



FDI TECHNOLOGIES PRIVATE LIMITED

**IT Racks, Power Cabinets, Cable Trays & Powder Coating
manufacturing Unit**

At Plot # 15, Phase-1A, M-3 Industrial City Faisalabad

Environmental Impact Assessment (EIA) Report



Lahore Office: 231-G, Johar Town, Lahore
E-mail: eprofessional07@gmail.com

Table of Contents

Executive Summary	I
1 Introduction.....	1
1.1 Purpose of Report.....	1
1.2 Identification of Project and Proponent	2
1.3 Details of Consultant	2
1.4 Brief Description of Nature Size and Location of Project	2
2 Screening of Project.....	4
3 Scoping of Project	5
3.1 Spatial and Temporal Boundaries of Environmental Assessment	5
3.2 Important Issues and Concerns Raised During Consultation.....	6
3.3 Significant Impacts and Factors to be Considered	6
4 Consideration of Alternatives	7
4.1 Site alternativea their selection and rejection criteria	7
4.2 Design / technology alternatives, their selection and rejection criteria.....	7
4.1.1 Material Alternatives and their Selection Criteria	7
4.3 Economic alternatives, their selection and rejection	10
5 Description of the Project.....	12
5.1 General	12
5.2 Objective of Project.....	12
5.3 Location of Project	12
5.4 Land Use	12
5.5 Vegetation Features on the Site.....	12
5.6 Road Access	13
5.7 Cost and Magnitude of Operation	13
5.8 Schedule of Implementation.....	13
5.9 Energy	14
5.10 Availability of Water.....	14
5.11 Description of Project Process	16
5.11.1 Raw Material.....	16
5.11.2 Cutting.....	16
5.11.3 Bending.....	17
5.11.4 Welding.....	17
5.11.5 Coating.....	17
5.11.6 Packaging & Loading	17
5.11.7 Machinery in the Operational Phase	18
5.11.8 Equipment and Vehicles in Construction Phase	18
5.11.9 Construction Materials.....	18
5.12 Restoration/Rehabilitation at the end of Project Life.....	19
5.13 Government Approvals	19
6 Description of the Environment	22
6.1 Baseline Study of Project Area	22
6.2 Study Area.....	22
6.3 physical environment	22
6.3.1 Topography and Geology	22
6.3.2 Soil:	23
6.3.3 Climate:.....	24
6.3.4 Dust Storm:	27

6.3.5	Seismology:.....	27
6.3.6	Surface water:	27
6.4	Baseline Ecological Environment:	27
6.4.1	Biodiversity:.....	27
6.4.2	Wildlife:	28
6.4.3	Flora:	28
6.4.4	Fauna:.....	28
6.4.5	Major Crops:	28
6.4.6	Major Fruits:	28
6.4.7	Main Vegetable:.....	28
6.4.8	Fishery and Aquatic Biology:	28
6.5	Baseline Socioeconomic Environment:	28
6.5.1	Administrative Boundaries:	28
6.5.2	Economy of Faisalabad:.....	29
6.5.3	Demography:.....	30
6.5.4	Culture:	30
6.5.5	Festivals:	31
6.5.6	Literacy:	31
6.6	Quality of Life:.....	32
6.6.1	Industries.....	32
6.6.2	Roads:	32
6.6.3	Buses:.....	32
6.6.4	Rail:.....	33
6.6.5	Air Traffic:	34
6.6.6	Education System:	34
6.6.7	Public Libraries and Museums:	35
7	Impact Assessment.....	48
7.1	Problems and its Occurrence	48
7.2	Ways of Achieving Mitigation Measures.....	48
7.2.1	Changing in Planning and Design.....	48
7.2.2	Improved Monitoring and Management Practices.....	48
7.2.3	Compensation in Money Terms.....	48
7.2.4	Replacement, Relocation and Rehabilitation.....	48
7.3	Characteristics of Impacts	51
8	Screening of Potential Environmental Impacts and Mitigation Measures.....	52
8.1	Environmental Problems Due To Installation at Present Location of Project	52
8.2	Project Design Related Environmental Problems	52
8.3	Environmental Problems Associated with Construction.....	52
8.4	Mitigation measures of impacts on air and noise.....	53
8.5	Environmental Problems during project operation	54
8.5.1	Duct & Bends.....	54
8.5.2	Stack (Chimney)	54
8.5.3	Air Emissions.....	54
8.6	Potential Environmental Enhancement Measures.....	55
8.6.1	Air Pollution Control System.....	55
8.6.2	Water Management.....	55
8.7	Impacts on Socio-economic Environment	56
9	Environmental Management and Monitoring Program	62
9.1	Environmental Management Plan (EMP)	62
9.1.1	Objectives of EMP.....	62

9.1.2	Structure of EMP	62
9.2	Project Implementataion Institutional Requirements	63
9.3	Environmental Management Team along with their Roles and Responsibilities	63
9.4	Proposed EMP Reporting and Reviewing Procedures	64
9.4.1	Reporting.....	65
9.4.2	Review and Update	65
9.5	Any Training need to Require to Ensure Implementation of EMP and Monitoring Plans	65
9.6	Environmental Management Plan for Construction and Operation Phase.....	66
9.7	Environmental Monitoring Program	77
9.8	Environmental Budget.....	78
9.9	Tree Plantation	78
9.9.1	Planning of Site for Plantation.....	78
9.9.2	Choosing Species	78
9.10	Green Belt Design	80
9.10.1	Lawn Planting	80
9.10.2	General Landscape Protection	80
9.11	Emergency Response PLaN & Evacuation Exit Plan	81
9.11.1	Objective of Emergency Response Plan	81
9.11.2	Scope of Emergency Response Plan.....	81
9.11.3	Emergency Situations	81
9.11.4	General Evacuation Procedure.....	82
9.11.5	Fire Emergency Response Plan	82
9.11.5.1	Special Fire Emergency Response and Fire-protection precautions	83
9.11.5.2	Supportive Services	84
9.12	Personal Protective Equipments (PPE'S).....	84
10	Stakeholders Consultation	87
10.1	Proponent Environment Management Team.....	87
10.2	The Responsibility Authority	87
10.3	Other Departments and Agencies.....	87
10.4	Environmental Practitioners and Experts.....	87
10.5	Affected and Wider Community	88
11	Conclusions and Recommendations	91
	References.....	92
	Terms of References	94
	Glossary	97

List of Acronyms

EA	Environmental Approval
EIA	Environmental Impact Assessment
EMMP	Environment Mitigation and Monitoring Plan
EMP	Environmental Management Plan
EPA	Environmental Protection Agency
EPC	Environmental Protection Council
Ft	Feet
GoP	Government of Pakistan
HSE	Health Safety Equipment
IEE	Initial Environmental Examination
LAA	Land Acquisition Act
M&E	Monitoring and Evaluation
MSW	Municipal Solid Wastes
NCS	National Conservation Strategy
PEQS	Punjab Environment Quality Standards
NGOs	Non–Government Organizations
NOC	No Objection Certificate
OHS	Occupational Health and Safety
Pak–EPA	Pakistan Environment Protection Agency
PKR	Pak Rupees
PM	Project Manager
PPC	Pakistan Penal Code
PPE	Personal Protective Equipment
QA	Quality Assurance
SHE	Safety Health& Environment
VOC	Volatile Organic Compounds

List of Figures

Figure 3-1 Location Site of Proposed Project.....	5
Figure 5-4 Location Map of Project Site (Source: Google Earth)	15
Figure 5-7 Types of Raw Material (Picture Courtesy Google Images)	16
Figure 6-1: Location of Project Area	22
Figure 6-2: Soil Map of Punjab	24
Figure 6-3: Average Temperature Graph of Faisalabad	25
Figure 6-4: Average Pressure Graph of Faisalabad	25
Figure 6-5: Climate Data of Faisalabad	25
Figure 6-6: Route of Lower Chenab Canal.....	27
Figure 6-7 Map of Faisalabad District	29
Figure 6-8 Faisalabad Art Council.....	31
Figure 6-9 Faisalabad Lari Ada	33
Figure 6-10 Faisalabad Railway Station	34
Figure 6-11 Faisalabad International Airport	34
Figure 6-12 University of Faisalabad	35
Figure 6-13 Allama Iqbal Library.....	36
Figure 7-1 Impact Characterization	51
Figure 8-7 Septic Tank.....	55

List of Tables

Table 6-1: Climate Data of Project Area	26
Table 7—1 Anticipated Impacts and their magnitude of the Project.....	49
Table 9—1 Members of Environmental Management Team	63
Table 9—2 Environmental Management Plan of FDI Technologies (Pvt) Ltd (During Construction Phase)	67
Table 9—3 Environmental Management Plan of FDI Technologies (Pvt) Ltd (During Operation Phase).....	72
Table 9—4 Environmental Monitoring Plan	77
Table 9—5 Summary of EMP Cost	78
Table 9—6 Fire Extinguishing Methods.....	84
Table 9—7 List of Important Protection Equipment (PPE's).....	85

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

I. Title and Location of Project

The title of the project is “FDI Technologies Pvt. Ltd.. (Installation of IT Racks, Power Cabinet, Cable Trays and Powder Coating Manufacturing unit)”. The project site is located at Plot # 15, Phase-1A, M3 Industrial City Faisalabad.

II. Name of the Contact Person

Muhammad Rizwan Chughtai

Contact #: +92-300-1757979

E-mail: Rizwan.chughtai@GROUPEFDI.com

III. Name of Organization Preparing the Report

Environmental Professionals & Associates

Head Office: 231-G, Johar Town Lahore.

Email: eprofessional07@gmail.com

IV. A Brief Outline of the Proposal

Proposed project involves the installation of FDI Technologies Pvt. Ltd. at Plot # 15, Phase-1A, M3 Industrial City Faisalabad with total area of 432844,000 Square Feet approximately. The M/S FDI Technologies Pvt. Ltd will conduct business with best practices for the manufacturing of IT Racks, Power Cabinet, Cable Trays & Powder Coating material. The production capacity of fabrication unit will be 136000 units per year while the production capacity of powder coating is 25 tons per month.

A brief outline of project is given below:

<u>BRIEF OUTLINE OF THE PROJECT</u>	
Land Available	432,824 Square Feet
Project Estimated Cost	550 Million Rupees
Capacity of the Project	The production capacity of fabrication unit will be 136,000 units per year while the production capacity of powder coating is 25 tons per month.

In compliance with the legal requirement of Section-12 of Punjab Environment Protection Act-2012, the proponent is required to submit the Environmental Impact Assessment (EIA) report before the commencement of the proposed project, therefore, Environmental Impact Assessment (EIA) report is being submitted to the Environmental Protection Agency (EPA), Government of the Punjab, Lahore.

V. The Major Impacts

The potential impacts and their magnitude from the cutting, bending and welding of metal sheets and associated facilities on the natural resources and environment of the site and vicinity are summarized in table E-1:

Table E-1: Impact Characterization (Unmitigated)

Impact	Nature	Duration	Geo-Extent	Reversibility	Likelihood	Consequence Severity/Utility
Physical Impact						
Air Quality	D	ST	LO	RE	LK	MN
Ground Water	ID	LT	LO	IR	PO	MO
Water consumption and water availability	D	ST	LA	RE	PO	MN
Biological Impacts						
Natural Vegetation	D	LT	LO	RE	PO	MO
Wildlife	D	LT	LO	IR	PO	MO
Social and Socio economic Impacts						
Traffic Congestion	D/ID	ST	LO	RE	PO	MN
Noise and Vibration	D	LT	LO	RE	CE	MO
Safety Hazards	D	ST/LT	LO	RE/IR	CE	MU
Employment	D	LT	LO/LA	RE/IR	CE	MU
Infrastructure	D/ID	LT	LO/LA	RE/IR	CE	MO
Public Health and Nuisance	D	ST/LT	LO	RE/IR	LK	MN

D: Direct;	ID: Indirect	CE: Certain;	LK: Likely
LT: Long Term;	ST: Short Term	PO: Possibly;	MN: Minor
MJ: Major;	MT: Medium Term	MO: Moderate;	LO: Local
LA: Large;	SV: Severe	RE: Reversible;	IR: Irreversible

VI. Recommendations for Mitigation Measures

Table given below shows the project impacts; related with construction and operational phase of the project.

