO/IEC 17025:2017 Accredited Testing Lab, ISO 9001:2015, ISO 14001:2015, ISO 45001:2018
Head Office: 46-M, Gulberg III, Lahore-Pakistan. Ph: +9242-35441444 Cell: 0303-4442334
EPA Certified PGG/IMS/FF/159 Rev. #00 Rev date: 04-09-23

TEST REPORT
Ref #: PGL/LAB/2024-3812/GW Issue date: 03-Jun-24

Name of Industry/Client: M/S Capital Development Zone Pvt. Ltd.
Address of monitoring site: Development of Capital Special Economic Zone Located at Neela Dullah Interchange, District Chakwal
Nature of Sample: Ground Water
Sampling By: Pak Green Laboratories
Sample Code: GW-1465
Sample Source: Motor Pump
Date of sampling: 25-May-24
Sample Receiving Date: 25-May-24
Testing Facility: Pak Green Laboratories
Testing Date: 25-May-24 to 03-Jun-24
Validated by EPA Representative: Muhammad Nadeem, RO EPA (Lab), Lahore

Sr. No.	Parameters	Unit	WHO	FEQS	Method / Technique	Results
1.	Taste	-	≤ 15	≤ 15	APHA-2160 C	Non-Objectionable
2.	Odor	-	Non-Objectionable / Acceptable	Non-Objectionable / Acceptable	APHA-2150 B	Non-Objectionable
3.	Color	TCU	Non-Objectionable / Acceptable	Non-Objectionable / Acceptable	APHA-2120 C	0.000
4.	Turbidity	NTU	< 5	< 5	APHA-2130 B	0.50
5.	Total Hardness ^A	mg/L	-	< 500	APHA-2540 C	70
6.	Total Dissolved Solids ^A	mg/L	< 1000	< 1000	APHA-2540 C	719
7.	pH ^A	-	6.5-8.5	6.5-8.5	APHA-4500-HP B	7.260 at 23.0°C
8.	Chloride (Cl ⁻) ^A	mg/L	250	< 250	APHA-4500-Cl ⁻ B	31
9.	Electrical Conductivity (EC) ^A	µS/cm	-	-	APHA-2510 B	1024
10.	Sodium (Na) ^A	mg/L	-	-	APHA-3111 B	119.5264

End of Report
FEQS: Punjab Environmental Quality Standards WHO: World Health Organization ^A PNAC Accredited
Remarks: All Parameters are not in compliance with the FEQS Limit.
Terms & Conditions:
• Analysis was conducted on the request of project proponent for EEE/EIA baseline study.
• Report cannot be used to comply with any complaint, EPC, or other court case.
• This report should be reproduced as a whole and not in parts.
• The values represent the sample conditions when sampling/monitoring was carried out.
• The Environmental Conditions while performing testing activities are (Temp=22.6-23.8°C) and (RH=52.9-59.9%).
• The Sampling was done as per the sampling and preservation protocol method APHA 1060-B4C.
• The responsibility of the ethical use of the results reported in this report lies with the client.
• The leftover sample (if so available) shall be retained for fifteen days after the issuance of the report unless otherwise negotiated between the client and the laboratory.
• The report is not valid for any negotiations.
• Dually calibrated instruments were used during monitoring and testing activities.

Lab. Analyst	Chief Analyst	Laboratory Incharge



Appendices-VIII: Plantation Estimates

The development of green belts serves not only as foreground and background landscape features, resulting in harmonization by amalgamating the physical structures of the project site with the surrounding environment, but also functions as a pollution sink.

▪ **Objectives**

It is necessary to develop green belt in and around the project site with suitable plant species to achieve following objectives:

- To combat the air pollution effectively.
- To improve the quality of local as well as regional air.
- To avoid problems of soil erosion, noise and dust etc.

There will be no tree cutting at site due to project operations. Hence, there will be no disturbance to vegetation. In addition, the proponent will do plantation as a potential environmental enhancement measure.

Following plantation plan will be followed during project's lifecycle.

Item	Description
Spacing between two plants	2.0m×2.0m
Total plantation duration	Till Project Tenure
Total no. of samplings planted	100/- No.s.
Species of plants may be planted	Ornamental Plants/Indigenous Species

Noted that the plantation will start from first year and will only be carried out till project period subjected to the agreement between proponent and consultant and consent of the landowner.

• **Criteria for Selection of Plants Species**

The plant species will be planted based on their ease of availability in the local market and their suitability of growth in the project area. Mostly indigenous species will be preferred.





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Appendices-IX: Master Plant of the Project



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