Table E-2: Impacts and their Mitigation Measures

Impacts	Magnitude	Recommendation Measure	Responsible Authority
Construction Phase			
Air Pollution Dust generation from site and Gases emissions from vehicles	Minor	- Sprinkling of water on regular basis - Periodic maintenance and management of all the construction machinery and vehicles	Contractor
Solid waste Construction waste and domestic waste from worker camps	Minor	- Conduct separate collection of construction and domestic waste to promote recycling and re-use - Dispose non-recyclable and hazardous waste material properly according to waste management rules.	Contractor
Water Quality - Wastewater from camp site - Leakage of oil and chemical materials from construction activity	Minor	- Use of spill prevention trays and impermeable sheets to avoid contamination of the groundwater - Oil storage tank will be place for provision of safety measure regarding the contamination of soil or underground water - Septic tanks will be constructed with cemented wall to prevent the groundwater contamination.	Contractor
Noise - Noise caused by construction machinery - vehicles used for mobilization of construction equipment and workers	Minor	- Control noise through control of working hours and selection of less noisy equipment. - Proper maintenance of vehicles and construction equipment	Contractor
Operational Phase			
Air Pollution - Vehicular emissions - Exhaust gas from stacks - Gases emissions from Generator	Minor	- Proper ventilation system will be provided. - Use of low emission vehicles - Periodic maintenance of the generator and will be fitted with appropriate exhaust systems and devices	EHS officer of Project Proponent
Solid waste - Sludge from wastewater septic tank - Sewage and garbage	Minor	Testing system for Solid Waste Slag will be made in which there will be a “lined” slag pit designed to dispose of the solid waste	EHS officer of Project Proponent

Impacts	Magnitude	Recommendation Measure	Responsible Authority
from workers		• Integrated waste management will be carried out by applying, in order of preference, waste avoidance, reuse, recycling and disposal. • Solid Waste Spectrophotometer analyzer will be installed for the SW analysis. • Paper and paper carton box will be recycled • Systematic collection and protected storage of waste • Waste disposal at appropriate and designated site	
Water Quality • Rainwater drainage	Minor	• As the most of wastewater generated is of domestic in nature from staff facilities area. • Water usage at slag and crushing facility will be recycled after filling the system • Preventative Maintenance and Monitoring Program • Installation of Septic Tank so any wastewater produced complies with wastewater standards of PEQS • An emergency spill response kit will be housed on site.	EHS officer of Project Proponent
Noise • Noise and vibration from Equipments and generators	Minor	• Control noise through control of working hours and selection of less noisy equipment. • Installation of low noise/ low vibration type equipment • Proper maintenance of equipments	EHS officer of Project Proponent
Occupational Health & Safety • Occupational health and safety issues are specific to alloys manufacturing activities	Minor	• Identification of major safety and health problems arising from alloys casting activities; • Inform and train workers entering and working in the confined space of the hazards, protective measures and emergency rescue procedures	EHS officer of Project Proponent

VII. Proposed Monitoring

The monitoring program is designed to ensure that the requirements of the EPA are met. Monitoring Program (MP) provides important information that allows for more effective planning and an adaptive response based on the assessment of the effectiveness of mitigation measures. The monitoring of various parameters will help to determine the extent to which project construction/operation activities will cause environmental disturbance.

Table E-3: Project Proposed Monitoring Plan during Construction

Construction Stage	Monitoring Parameter	Monitoring Location	Monitoring Schedule	Monitoring Method	Remarks
	Emission	- Construction vehicle - Machinery - Generator			All selected locations will be checked for smoke emissions by the project management or authorized person.
	Noise	- Construction vehicle - Machinery - Generators - Welding work			Construction vehicles / machinery / generators will be checked regularly for noise level by the contractor during construction phase.
	Water	- Ground water - Surface water			Ground and surface water sample will be collected and tested.
	Solid Waste	- Worker camp - Construction site			Waste will be collected and disposed-off in environment friendly manner.
	Health & Safety	Construction site			Easily access to PPES by workers and provision of safety measures to all labor force.

Table E-4: Project Proposed Monitoring Plan during Operations

Operational Stage	Monitoring Parameter	Monitoring Location	Monitoring Schedule	Monitoring Method		Remarks
	Security	● Mill area				Security arrangement will be made.
	Emissions	● Generators				On-site monitoring from stacks of machineries and generators
	Water Quality	● Ground water ● Surface water				Collected samples of ground and surface water will be tested in laboratory.
	Noise	● Mill plant area ● Parking area				All selected locations will be checked for noise level by the project management or authorized person.
	Solid Waste	● Worker camp ● Raw material storage site				Recycling and environment friendly disposal will be endorsed.
	Waste Water	● Final discharge point				As described by SMART
	Health & Safety	● All plant area				Implementation of safety plans.
	Firefighting Arrangements	● Plant area ● Parking				Easy and timely access to fire extinguisher.
	Tree Plantation	● Green belt development				Maximum plantation will be done.

Monitoring Schedule	Regular	Monthly	Quarterly	Tri-annual	Semiannual	Annual

Monitoring Method	On-Site	Off-Site

INTRODUCTION

1 INTRODUCTION

Fast Developers was established in 1999. Our group of companies has business activities in IT & telecom consultancy, data center solutions, Operations & Maintenance, system integration and end to end solutions with past 17 years of local & global experience.

Fast Developers has transformed from a fledgling enterprise started by young professionals into a global professional services provider. Today, we have assembled a team of certified experts & specialists to provide end to end IT services & solutions according to client's unique requirements. We are committed to provide best ICT solutions and services within timeframe and budget.

FDI vision is to provide the highest level of IT professional services to important organizations, businesses and governments in its markets.

We continue to build on our past success with a steadily increase of client base. We continue growing based on our goal to exceed our client's expectations and we have proved track record for satisfied customers as evidence by an exceptional repeat of business.

In compliance with the legal requirement of Section-12 of Punjab Environment Protection Act-2012, the proponent is required to submit the Environmental Impact Assessment (EIA) report before the commencement of the proposed project, therefore, Environmental Impact Assessment (EIA) report is being submitted to the Environmental Protection Agency (EPA), Government of the Punjab, Lahore.

1.1 PURPOSE OF REPORT

Environmental Impact Assessment (EIA) report is being submitted to the Environmental Protection Agency (EPA), Government of the Punjab, Lahore, in compliance with the legal requirement for the Punjab Environmental Protection Act 2012, Section-12 for obtaining the Environmental Approval (EA) for the installation of FDI Technologies Pvt. Ltd. at Plot # 15, Phase-1A, M3 Industrial City Faisalabad. The other relevant regulations and guidelines considered while preparing this EIA report include:

1. Policy and procedures for filing, review and approval of environmental assessments.
2. Guidelines for the preparation and review of environmental reports.
3. Guidelines for public participation.
4. Guidelines for sensitive and critical areas.
5. Detailed sectoral guidelines.

Different environmental aspects like social, physical, biological and other related features of the project both during construction and its regular occupancy are highlighted in this EIA report. The necessary measures to be adopted to mitigate negative environmental impacts on any segment of the environment in and around are also described. All the important project related information is also provided as desired by the Guidelines for the Preparation of IEE/EIA reports-1997, based on which present report has been prepared. This report will also help the decision makers, EPA Punjab, in the present case, to take a judicious decision before issuing the desired Environmental Approval (EA)/No Objection Certificate (NOC).

1.2 IDENTIFICATION OF PROJECT AND PROPONENT

The proposed project is the establishment of “FDI Technologies Pvt. Ltd” for the manufacturing of IT Racks, Cable Trays, Power Cabinet and powder coating at Plot # 15, Phase 1A, M3 Industrial City, Faisalabad.

Muhammad Rizwan Chughtai

Contact #: +92-300-1757979

E-mail: Rizwan.chughtai@GROUPEFDI.com

1.3 DETAILS OF CONSULTANT

Environmental Professionals & Associates

Head Office: 231-G, Johar Town Lahore.

Email: eprofessional07@gmail.com

1.4 BRIEF DESCRIPTION OF NATURE SIZE AND LOCATION OF PROJECT

Proposed project involves the installation of FDI Technologies (Private) Limited at Plot # 15, Phase-1A, M3 Industrial City, Faisalabad with total area of 432,844 Square Feet approximately. The M/S FDI Technologies Pvt. Ltd will conduct business with best practices for the manufacturing of IT Racks, Power Cabinets, Cable Trays and Powder Coating. The production capacity of fabrication unit will be 136000 units per year while the production capacity of powder coating is 25 tons per month.

SCREENING OF THE PROJECT

2 SCREENING OF PROJECT

According to the Punjab Environmental Protection Agency (review of IEE and EIA) regulations, 2016: **Section - 4** Projects requiring an EIA

“A proponent of a project falling in any of the categories listed in Schedule II shall file an EIA with the Agency, and the provisions of Section 12 shall apply to such project.”

In accordance with the Pakistan Environmental Protection Agency Review of Initial Environmental Examination and Environmental Impact Assessment Regulations, 2000, SRO # 339 (1)/2000 the project for Aluminum and Metal alloys casting falls in Schedule –II, **Section-J:** Any other project likely to cause an adverse environmental effect” for which Environmental Impact Assessment (EIA) report is required for Environmental Approval.

Therefore, to fulfill the legal requirements of the Section-12 of the Punjab Environment Protection Act (amended 2012) the client is required to submit the EIA report in the Environmental Protection Agency, Government of the Punjab, Lahore to obtain the required Environmental Approval (EA).

SCOPING OF THE PROJECT

3 SCOPING OF PROJECT

3.1 SPATIAL AND TEMPORAL BOUNDARIES OF ENVIRONMENTAL ASSESSMENT

Spatial boundaries for project related to the environmental effects and cumulative effects for Valued Environmental Components. It depends on the Project Development Area and Local and Regional Assessment Area.

The proposed project has already existed in industry zone where all facilities are available. The Google coordinates of the project are as followings:

31° 38' 51.09"N

73° 12' 3.54"E



Figure 3-1 Location Site of Proposed Project

Temporal boundaries based on timings and duration of project activity that will happen during construction and operational phase. Construction will be done in an environmental friendly manner that will not harm any existing boundaries and surroundings of project area. Ladders, walkways, safety grills, staircases and platforms will be constructed. In addition one lockable room near the plant site will be allocating for keeping tools and tackles along with security arrangements. While during operational phase all quality test and flow measurement by processing will be done. For Air, Water and Solid waste management measures will be

adopted to achieve Punjab Environmental Quality Standards (PEQS). Safety roads, access roads / approaches will be maintained. Maximum plantation will be done.

3.2 IMPORTANT ISSUES AND CONCERNS RAISED DURING CONSULTATION

The regular survey and background studies were conducted to identify the stakeholders. People of surroundings were gathered which are likely to be affected, focus group meetings were conducted by the representatives. They were all briefed about the project whereabouts in the nontechnical and understandable way. Certain issues and suggestion about the project that is included and raised by the locals were filed and recorded.

The consultation with the government officials, welfare organizations was conducted in the formal way which includes the technical approaches to the project and the verdict of the affected or local community was also kept in view.

3.3 SIGNIFICANT IMPACTS AND FACTORS TO BE CONSIDERED

Following impacts are considered to be significant and proper mitigation and maintenance plan of these are made

- Increase risk of air pollution
- Noise propagation within the work zone
- Impacts on workers during Operations
- Incidents of equipments
- Impact on quality of water body
- Solid waste production

CONSIDERATION OF ALTERNATIVES

4 CONSIDERATION OF ALTERNATIVES

4.1 SITE ALTERNATIVEA THEIR SELECTION AND REJECTION CRITERIA

Proposed project is Installation of IT Racks, Power Cabinet. Cable Trays and Powder Coating unit by M/S FDI Technologies Pvt. Limited at Plot # 15, Phase 1A, M3 Industrial City Faisalabad. The land is already owned by the project proponent and considered suitable both in terms of environment and physical constraints. As the site is located within industry zone thus there is no restriction regarding the project activities.

No Project Option:

No project option is not a good option for the manufacturing of Power Cabinets, IT Racks. Cable Trays and Powder Coating unit which are basic necessary of every IT Industry offices and buildings to meet the market demand is highly environment friendly way as compared to put stress on natural resources.

- **A New Site or Third Party Services:**

By keeping the economical and feasible factor in mind selected site is all mean suitable because it is located within the industry zone and already owned by proponent. If new site or third party services will be taken than the cost of project will enhance and environmental impacts from emissions during the process will boost up.

4.2 DESIGN / TECHNOLOGY ALTERNATIVES, THEIR SELECTION AND REJECTION CRITERIA

4.1.1 Material Alternatives and their Selection Criteria

Aluminum and Stainless steel Cabinet

Aluminum is a lightweight material.

Stainless steel is heavier, weighing three times what aluminum does. The heavier weight of steel is an attribute to the strength of this material.

When deciding which material to use in your application, it's important to consider both strength and weight. This factor is called the strength-to-weight ratio — which you calculate by dividing force per unit by density.

Aluminum is the ideal material when you need strength and lightness for your project. For this reason, aluminum is a popular component of airplanes and bicycle manufacturing. It's also growing in use in the automotive industry — coming only second to steel.

Stainless steel is favored in car manufacturing, traditionally making up car exhaust systems, trims and grills. Stainless steel is also a common component of modern architecture and construction.

If weight isn't a major factor for your application, and strength is the main concern, steel is a better choice because of its toughness.

Corrosion

Corrosion happens when certain metals and non-metals deteriorate as a result of oxidation. Rust is a type of corrosion that affects iron and its alloys.

Stainless steel includes chromium, which serves as a protective agent against corrosion.

When stainless steel begins rusting, the chromium layer shields the other elements so that the rust can get scrubbed away. The chromium shield renews itself to continue protecting stainless steel from corrosion.

Aluminum creates a passivation layer that helps resist oxidation and rust. However, it's not invincible to other types of corrosion. When aluminum is anodized, a protective oxide layer is chemically built onto the surface of the metal, further protecting it..

Malleability

In most applications, malleability is one of the driving factors for material choice.

Aluminum is weaker than stainless steel, but when talking about aluminum's workability, this property is an advantage as it makes the metal easier to shape. Aluminum is a soft metal, which is easier to cut, stretch and manipulate without breaking.

Stainless steel is the opposite. Due to its strength and resistance to wear and abrasion, stainless steel holds its shape making it more difficult to work with than aluminum.

Electrical Conductivity

Aluminum has some of the highest electro conductivity, which makes it great at conducting electricity — unlike stainless steel.

Since the use of aluminum in electrical applications is growing, it's becoming more common to find aluminum in high- and medium-voltage overhead wiring as well as low- and medium-voltage underground cables.

Stainless steel is among the poorest electrical conductors of all metals. So if you're looking for an alternative to copper for conducting electricity, aluminum is a great choice.

Welding

Stainless steel is relatively easy to weld.

Aluminum is quite difficult to weld and requires a certain alloy for the best welding capability.

For example, the following aluminum alloys are:

- **6061 aluminum alloy:** This is well-known in the market and often gets used for machinery.
- **5052 aluminum alloy:** This alloy features the best welding characteristics of other aluminum alloys and often gets used for general sheet metal work, as well as for aircraft.

When considering stainless steel or aluminum for a project that involves welding, the best choice is stainless steel. However, if you have other factors that point to aluminum, choosing the right alloy can ease the welding process resulting in the best product.

Alternatives of Powder Coating

There are a few materials that can be wonderful alternatives to powder coating. These materials will not have all of the same characteristics as a powder coat but might fit your project's needs. Liquid paint, hydrographic printing, or an oil coating could be just what you need.

Liquid Paint

You might not realize that it can be messy and wasteful. Because there is a viscous liquid binding the colorant together, each coat must be applied very carefully and given time to dry thoroughly. If done improperly, your paint coating will have visible imperfections like runs, drips, streaks, and sagging.

When painting metals, it is imperative to pay close attention to the surface finish. Slight imperfections in the paint surface will be more prone to collecting unwanted build-up and lead to a break in your coating and corrosion of your metal part.

Oil Coating

You might be looking for a simple solution to protect your metal parts from corrosion in some cases. When looking for a simple and cheap alternative to powder coating, you should consider if a preventative oil coating could be enough to protect your parts.

Unlike a durable powder coating, an oil coating will need to be reapplied to your metal parts often. Oil coating might be an excellent option for you if reapplication will be easy and accessible.

If the metal parts are displayed, you might want a surface finish that is a little more glamorous than a simple oil coating. Many times, a long-lasting, colorful surface finish isn't the priority. If this is the case for the project, then maybe an oil coat will be just enough to get the job done.

4.3 ECONOMIC ALTERNATIVES, THEIR SELECTION AND REJECTION

For commercial purposes, aluminum and stainless steel get sold by weight.

When it comes to aluminum versus stainless steel and cost, aluminum posts a higher cost-per-pound than stainless steel. If you compare the volume of material received, though, aluminum is more cost-effective than stainless steel.

If you need a cost-effective solution for your specific application — and can use aluminum or stainless steel — aluminum is the better option because it will save you money.

Aluminum and Stainless Steel has been shown to provide major economic benefits. As a result, it is appropriate for the aluminum industry to identify, develop, and implement all technologies that will optimize the benefits of recycling. Aluminum remains the most economically attractive material from which to make aircraft and space vehicles, and new construction proceeds at a prodigious rate.

DESCRIPTION OF THE PROJECT

5 DESCRIPTION OF THE PROJECT

5.1 GENERAL

This chapter provides a simplified description of the FDI Technologies (Pvt) Ltd, involves Installation of IT Racks, Power Cabinets, Cable Trays and Powder Coating unit and its salient features, its location, its components and its various phases. Also covered in this chapter are the inputs (water, fuel, electricity, materials, etc.) and discharges (wastes, emissions, disposals, etc.) associated with construction and operation phases of the project. This proposal is a part of construction phase in project cycle.

5.2 OBJECTIVE OF PROJECT

This project is the manufacturing of IT Racks, Power Cabinets, Cable Trays and powder Coating Unit. The production capacity of fabrication unit will be 136,000 units per year while the production capacity of powder coating is 25 tons per month

5.3 LOCATION OF PROJECT

The project site is located at Plot # 15, Phase-1A, M3 Industrial City Faisalabad. The area has already been declared as “Industry Zone” by the competent authorities. The total area of the proposed project site is 432,844 Sq. ft. No population exists in close vicinity of proposed unit. The location of project site on map is shown in Figure 5-4.

Google Coordinates are:

Latitude: 31° 38'51.09"N

Longitude: 73°12'03..54"E

5.4 LAND USE

Currently the proposed land is open land and already owned by the proponent. Total area of land is approximately 432844 Sq ft.

5.5 VEGETATION FEATURES ON THE SITE

The project site and its vicinity are of barren and partial agricultural land; however, no species of significant ecological importance exist at or near the project site.

5.6 ROAD ACCESS

The project is accessible from main M3 Industrial City Road Faisalabad. All the access roads are paved and are in good conditions.

5.7 COST AND MAGNITUDE OF OPERATION

Project management intends to manufacturing of IT Racks, Power Cabinets, cable Trays and powder coating material by M/S FDI Technologies Pvt. Ltd. The production capacity of fabrication unit will be 136000 units per year while the production capacity of powder coating is 25 tons per month. Total estimated cost for the project is 550 Million Rupees. This cost will be invested on infrastructure development, Management of the environment, setup cost and material purchasing.

5.8 SCHEDULE OF IMPLEMENTATION

It is planned that the following schedule of project implementation will be adhered to. This is subject to the conditions that everything goes according to planning and no serious bottlenecks are encountered. The implementation stages of the project activity include:

1st Stage

The stage –1 comprises the onsite contouring studies and soil investigations.

2nd Stage

The stage –2 comprises the following task:

- i- Lying of foundations excavation and commencement of erection work.
- ii- Start of civil, electrical and mechanical work.
- iii- Development of basic infrastructure.
- iv- Fitting of instrumentation.

3rd Stage

The stage –3 comprises the following task:

- v- Plant/ Equipment erection completion.
- vi- Completion of the basic infrastructures water supply system, electricity supply etc.

4th Stage

The last stage will be Commencement of operation.

5.9 ENERGY

The present sanctioned power load of the project is 650KW supplied by WAPDA. In order to meet the emergency as well as critical power requirements during WAPDA shut down the project also proposes to install 250KVA Diesel Generator for standby. And in future company will also install renewable source of power generation of 100KW through Solar energy.

5.10 AVAILABILITY OF WATER

Adequate quantity of underground water is available to meet even all the project requirements. The quality of water is also satisfactory. This factor also supports the decision regarding sitting of the project at the existing site. However, the water for all project activities will be withdrawn from the underground water through bore at the project site.

The water requirements for the construction phase of the project are estimated as 600 gallons per day during the peak hours of construction. During operation phase 100 LPD water will be utilized in washrooms \.



Figure 5-1 Location Map of Project Site (Source: Google Earth)

5.11 DESCRIPTION OF PROJECT PROCESS

5.11.1 Raw Material

Steel

Steel is strong and less likely to warp, deform or bend under weight, force or heat. Nevertheless the strength of steel's tradeoff is that steel is much heavier than aluminum. Steel is typically 2.5 times denser than aluminum. It is this density that increases the hardness of steel compared to aluminum. Hardness is a material's ability to resist scratching and denting. Harder materials are simply more durable and more resistant to abrasion and denting.

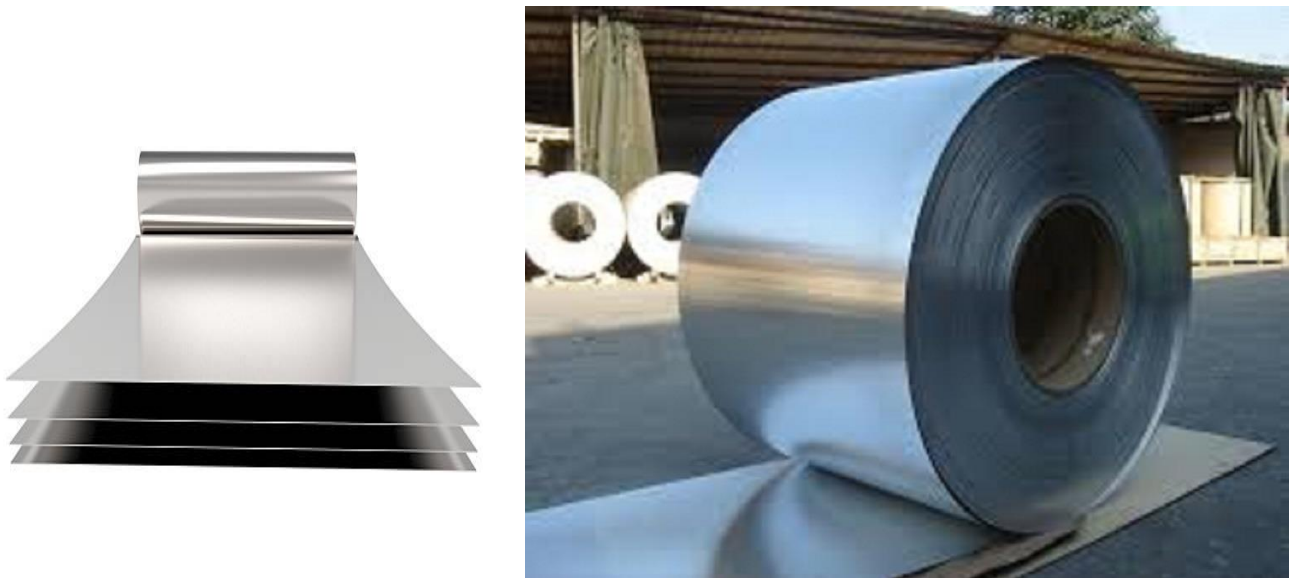


Figure 5-2 Types of Raw Material (Picture Courtesy Google Images)

Raw materials will be obtained locally or imported. With the help of the crane, metal sheets will be loaded into the storage Godown preparation equipment from where it will be transferred manufacturing area.

5.11.2 Cutting

Tube Laser Cutting

In a fiber laser, a cutting process takes place briefly as follows: The laser beams produced in the resonator are carried by fiber cable and transferred to the processing surface perfectly. The cutting process starts when the auxiliary gas used (Oxygen, Nitrogen or Dry Air) and the laser beam contact with the metal surface. With the help of axes with micron precision, the shape of the relevant part is drawn on the machining surface and the cutting process is realized. While these processes are taking place, a perfect automation and perfect cutting parameters are processed in the background.

5.11.3 Bending

Press Brake Bending

The CNC Press Brake is a sheet metal forming bench that bends the sheet metal raw material into the desired form. With this method, we can precisely bring your materials to the desired form.

5.11.4 Welding

Laser Welding

Laser welding uses a highly concentrated beam of light on a very tiny spot so that the area under the laser beam absorbs the light and becomes highly energetic. As powerful laser beams are used, the electrons in the area get excited to a point where the material melts as the result of the atoms breaking the bonds with each other.

Gas lasers, solid-state lasers, and fiber lasers are the three most common lasers used in a laser welding machine.

Normally, the laser beam is supplied to the laser welding machine by the use of optical fibers. There are single fiber welding machines and there are multiple fiber welding machines. The multiple fiber welding machines have a laser connected to each fiber, with each fiber, the strength of the laser increases.

To concentrate the beam to a point before it leaves the machine, a collimator lens in conjunction with a focusing lens is often used.

5.11.5 Coating

Powder Coating

Electrostatic powder paint, the coated metal surface is baked with a high temperature of 180-200 ° C to cure the paint and thus a painted surface that becomes a part of the metal is edified. The resulting coating shows excellent resistance to abrasion, corrosion, chemical effects and impacts.

5.11.6 Packaging & Loading

Packaging is one of the most sensitive points of our company. After manufacturing the product in the best way, it is as important as the quality of manufacturing that your product comes to you in good condition. First, we learn about our customers' demands and expectations for packaging. In this way, adding our own professionalism, the most suitable way of packing your products is achieved. We have different packaging methods for each

product type and shipment type. We do sample packaging work and pack with customer approval. Loading is as important as packaging. We load in the safest and most ergonomic way to prevent damage to the products. Our shipment layout plan is shared by our engineers in 3D.

5.11.7 Machinery in the Operational Phase

No sophisticated machinery will be used in the Operational Phase of the project. The types of machinery used for IT Racks, Power Cabinet and Cable trays manufacturing are:

- ☉ Metal Plate & Tube Laser Cutter
- ☉ Air Screw Cutter
- ☉ Laser Welding Machine
- ☉ Notching Machine
- ☉ CNC Brake Press Machine
- ☉ CNC Hole Punching Machine
- ☉ Power Press
- ☉ CNC Bending Press for Bus Bar

5.11.8 Equipment and Vehicles in Construction Phase

The following construction equipment and vehicles are expected to be present at the project site during construction phase;

- Dozer
- Excavators
- Concrete mixing plants
- Water tankers
- Water pumps
- Vehicles for personnel movement.

Exact numbers of the above equipment and vehicles varies depending upon the work schedule.

5.11.9 Construction Materials

The construction materials includes cement, sand, crush, bricks, steel bars, paints, piping materials, electrical materials and finishing materials.

5.12 RESTORATION/REHABILITATION AT THE END OF PROJECT LIFE

There will be no any matter of rehabilitation as the proposed site is already owned by the project proponent and located within industry zone. There will not be any let regarding safety factors as applicable from time to time for such unit on all accounts. However, at the end of the life of the unit, it will be duly dismantled with special precautions to avoid/minimize pollution and at the same time taking all safety precautions to protect human life and property around the project site. Debris or any other wastes resulting from demolishing will be disposed off in environmentally sustainable fashion. The materials capable of recycling/reuse will be either sold in the market or to be reused for other suitable purposes. While dismantling all Government rules and regulations as applicable to such activities will be strictly adhered to. During entire construction period, necessary precautions will be taken to ensure that no damage is done to the basic infrastructures like sewer system, power transmission lines roads, private or public property and daily human life as well. Safety measures as desired under the code of demolition will be adopted to avoid any harm to humans, property around, or the environment in the project area. Dust to be generated will be minimized by constant sprinkling of water. After completion; all construction matrix, debris and garbage will be removed off immediately from the site within the minimum possible time under safe conditions. Any minor spill over of these materials will be cleared adequately. The land, if and where pitted will be adequately leveled. On the whole, the project site and the area in its near vicinity will be made neat and clean.

5.13 GOVERNMENT APPROVALS

In a major development, the proposed project site is owned of 432844 Sq ft land at Plot # 15 Phase 1A, M3, Industrial City Faisalabad.. The environmental approval according to the Section 12 of Punjab Environmental Protection Act is the mandatory requirement of the project.

DESCRIPTION OF ENVIRONMENT

Faisalabad stands in the rolling flat plains of northeast Punjab, between longitude 73°74 east, latitude 30°31.5 North, with an elevation of 184 meters above sea level. The city proper covers an area of approximately 830 square kilometers (320 sq. mi), while the district covers.

There are no natural boundaries between Faisalabad and adjoining districts. The Chenab River flows about 30-Km (19 mi) to the north-west while the River Ravi meanders about 40 km (25 mi) south-east of the city. The lower Chenab canal is the main source of irrigation water, which meets the requirements of 80% of cultivated land. The soil of Samundary-Faisalabad comprises alluvial deposits mixed with loess having calcareous characteristics, making it very fertile. Due to its high evapo-transpiration, Faisalabad features an arid climate.

The entire land mass up to long distances is flat and sizeable area is under industrial use. Canal water and sub soil are used for irrigation and industry. The project area contains unfolded sedimentary alluvial deposits which are seismically stable within a radius of 100-km. The nearest fault is the Salt Range Thrust (SRT) fault with no significant tectonic activity

6.3.2 Soil:

Soils form major relation with environment. They influence environment by their special qualities and more so through fertility. Types of soils besides providing food, clothes or housing population serve with special food and lumber products, medicinal plants etc. Soil should not be taken as a lifeless residual layer but it is a very dynamic element of environment in which very complicated physical, chemical and biological activities are constantly proceeding. The course of the rivers within Faisalabad is winding and often subject to frequent alternations. In the rainy season, the currents are very strong. This leads to high floods in certain areas which do last for a number of days. The Rakhand and Gogera canals have encouraged the water levels in the district however the belt on the Ravi River has remained narrow. The river bed does include the river channels which have shifted the sand bars and low sandy leading to river erosion.

Faisalabad is situated at the centre of the lower Rechna Doab, the area is made up of flood plain deposits of Qmx (Stream bed and meander belt deposits) and Qfx (flood plain deposits of lower terraces).

The adjoining rural area gives higher yields of crops through the use of synthetic fertilizers and pesticides. Their irrational use is adding to pollution of soil, and water bodies.

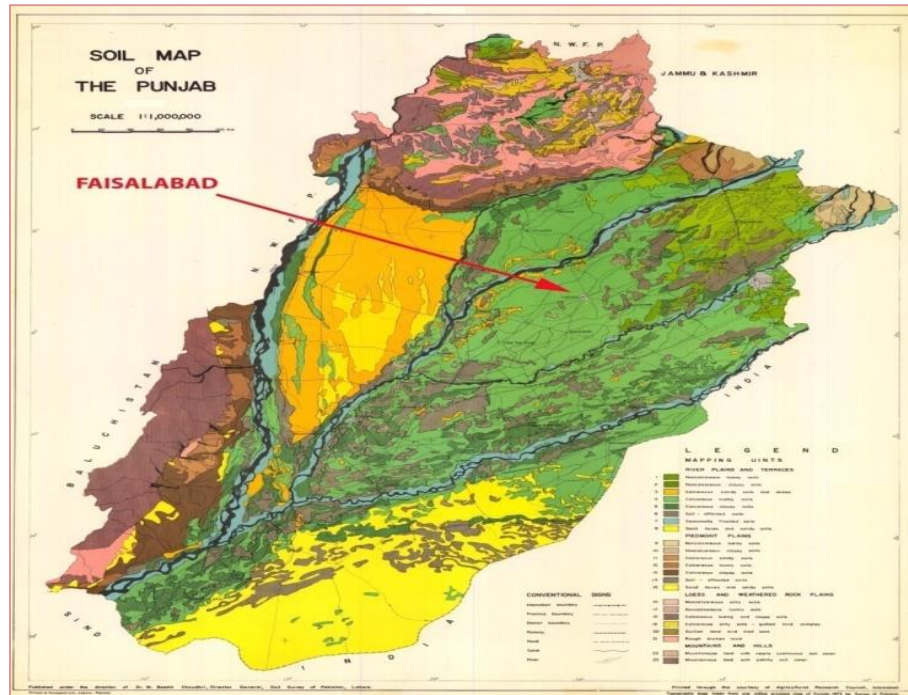


Figure 6-2: Soil Map of Punjab

6.3.3 Climate:

The weather in the city is monitored by the Pakistan Meteorological Department. The Pakistan Meteorological Department regularly provides forecasts, public warnings and rainfall information to farmers with the assistance of the National Agromet Centre. Average annual rainfall is approximately 615 millimeters (24.2 in). It is at its peak in July and August during monsoon season though western disturbances during winter months also bring considerable rainfall associated with hail. Monsoon season which starts in July and ends in September brings heavy rain to the city causing flash flooding. If the monsoon currents interact with the western disturbance, then cloudburst can also occur. July is the wettest month of the year during which flooding is reported number of times. Monsoon ends in September and then the dry period begins. October and November are the driest months with very little rainfall.

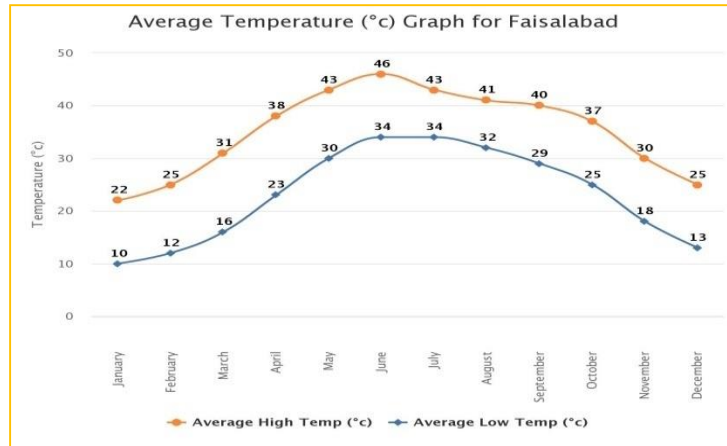


Figure 6-3: Average Temperature Graph of Faisalabad

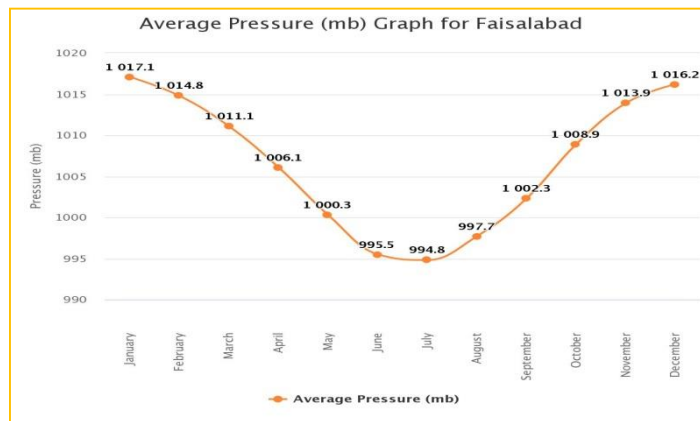


Figure 6-4: Average Pressure Graph of Faisalabad

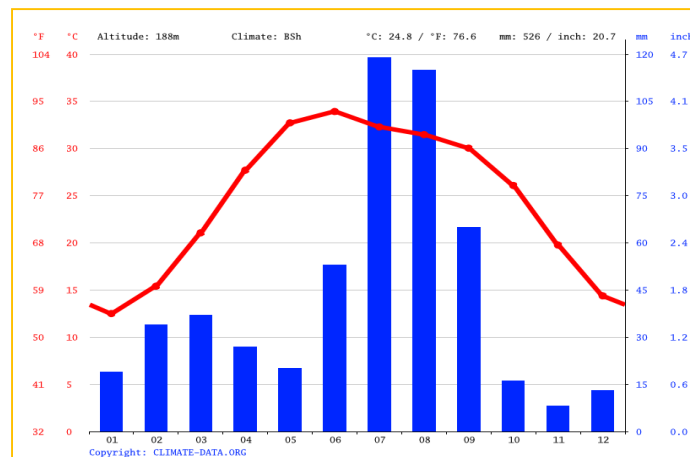


Figure 6-5: Climate Data of Faisalabad

Table 6-1: Climate Data of Project Area

Parameters	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temperature (°C)	11.9	14.9	19.9	25.9	31.1	34	32.3	31.6	30.1	25.6	18.9	13.7
Min. Temperature (°C)	4.4	7.4	12.6	18.1	23.3	27.4	27.4	26.9	24.2	17.6	10.4	5.7
Max. Temperature (°C)	19.4	22.4	27.3	33.8	38.9	40.7	37.3	36.3	36	33.6	27.5	21.8
Avg. Temperature (°F)	53.4	58.8	67.8	78.6	88.0	93.2	90.1	88.9	86.2	78.1	66.0	56.7
Min. Temperature (°F)	39.9	45.3	54.7	64.6	73.9	81.3	81.3	80.4	75.6	63.7	50.7	42.3
Max. Temperature (°F)	66.9	72.3	81.1	92.8	102.0	105.3	99.1	97.3	96.8	92.5	81.5	71.2
Precipitation / Rainfall (mm)	14	15	21	14	13	26	102	91	33	6	3	8

6.3.4 Dust Storm:

There is no prominent storm occur in project area.\

6.3.5 Seismology:

The area is not listed in the seismic potential zone.

6.3.6 Surface water:

The Chenab River flows about 30-Km (19 mi) to the north-west while the River Ravi meanders about 40 km (25 mi) south-east of the city. The lower Chenab canal is the main source of irrigation water, which meets the requirements of 80% of cultivated land. The soil of Samundary-Faisalabad comprises alluvial deposits mixed with loess having calcareous characteristics, making it very fertile. Due to its high evapo-transpiration, Faisalabad features an arid climate. The entire land mass up to long distances is flat and sizeable area is under industrial use. Canal water and sub soil are used for irrigation and industry.

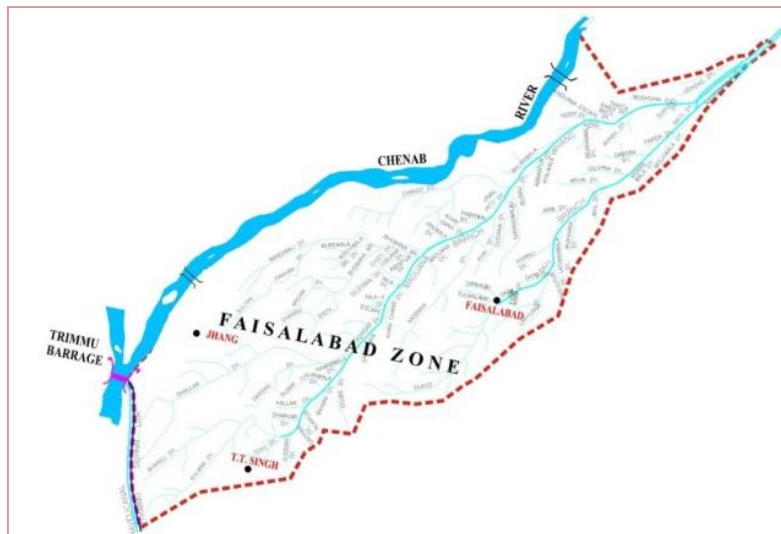


Figure 6-6: Route of Lower Chenab Canal

6.4 BASELINE ECOLOGICAL ENVIRONMENT:

6.4.1 Biodiversity:

Mainly a country's wilderness areas and scenic landscapes with their associated flora and fauna form natural capital of a country. Both collectively and within each level, the range or variety of the resources is referred to as the "Biological Diversity". The contribution of the "Natural capital" is recognized at three distinct levels including genera, species, and community -habitat and ecosystem. Pakistan comprises of a total of nine major ecological zones and the term has relevance for each of Pakistan's administrative units—district,

province, and particularly country. The greater the number of genera, species and habitats and ecosystems present within these units, the greater is the Biodiversity.

6.4.2 Wildlife:

The project is to be sited within the industrial area of Faisalabad city; therefore, there is no likelihood of any wildlife, game reserves or else around the project site. On very limited scale the following native birds like sparrows, pigeons, crows, doves, rats, lizards, snakes, etc., are found here and there, like in all Punjab.

6.4.3 Flora:

Since the project site is situated within the industrial area of the city of Faisalabad, therefore, there is no likelihood of any forest or any type of flora worth mentioning around the project.

6.4.4 Fauna:

It's a wildlife park, it hosts a number of animals, such as: Deer, Mouflon (wild sheep), Black Bucks (antelope), Monkeys, Rabbits., Crocodiles., Cranes. Partridge

6.4.5 Major Crops:

Sugarcane, Wheat, Cotton, Maize, Moong and Rice (cleaned) are the main crops grown in the district. Besides, Tobacco, Bajra, Jawar, Mash, Masoor, Gram, Oil Seed such as Sunflower and Rape / Mustard Seed is also grown in minor quantities in the Faisalabad district.

6.4.6 Major Fruits:

Guava, Citrus and Mango are the main fruits grown in the district. Besides, Banana, Phalsa, Pears and Peach are also grown in minor quantity in the Faisalabad district.

6.4.7 Main Vegetable:

Potato, Cauliflower, Onion, Lady Finger and Tomato are the main vegetables grown in the district. Besides, Bottle Gourd, Carrot, Turnip, Brinjal, Garlic, Chillies, Radish, Bitter Gourd and Peas are also grown in the Faisalabad district in minor quantities.

6.4.8 Fishery and Aquatic Biology:

The nearest natural drain has no fish. There is no fish farming in the area either naturally or commercially.

6.5 BASELINE SOCIOECONOMIC ENVIRONMENT:

6.5.1 Administrative Boundaries:

Faisalabad was restructured into city district status; a devolution promulgated by the 2001 local government ordinance (LGO). It is governed by the district's seven departments:

leather products and light engineering goods play an important role, with more than 48,000 industrial units spread across Punjab. In an effort to boost bilateral trade, Romania and Turkey have honorary-consulates in Faisalabad which enable trade links with the city.

FIEDMC was established by Federal Government to boost manufacturing in Faisalabad. Main features are suitable land, affordable cost, state-of-art infrastructure, provision of utilities at the doorstep of each industry and full set of dedicated business support services. It has three main projects of national importance

- Value Addition City (VAC)
- M-3 Industrial City (M-3-IC)
- Allama Iqbal City (AIIIC)

The M-3 Industrial City comprises of 4356 acres of land while the ALLC comprises of more than 3300 acres of land accommodating Textile, Pharmaceuticals, Information Technology, Chemicals Automotive, service complex, etc.

6.5.3 Demography:

Faisalabad was established as one of the first planned towns of British India, covering an area of 3 square kilometers (1.2sqmi). It was initially designed to accommodate 20,000 people. The city's population increased from 69,930 in 1941 to 179,000 in 1951 (152.2% increase). Much of the increase is attributed to the settlement of Muslim refugees from East Punjab and Haryana, India. In 1961, the population rose to 425,248, an increase of 137.4%. Faisalabad set a record in the demographic history of Pakistan by registering an overall population increase of 508.1% between 1941 and 1961. The industrial revolution of the 1960s contributed to population growth. In 1961, the population was 425,248. A 1972 census ranked Faisalabad as the 3rd largest city of Pakistan with a population of 864,000. In a 1981 census, the population was 1,092,000; however, the Faisalabad Development Authority estimated the number to be 1,232,000. In the 2017 consensus, the total population of the city was 3,203,846

6.5.4 Culture:

Faisalabad, the third most populated metropolis in Pakistan after Karachi and Lahore is an epicenter for trade that has gained popularity for its colonial heritage sites. In 1982, the Government of Punjab established the Faisalabad Arts Council, a division of the Punjab Arts Council which is overseen administratively by the Information, Culture and Youth Affairs Department. The Faisalabad Arts Council building, designed by architect Nayyer Ali Dada,

was completed in 2006. The auditorium was named after the late Nusrat Fateh Ali Khan, a Pakistani musician and singer.

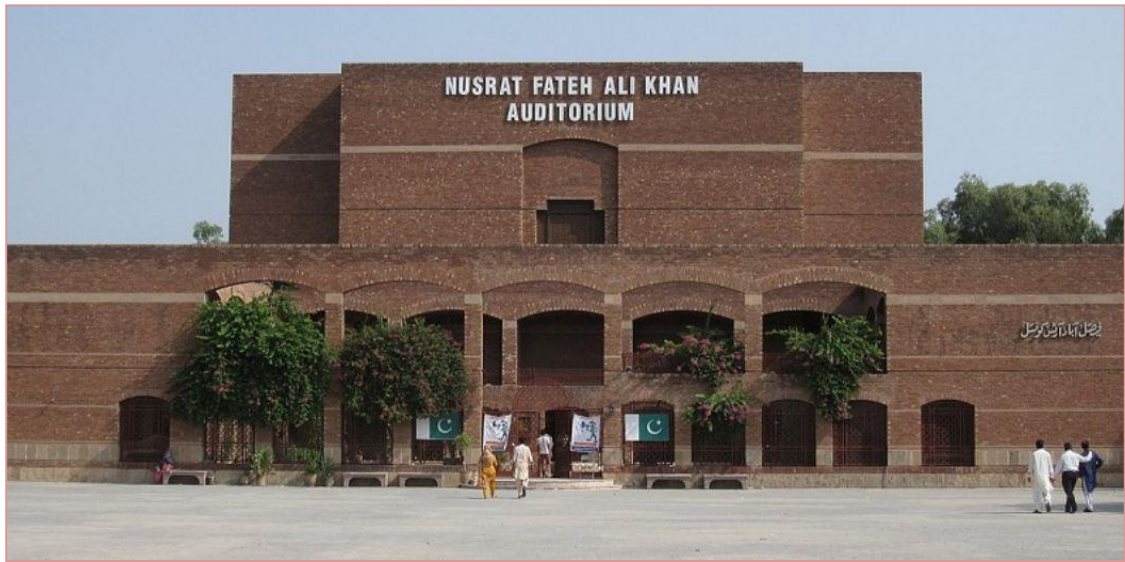


Figure 6-8 Faisalabad Art Council

6.5.5 Festivals:

The city of Faisalabad customarily celebrates its independence day on 14 August every year by raising the Pakistan flag at the clock tower in the Commissioner Office compound. Bazaars are colorfully decorated for the celebration, government and private buildings are brightly lit, and there are similar flag-raising ceremonies that are typically held in the district and its Tehsil. The arrival of spring brings the annual "Rang-e-Bahar" festival where the Parks & Horticulture Authority of the city district government organize a flower show and exhibition at Jinnah Gardens. The University of Agriculture organizes a similar event at their main campus which is known as the "Kissan Mela". The festival of Basant which involves kite flying is an annual tradition in the city despite the ban. The provincial government introduced the "Canal Mela" which involves five days of festivities including the main canal in the city being decorated with national floats and lights ending with a musical concert to conclude the festival.

6.5.6 Literacy:

According to a report by the United Nations Educational, Scientific and Cultural Organization (UNESCO), the 2015 literacy rate for Pakistan ranked 160th which is among the lowest literacy rates in the world. In 1981, Faisalabad was among four districts in Punjab, which included Gujranwala, Jhelum and Gujarat that were experiencing low literacy rates, due primarily to either a lack of resources or family pressure; the latter of which may also be attributable to illiteracy. In 1998, Faisalabad progressed to a higher literacy rate with the most

improvement realized at the primary school level. In 2008, Faisalabad District ranked 51.9% which placed the district 9th in literacy out of the 34 Punjab districts.

6.6 QUALITY OF LIFE:

6.6.1 Industries

Before independence, there were only five industrial units in Faisalabad City (then Lyallpur). Now, there are dozens of textile mills with other subsidiary units. Roughly, there are 512 large Industrial units, out of which 328 are Textile units, 92 engineering units and 92 of chemicals and food processing units. . Faisalabad is recognized as the centre of the textile industry in Pakistan, contributing to half of Pakistan's total textile shipments. At the end of June 2012, textile mills employed 20% of the nation's workforce, and generated 1.3 trillion rupees (\$13.8 billion) in textile products, most of which were exported to the US and Europe. Famous industries are Sitara Textile Private Limited, Sapphire finishing mills and Hyundai Nishat motor (Private).

6.6.2 Roads:

Faisalabad is connected to various parts of the country by several National Highways and Motorways:

- The Grand Trunk Road, otherwise known as GT Road, is the original highway that links Faisalabad to most parts of Pakistan as well as neighboring countries. GT Road was the main highway that ran through the district before the completion of the motorways.
- The M-3 motorway (Pakistan) or M3 is an access-controlled motorway connecting Faisalabad with the M-2 motorway (Pakistan) or M2 via the Pindi Bhattian Interchange. The M2 was the first motorway connecting Rawalpindi and Islamabad to Lahore.
- The M-4 motorway (Pakistan) or M4 is an access-controlled motorway connecting Faisalabad to Multan. The M4 further joined the M5 which connects to the southern city of Sukkur.

6.6.3 Buses:

The Faisalabad Urban Transport System Service (FUTS) the main bus operator within the city. It was launched in 1994, and operates a number of large CNG buses and smaller Toyota hiace vans connecting the majority of the city. There is another public-private run bus operator, Brothers Metro, which is a consortium between the government of Punjab and a

private firm who operates a fleet of air-conditioned CNG buses. Now the Metro Brothers (MB), the project of buses are also launched in the city by the Punjab government.

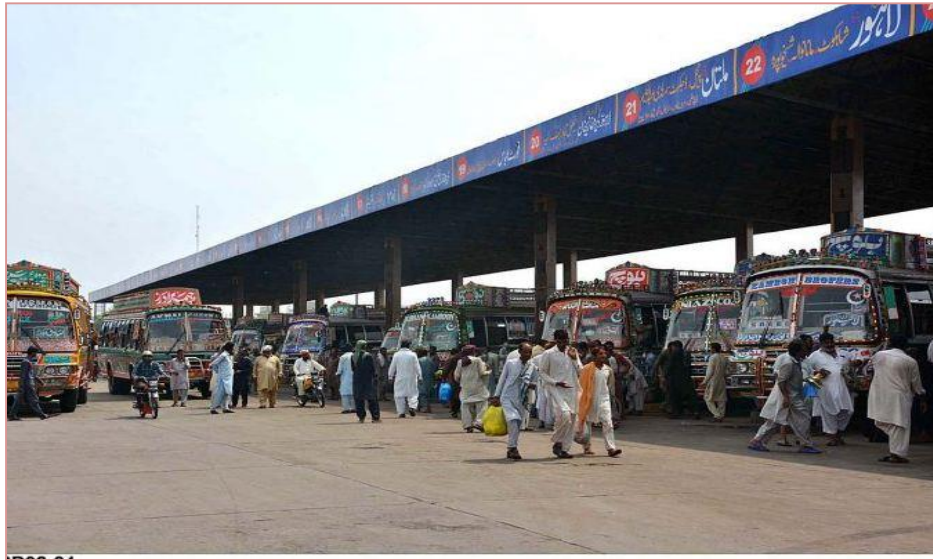


Figure 6-9 Faisalabad Lari Ada

6.6.4 Rail:

The Faisalabad railway station is the central railway station in the city. The railway line forms part of the Khanewal–Wazirabad railway line. Rail services are operated by Pakistan Railways, owned and operated by the Ministry of Railways. Cargo Express services are operated by Pakistan Railways which runs from Karachi to Faisalabad via Multan. Twenty-seven bogies comprise the goods train, and are handled respectively by private contractors at the station. The station has a special cargo facility operated by the Ministry of Railways (Pakistan) for handling various goods from the city to other regions of the country. An express parcel service runs from Karachi to Lahore via Faisalabad.



Figure 6-10 Faisalabad Railway Station

6.6.5 Air Traffic:

Faisalabad International Airport is approximately 15 kilometers (9.3 mi) from the city centre and is a major airport for domestic and international travel. The airport includes a cargo facility. As of January 2016, passenger flights are run by the national flag carrier, Pakistan International Airlines, and a number of Middle Eastern carriers. Fly Dubai became the first international carrier to launch operations from the city followed by Qatar Airways, Air Arabia and Gulf Air. In 2015, significant upgrades and renovations to the airport were initiated by the Pakistan Civil Aviation Authority, including updates to aviation technology, construction of additional areas and services for travelers, and the expansion of air traffic capabilities to accommodate wide-body aircraft such as the Boeing 777.



Figure 6-11 Faisalabad International Airport

6.6.6 Education System:

The education system is monitored by the Chief Executive Officer (CEO) of the District Education Authority of Faisalabad. The city government reports its findings to the Ministry of Federal Education and Professional Training and the Minister for Education. Funding is provided by the government of Pakistan, City District Government and the fees collected from schools. There are four levels of the education system in the city: Primary, Elementary, High and Higher Secondary Level. Primary level education is only compulsory. There are a

number of schools for the assistance of children with special needs. Faisalabad has several research and educational institutions, both public and private, such as the University of Agriculture, Government College University, National Textile University, Nuclear Institute for Agriculture and Biology, University of Faisalabad, Government College for Women University and The University of Engineering & Technology of Lahore. In 2014, the University of Agriculture ranked 1st in agriculture and 4th overall for universities in Pakistan according to the Higher Education Commission of Pakistan (HEC), and was ranked 142nd in the 2013 Top 200 World Universities for agriculture and forestry by QS ranking.



Figure 6-12 University of Faisalabad

6.6.7 Public Libraries and Museums:

There are two libraries that are open to the public: Allama Iqbal Library and Municipal Corporation Public Library. They are funded and regulated by the government of Punjab under the service sector. Allama Iqbal Library is located on University Road, opposite the District Courts. The library is housed in the 1911-built colonial building originally named "Coronation Library" during the rule of the British Empire. Museum is located adjacent to the Allama Iqbal Library on University Road. It is a heritage museum and art gallery is open to the public. The museum is primarily focused on regional history with a collection of artwork and photographs. Municipal Library is located in Iqbal Park on Narwala Road, opposite the historical grounds of Dhobi Ghat. The library has a large collection of books, a photo gallery and a conference centre. In 2011, the library underwent a renovation costing 40 million rupees.



Figure 6-13 Allama Iqbal Library

IMPACTS ASSESSMENT

7 IMPACT ASSESSMENT

7.1 PROBLEMS AND ITS OCCURENCE

On the basis of the findings of the EIA, it is concluded that the project will not pose any adverse impact on the local population and the environment. A proper management plan shall be prepared in case of any accident like;

- Any health hazard to workers/other persons during construction or operation phase.

As mention above that the project will not pose any adverse impacts to the environment. An assessment of impact during construction and operation phase is given in table 7.1, which indicates the impact and their magnitude

7.2 WAYS OF ACHIEVING MITIGATION MEASURES

7.2.1 Changing in Planning and Design

No such change is required in the planning and design of the project as it does not have any significant impact.

7.2.2 Improved Monitoring and Management Practices

There shall be a suitable program of monitoring and maintenance. There will be proper firefighting and health and safety plan. Any improvement in monitoring and management practices shall be addressed to concerned authorities.

7.2.3 Compensation in Money Terms

There is no compensation in money terms as the land is already owned by the Project Proponent. Land documents are submitted for the same.

7.2.4 Replacement, Relocation and Rehabilitation

There will be no any matter of replacement, relocation and rehabilitation as the proposed site is already owned by the project proponent and located within the industry zone. There will not be any let regarding safety factors as applicable from time to time for such buildings on all accounts.

Table 7—1 Anticipated Impacts and their magnitude of the Project

Environmental Components Components/ Activities	Physical Environment													Biological Environment									Social Environment					
	Agricultural Lands	Soil (Erosion/Stability)	Aluminum Recycling	Cultural/Religious Properties	Infrastructure	Mineral Resources	Downstream River Flows	Flooding	Surface water quality	Groundwater quality	Air quality	Noise		Aquatic Ecosystem	Wetland Ecosystem	Terrestrial Ecosystem	Endangered Species	Natural Flora	Wildlife	Disease Vectors	Public Health/Safety		Land Use	Communication System	Employment	Community Stability	Cultural and Religious Value	
Construction Phase																												
Construction Camp site	N A	L A	O	O	O	O	N A	N A	O	LA	LA	L A		O	O	O	O	O	O	L A		O	L A	O	LB	O	O	
Digging and excavation activities	N A	L A	O	O	O	O	N A	N A	O	O	LA	L A		O	O	O	O	O	O	O		O	O	O	LB	O	O	
E&M of Equipments	N A	L A	O	O	O	O	N A	N A	O	O	LA	L A		O	O	O	O	O	O	O		LA	O	O	M B	O	O	
Vehicular Movement	N A	L A	O	O	O	O	N A	N A	O	LA	LA	M A		O	O	O	O	O	O	O		LA	L A	O	O	LA	O	

Environmental Components Components/ Activities	Physical Environment												Biological Environment							Social Environment					
	Agricultural Lands	Soil (Erosion/Stability)	Aluminum Recycling	Cultural/Religious Properties	Infrastructure	Mineral Resources	Downstream River Flows	Flooding	Surface water quality	Groundwater quality	Air quality	Noise	Aquatic Ecosystem	Wetland Ecosystem	Terrestrial Ecosystem	Endangered Species	Natural Flora	Wildlife	Disease Vectors	Public Health/Safety	Land Use	Communication System	Employment	Community Stability	Cultural and Religious Value
Machinery and Equipments work	N A	L A	O	O	O	N A	N A	N A	O	O	LA	M A	O	O	O	O	O	O	O	LA	L A	O	LB LA		O
Operation Phase																									
Solid Waste	N A	L A	O	O	O	N A	N A	N A	O	LA	O	O	O	O	O	O	O	O	O	LA	O	O	O	O	O
Fire Fighting Arrangement	N A	O	O	O	O	N A	N A	N A	O	O	O	O	O	O	O	O	O	O	O	HB	O	L B	LB	M B	O
Health and safety	N A	O	O	O	O	N A	N A	N A	O	O	O	O	O	O	O	O	O	O	O	HB	O	L B	LB	M B	O
Waste water	N A	L A	O	O	O	N A	N A	N A	O	LA	O	O	O	O	O	O	O	O	O	LA	O	O	O	O	O

LA: Low Adverse

MA: Medium Adverse

HA: High Adverse

NA: Not Applicable

O: None or Insignificant

LB: Low Beneficial

MB: Medium Beneficial

HB: High Beneficial

ND:

Not

Determinable

7.3 CHARACTERISTICS OF IMPACTS

Figure 7-1 Impact Characterization

Impact	Nature	Duration	Geo-Extent	Reversibility	Likelihood	Consequence Severity/Utility
Physical Impact						
Air Quality	D	ST	LO	RE	LK	MN
Ground Water	ID	LT	LO	IR	PO	MO
Water consumption and water availability	D	ST	LA	RE	PO	MN
Biological Impacts						
Natural Vegetation	D	LT	LO	RE	PO	MO
Wildlife	D	LT	LO	IR	PO	MO
Social and Socio economic Impacts						
Traffic Congestion	D/ID	ST	LO	RE	PO	MN
Noise and Vibration	D	LT	LO	RE	CE	MO
Safety Hazards	D	ST/LT	LO	RE/IR	CE	MU
Employment	D	LT	LO/LA	RE/IR	CE	MU
Infrastructure	D/ID	LT	LO/LA	RE/IR	CE	MO
Public Health and Nuisance	D	ST/LT	LO	RE/IR	LK	MN

D: Direct	ID: Indirect
CE: Certain	LK: Likely
LT: Long Term	ST: Short Term
PO: Possibly	MN: Minor
MJ: Major	MT: Medium Term
MO: Moderate	LO: Local
LA: Large	SV: Severe
RE: Reversible	IR: Irreversible

SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

8 SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

8.1 ENVIRONMENTAL PROBLEMS DUE TO INSTALLATION AT PRESENT LOCATION OF PROJECT

Environmental problems related to location of the project are mostly in the areas of physical setting, socioeconomic setting, ecological setting and special areas. Field survey revealed that the impacts of the project due to its location are mostly insignificant in nature.

8.2 PROJECT DESIGN RELATED ENVIRONMENTAL PROBLEMS

The design unit has sought to minimize any environmental potential impacts by ensuring that the project should be in according to the environmental standards. Local aesthetic value is another issue to be considered during project design.

8.3 ENVIRONMENTAL PROBLEMS ASSOCIATED WITH CONSTRUCTION

The construction will also sometimes go round the clock, therefore, during all construction activities the followings will be the major pollutants/wastes or project related pollution aspects:

- Soil erosion
- Particulate matter/dust and gaseous emissions from construction machinery and vehicles transporting materials.
- Noise from construction machinery and vehicles transporting materials
- Garbage as construction waste including clay, sand, crush stones, paper, plastic, wood pieces, aluminum and other metals as scarp, wires, rags, ropes etc
- Dust during raw materials unloading and its use in construction
- Sewage and solid wastes from construction camp
- Some social impacts due to accumulation of workers may arise
- Some problems to utilities infrastructure of the area may occur especially due to labor negligence

A number of machinery and equipment is in operation for the construction of building, which includes:

- Batching plants
- Excavators

- Truck
- Transport vehicles
- Concrete mixers
- Vibrators
- Welding plants
- Generators etc.

Most of these are using diesel engines that generate noise and exhaust emissions. The possibility of exhaust emissions increases when old vehicles/plants are utilized for the execution purposes. Generally, the above activity is generating particulate- matter (PM₁₀), smoke, dust, CO and NO_x in the ambient air, which is deteriorating the air quality and resulting in adverse impacts on human health, fauna and flora. The movement of heavy machinery and vehicles on the dirt tracks is also causing fugitive dust emissions.

Due to the movement of vehicles, noise and vibration will be increased and residents of the nearby settlements will be affected.

Source of air pollution for this project activities are unpaved roads. Dust plumes behind vehicles moving along unpaved roads represent a typical occurrence, since as the vehicle travels over an unpaved road, the force of the wheels on the road surface causes pulverization of the surface material. Particles are lifted and dropped from the rolling wheels, and the road surface is exposed to strong air currents in turbulent shear with the surface. The turbulent wake (behind the vehicle) continues to act on the road surface after the vehicle has passed. As an approximation, fugitive dust (dust generated from unpaved roads is termed “fugitive dust” because it is not discharged into the atmosphere in a confined-flow stream) from unpaved roads can be considered to average about 75 lb per vehicle-mile of travel. This dust would be a problem for the surrounding communities.

8.4 MITIGATION MEASURES OF IMPACTS ON AIR AND NOISE

- Tuning of vehicles should be made mandatory to reduce the emissions of NO_x, SO_x, CO and PM₁₀.
- Emissions from the batching plants should be controlled with appropriate control equipment (such as fabric filters or cyclone separators).
- Equipment and vehicles powered with diesel should be well maintained to minimize particulate emissions.

- Trucks carrying, sand, and aggregate and other materials should be kept covered during transportation of materials and during storage at site, with tarpaulin.
- For the construction machinery generating noise level in excess of that prescribed in PEQS, Contractor will make arrangements to bring the noise level within applicable limits (including proper tuning of vehicles and mufflers/silencers).
- Movements of the trucks and other construction machinery causing high noise levels must be restricted at night time to avoid disturbance to the nearby locality. Truck drivers should be instructed not to play loud music at night and stop use of horn.
- It is suggested that noise barriers should be installed at construction site during the construction phase of the project.
- The fugitive dust emission will be a problem for the nearby communities which will be mitigated by sprinkling of water.

8.5 ENVIRONMENTAL PROBLEMS DURING PROJECT OPERATION

Environmental problems relating to gaseous emissions, PM and noise (from stand by generator) during operation of the unit on regular basis will be of minor significance as they will be operate during the power shut down only stack emissions produced in response of metals recycling process will be mitigate by flue to air heat exchanger, baghouse dust collector and ID fans.after proper treatment and to meet the limit of PEQS stack will be relese in air.

8.5.1 Duct & Bends

Ducts and Bends are required to convey flue gases from point of suction to final top of the chimney and connect various equipments. All bends and reducers are aerodynamically designed and have provision for manhole cleaning mechanism.

8.5.2 Stack (Chimney)

The generated gases are passed to atmosphere after treatment through stack of height 80 feet. The solid waste in the form of waste scrap, iron etc, will be produced in that immediately will be sold to local vendors after solid waste spectrophotometer analyzer.

8.5.3 Air Emissions

All the release into the environment will be made after passing it through the cyclone, flue to air heat exchanger, bag house dust collector (dry type) and ID fans for removal of dust particles and release of flue gas into the environment. Completely automated and state of the

art. Dust will be collected automatically in Flue Storage Silos through automated conveying system. Flue will be recycled.

8.6 POTENTIAL ENVIRONMENTAL ENHANCEMENT MEASURES

As described above the worth mentioning wastes will be sewage and solid waste in the plant in the form of waste iron/metls etc of the project. In order to enhance environment the following equipments will be installed:

8.6.1 Air Pollution Control System

Working Principle

- Air Blower (Induced Draft Fan) creates negative system pressure
- Fume Hood collects polluted gas
- Collected gas is forced into Gravity Chamber #1 where most of heavy dust particles are collected
- Cyclone creates air vortex to collect medium dust particles
- Clean, pollution free gas is discharged into the atmosphere by Air Stack

8.6.2 Water Management

- Rain water disposal will be done through adequate system to be provided at all levels of the building.
- Sewage will be discharged to the main sewerage system; after its treatment as recommended in this EIA report; and also getting the permission from the competent authority.
- A tentative summary flow sheet (sketch) of the effluent treatment process is

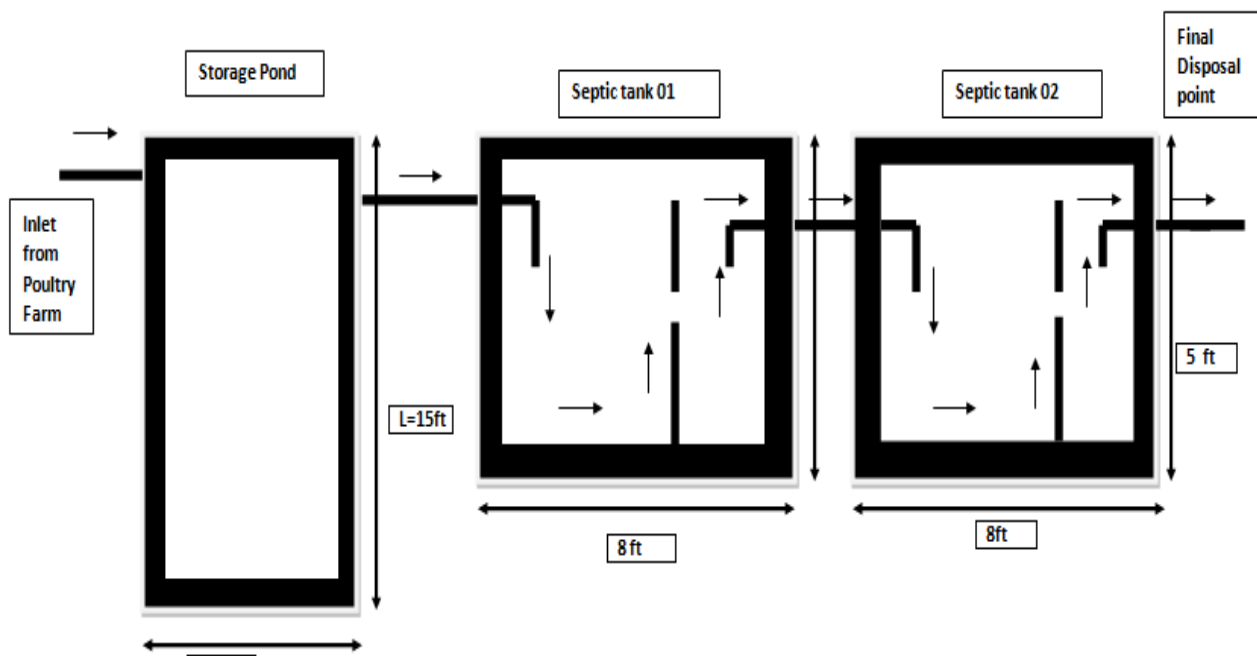


Figure 8-1 Septic Tank

following.

Electricity made available by 450kW from WAPDA, 250kVA Diesel Generator for Standby and 100kW Solar (in future) installation will be done.

- Adequate fire fighting system will be maintained at all times and the required quantity of water will always be kept in storage.
- Visual impact of the building and its surroundings has also been taken into consideration.
- The land use will be done in an away that it will not create any threat to the privacy of the adjoining buildings.
- Electricity will be used from WAPDA; however, available stand by generator will also be used whenever there is casual power shut down. In the first place the generator is to be housed in double built containment/ housing, therefore, its noise will be curtailed well within the limits of the Punjab Environmental Quality Standards (PEQS). Secondly, due to short durations of its running will produce gaseous emissions or PM in negligible amount.

In order to assess the existing environmental status of the project area, on site environmental monitoring for the ambient air quality regarding gaseous emissions including Sulphur Dioxide (SO₂), Nitrogen Oxides (NO_x) and Carbon Monoxide (CO), Particulate Matter and noise pollution was carried out. So also quality of the civil water supply was determined through laboratory testing of the water sample collected from underground water supply system.

8.7 IMPACTS ON SOCIO-ECONOMIC ENVIRONMENT

The project has no negative socio-economic impacts rather it has positive impacts on the local community.

**ENVIRONMENTAL MANAGEMENT
AND MONITORING PROGRAM**

9 ENVIRONMENTAL MANAGEMENT AND MONITORING PROGRAM

9.1 ENVIRONMENTAL MANAGEMENT PLAN (EMP)

The EMP will facilitate proponents the proponents to address the adverse environmental impacts of the project, enhance project benefits and introduce standards of good environmental practices.

9.1.1 Objectives of EMP

The EMP aims to ensure that:

- Site activities are well managed
- All environmental safeguards are carried out correctly
- Coordination is made with other trades
- Adverse impacts on environment are minimized
- The biodiversity of the site is conserved or enhanced
- All relevant legislation is complied with prescribed procedures/standards
- The project is monitored for environmental impacts

9.1.2 Structure of EMP

The structure of the EMP will:

- Describe that how it fits into the overall planning process for the project
- Detail the activities that are to be carried out
- Identify the impacts of activities may have on environment
- Propose environmental control methods to be used to prevent or minimize those environmental impacts
- Assign responsibility for each control measure to specific staff members
- Identify key monitoring parameters and schedule of monitoring of these parameters
- Identify training requirements at various stages of the development of the project
- Identify the resources required to implement the EMP and outline relevant expenses arrangements

9.2 PROJECT IMPLEMENTATION INSTITUTIONAL REQUIREMENTS

The following organizations would be involved in the implementation of the proposed EMP;

- **M/S FDI Technologies (Pvt.) Ltd** as the proponents of the project and owners of the EMP during construction and operation of the project.
- Project Contractor, as the executor of the EMP during construction stage of the project.
- Supervisory Consultant, as monitor of the execution of the EMP during construction stage.
- Environmental Protection Agency (EPA), Punjab, as Government Department to review and monitor the implementation of remedial and mitigation measures as given in EIA.

9.3 ENVIRONMENTAL MANAGEMENT TEAM ALONG WITH THEIR ROLES AND RESPONSIBILITIES

In light of unit shall consist of the following members from the industry.

List of members that shall part of environmental management team as mentioned in **table below**:

Table 9—1 Members of Environmental Management Team

Sr. #	Env. Management Team	Roles	Responsibilities
a)	Project Manager	Supervisor.	– To plan, disseminate, implement and continuously develop the environmental management system according to the policy. – To monitor and assess the implementation of the committees' environmental management system.
b)	Heads of all departments	Member	– To support the implementation of the environmental manager representative (EMR) and environmental management system committees – To set up the environmental policy for company assignment in written.
c)	Health and Safety Officer	Member	The role typically involves preparing health and safety strategies and developing policies; carrying out risk assessments; liaising with

Sr. #	Env. Management Team	Roles	Responsibilities
			regulatory authorities to ensure compliance with mandatory regulations; investigating accidents on sites and producing subsequent reports and recommendations; and carrying out site inspections to check policies and procedures are being properly implemented.
d)	Process Control Engineer	Member	Optimize processes and implement quality control systems in the industry. They design, test, and oversee the implementation of new processes. They are often employed at manufacturing/processing plants that process chemicals, metals, and other materials.
e)	Head of the Audit department	Member	Developing testing methodologies to evaluate the adequacy of controls. Documenting the results of the evaluations. Developing recommendations and reports based on audits and presenting these ideas to senior management.
f)	Other Industry members as the Superintendent may designate.	Member	Oversee day-to-day field activities. Supervise the activities of subcontractors and subordinate staff.

In FDI Technologies Pvt. Ltd where the posts describe above do not exist; the Project manager shall designate another staff member to perform the duties and responsibilities of the holder of such posts.

9.4 PROPOSED EMP REPORTING AND REVIEWING PROCEDURES

This section will specify institutional responsibilities for contractors, Borrower, local authorities, and EPA, with the roles that prepare, submit, receive, review, and approve the reports. An implementation schedule detailing the timing, frequency and duration of

mitigation measures, monitoring, and reporting of the progress will be prepared, showing phasing and coordination with procedures in the project operations manual and loan agreement. Recipients of such reports will include those with responsibility for ensuring timely implementation of mitigation measures and for undertaking remedial actions. In addition, the structure, content and timing of reporting will be specified to facilitate supervision, review and approval (if necessary) by EPA.

The implementation of the EMP will be the prime responsibility of the project proponents who designate responsibilities and obligations to their selected contractors and staff. Monitoring, documentation and reporting the compliance components of the EMP will be the responsibility of proponent.

9.4.1 Reporting

The relevant reporting structure will be included in site environmental training and induction and will be clearly displayed, along with contact names and numbers. In the event of an incident that causes, or is likely to cause, environmental harm, as defined in the EP Act, immediate action will be taken to minimize the effects of the incident. As soon as is reasonably practicable, the details of the incident and corrective actions taken will be reported to Process Plant Operator.

9.4.2 Review and Update

The EMP is intended to be dynamic and will be reviewed as often as necessary in accordance with changes to:

- Selected technologies or equipment
- Operational activities
- The legislative environment and/or approval conditions
- Improvements in best practice environmental management
- Corrective actions implemented as a result of complaints, incidents or non-conformance situations
- Audit Report recommendations.

9.5 ANY TRAINING NEED TO REQUIRE TO ENSURE IMPLEMENTATION OF EMP AND MONITORING PLANS

All staff and contractors will receive induction training about the general requirements of the EP Act and their specific duties and responsibilities associated with the operation of the

project activities and with the EMP. At a minimum, the environmental component of the induction will address the following:

- ‘General environmental duty’ and ‘duty to notify environmental harm’
- Specific environmental risks identified for the Project
- Requirements of the EMP
- Emergency contact information. In addition, relevant environmental issues will be reinforced at regular opportunities

9.6 ENVIRONMENTAL MANAGEMENT PLAN FOR CONSTRUCTION AND OPERATION PHASE

Environmental Management Plan (EMP) given in Table-9.2 will be implemented for the better management of environmental issues which can be arises by the project activity.

Table 9—2 Environmental Management Plan of FDI Technologies (Pvt) Ltd (During Construction Phase)

Sr. No	Project Component or Impact	Target	Mitigation	Responsibility
Constructional Stage				
1.	Topography	To minimize negative impact to topography of the Project Area.	- As the site for the project activity is already available therefore there will be no change on the topography of the project area. - Tree plantation will be carried out on large scale to enhance to topographic beauty of the area.	 M/S FDI Technologies Pvt. Ltd. Project Manager  Contractor
2.	Soil	To minimize soil erosion and contamination.	- Low embankments will be protected by planting Vetiver grass that can flourish in relatively dry conditions; - Soil contamination by asphalt will be minimized by placing all containers in caissons; - All spoils will be disposed off as desired and the site will be restored back to its original conditions before handing over; - Soil erosion checking measures such as the formation of sediment basins, slope drains, etc, will be carried out.	 M/S FDI Technologies Pvt. Ltd. Project Manager  Contractor
3.	Health and safety of workers and associated communities	To minimize health risks	- Provide training on basic First Aid to specified work staff in order to help the injured workers onsite. - Work safety measures and good workmanship practices are to be followed by the contractor to ensure no health risks for laborers; - Personal Protective Equipment (PPEs) will be provided to the workers operating in the vicinity of high risk area;	 M/S FDI Technologies Pvt. Ltd. Project Manager  Contractor

Sr. No	Project Component or Impact	Target	Mitigation	Responsibility
Constructional Stage				
			▪ Provision of adequate sanitation, washing, cooking and dormitory facilities including light up to satisfaction; ▪ Ensure strict use of wearing these protective clothing during work activities; ▪ Elaboration of a contingency planning in case of major accidents; ▪ Adequate signage, lightning devices, barriers and persons with flags during construction to manage traffic at construction sites, haulage and access roads.	
4.	Air Quality	To minimize air pollution	▪ All vehicles, machinery, equipment and generators used during construction activities will be kept in good working condition and be properly tuned and maintained in order to minimize the exhaust emissions; ▪ Open burning of solid waste from the Contractor's workforce will be strictly banned; ▪ Preventive measures against dust will be adopted for on-site mixing and unloading operations. Regular sprinkling of the Site by water will be carried out to suppress excessive dust emission(s); ▪ PEQS applicable to gaseous emissions generated by construction vehicles, equipment and machinery will be enforced during construction works; and	■ M/S FDI Technologies Pvt. Ltd Project Manager ■ Contractor

Sr. No	Project Component or Impact	Target	Mitigation	Responsibility
Constructional Stage				
			▪ Ensure precautions to reduce the level of dust emissions from hot mix plants, crushers and batching plants will be taken up; e.g. provide protection canvasses and dust extraction units. Mixing equipment will be well sealed and equipped as per existing standards. ▪ All excavation work will be sprinkled with water; ▪ Vehicles used for construction will be tuned properly and regularly to control emission of exhaust gases.	
5.	Noise	To minimize noise pollution	▪ Selection of up-to-date and well maintained mill or equipment with reduced noise levels ensured by suitable in-built damping techniques or appropriate muffling devices; ▪ Confining excessively noisy work to normal working hours in the day, as far as possible; ▪ Providing the construction workers with suitable hearing protection like ear cap, or earmuffs and training them in their use; ▪ Preferably, restricting construction vehicles movement during nighttime; ▪ Heavy machinery like percussion hammers and pneumatic drills will not be used during the night without prior approval of the Client; ▪ Contractors will comply with submitted work schedule, keeping noisy operations away from	 M/S FDI Technologies Pvt. Ltd. Project Manager  Contractor

Sr. No	Project Component or Impact	Target	Mitigation	Responsibility
Constructional Stage				
			sensitive points; implement regular maintenance and repairs; and employ strict implementation of operation procedures.	
6.	Groundwater	To avoid contamination of groundwater	▪ Protection of groundwater reserves from any source of contamination such as the construction and oily waste that will degrade its potable quality; ▪ The solid waste will be disposed off in designated disposal site to sustain the water quality for domestic requirements; ▪ water required for construction in such a way that the water availability and supply to nearby communities remain unaffected; ▪ Regular water quality monitoring according to determined sampling schedule; ▪ The contractor shall ensure that construction debris do not find their way into the drainage system which can block them; ▪ Prohibit washing of machinery and vehicles in surface waters, provide sealed washing basins and collect wastewater in sedimentation/retention pond.	 M/S FDI Technologies Pvt. Ltd Project Manager  Contractor
7.	Flora	To minimize the impact on floral resources	▪ As discussed in the EIA report there will be no tree cutting involved during the construction phase of this project activity. However new aggressive campaign will be launched for tree	 M/S FDI Technologies Pvt. Ltd Project Manager

Sr. No	Project Component or Impact	Target	Mitigation	Responsibility
Constructional Stage				
			plantation Local species of plants will be used during plantation to avoid any foreign unwanted species of plants.	 Contractor
8.	Fauna	To minimize the impact on birds and their dislocation	- Plantation of large number of trees along the proposed project site and around the industry will be carried out to provide shelter for birds. - Noisy work will not be carried out in night time so that there will be no disturbance to local birds and animals;	 M/S FDI Technologies Pvt. Ltd Project Manager  Contractor
10.	Public Utilities and Infrastructure	To minimize the disturbance to public utilities and infrastructure	Rehabilitation of existing utilities before construction to avoid any inconvenience to the residents of the Project Area or provide them with alternative arrangement during the construction period.	 M/S FDI Technologies Pvt. Ltd Project Manager  Contractor
11.	Traffic Management	To minimize traffic problems in the Project Area	- As discussed in the EIA report the project site is located on the main road it is wide enough to cater any traffic jams so there will be no problem of small number of additional vehicles on this road. However, following mitigation measure will be taken care for the smooth running of traffic; - Movement of vehicles carrying construction materials will be restricted during daytime to reduce traffic load and inconvenience to the local people.	 M/S FDI Technologies Pvt. Ltd Project Manager  Contractor

Table 9—3 Environmental Management Plan of FDI Technologies (Pvt) Ltd (During Operation Phase)

Sr. No	Project Component or Impact	Target	Mitigation	Responsibility
Operational Stage				
1	Flora	Proper maintenance of sapling planted	■ The saplings planted in and around the mill would be properly maintained throughout their initial growth period in terms of water requirement and necessary nutrients. Therefore, proper care of newly planted trees will need special care; ■ An awareness campaign targeted on the neighbourhood farmers/factory owners will be run to popularize the planting of trees; and ■ Organic farming will be encouraged to minimize the use of chemical fertilizers and pesticides.	 M/S FDI Technologies Pvt. Ltd Project Manager
2.	Air Quality	To minimize air quality	■ Setting up of a system to monitor air quality along Project area in accordance with the applicable standards/limits; ■ Construction of shed for raw materials stockyard for iron & ingots, scrap, sponge iron and other raw materials to avoid fugitive emissions. ■ Dust will be collected automatically in Flue Storage Silos through automated conveying system. Flue will be recycled. ■ Raw material storage will be covered and separated to avoid dust dispersion due to wind blowing.	 M/S FDI Technologies Pvt. Ltd Project Manager

Sr. No	Project Component or Impact	Target	Mitigation	Responsibility
Operational Stage				
			■ Idle running of vehicles is minimized during material loading / unloading operations ■ Good housekeeping will be made essential for alloys casting complex. ■ Helping the owners and occupants of the affected premises to identify and implement special measures; ■ Regular road maintenance to ensure good surface condition; ■ Monitoring air quality at defined schedule; and ■ Regular vehicle check to control/ensure compliance with PEQS.	
3.	Noise	To minimize noise pollution	■ Noise measurements will be carried out at locations according to specified schedule to ensure the effectiveness of mitigation measures; ■ Provision of ear muffs/plugs for the workers working in high noise zones; and ■ Provision of sign boards for sensitive zones ■ Tree plantation will be further enhanced on the boundary walls of the factory which will act as additional buffer/barriers for community exposure. ■ Noise generating sources will be enclosed to minimize noise/ vibrations. ■ Vehicles and road maintenance will be done	 M/S FDI Technologies Pvt. Ltd Project Manager

Sr. No	Project Component or Impact	Target	Mitigation	Responsibility
Operational Stage				
			time to time. Loading of vehicles will be under limit.	
4.	Security	To minimize the risk	■ Mitigation measure will include strict enforcement of regulations.	 M/S FDI Technologies Pvt. Ltd Project Manager
5.	Landscape	To improve the aesthetics of the Project Area	■ Plantations in and around the mill will be further enhanced. ■ Fountains are already installed in the existing unit and such measure will also be taken to increase the beauty of area. ■ Outside the mill more plantations will be carried out to further beautify the area around the factory.	 M/S FDI Technologies Pvt. Ltd Project Manager
6.	Community Development	To improve the living standards of the Area	■ A well-managed and well planned community development plan has been prepared and is exercised by the management of STP plant. ■ This plan will be further extended for the welfare of nearby community. This development plan includes: ■ Provision of dispensary for the nearby communities; ■ Employment opportunities for the workers of the nearby communities, ■ Provision of education facilities via Education Trust	 M/S FDI Technologies Pvt. Ltd Project Manager

Sr. No	Project Component or Impact	Target	Mitigation	Responsibility
Operational Stage				
7.	Health, Safety and Environment Plan	To improve the working conditions and environment for the insurance of safe work	■ Provision of all the resources to ensure the safety for workers ■ Personnel protective equipments (gloves, eye shields, mouth shield, ear muffs/plugs, helmet, clothes, shoes etc) will be provided to the employees and workers for safety measures. ■ Training to personnel will be imparted to generate awareness about PPEs and safety. ■ First aid will be provided at work site and training and first aid will be also given to all staff. ■ It will be ensured that workers are not exposed above the threshold limits prescribed above through suitable administrative controls. ■ Long term changes in the infrastructure and machinery to ensure the health of the workers ■ Frequent environmental monitoring of generators and other sources of emissions in the industry. ■ Indoor air quality monitoring specially in the working areas for workforce.	 SHE Supervisor
8.	Solid Waste Management	To save the environmental from degradation	■ Solid waste shall be disposed of by contractor ■ All the legal and obligatory requirements will be fulfilled	 M/S FDI Technologies Pvt. Ltd Project Manager

Sr. No	Project Component or Impact	Target	Mitigation	Responsibility
Operational Stage				
			■ Testing system for Solid Waste Slag will be made in which There will be a “lined” slag pit designed to dispose of the solid waste ■ Solid waste spectrophotometer analyser will be installed for control check. ■ No damage to nearby habitat ■ The generation of solid wastes from process operation will be minimal, including slag generated from manufacturing of Ingots/billets. Dust from bag filter, domestic waste and used / spent oil from machineries shall be carefully handled. ■ Domestic waste from septic tank followed by soak pit will be collected annually and will be used as manure for green belt.	
9	Ground Water	To save the natural resources	■ Water conservation campaign will be launched for the new project in order to minimise the wastage of ground water. ■ New washing techniques will be introduced for water conservation	 M/S FDI Technologies Pvt. Ltd Project Manager

9.7 ENVIRONMENTAL MONITORING PROGRAM

The monitoring program is designed to ensure that the requirements of the NOC awarded by the EPA are met. Monitoring Program (MP) provides important information that allows for more effective planning and an adaptive response based on the assessment of the effectiveness of mitigation measures. The monitoring of various parameters will help to determine the extent to which project construction/operation activities will cause environmental disturbance. Following is a tentative plan for environmental monitoring;

Table 9—4 Environmental Monitoring Plan

Sr. No	Monitoring Parameter	Monitoring Location	Remarks	Monitoring Frequency
A. Construction Stage				
1.	Noise	Construction Vehicle/ Machinery/ generators/Welding work	Construction vehicles / machinery / generators will be checked regularly for noise level by the contractor during construction phase.	Monthly Basis
2.	Smoke Emissions	Construction Vehicle/ Machinery/ generators	Construction vehicles / machinery / generators will be checked regularly for smoke emissions by the contractor during construction phase.	Monthly Basis
B. Operation Stage				
1.	Security	At the Unit	Security arrangement will be made.	During Project Life
2.	HSE Plan	---	Health, safety and Environmental will be monitored on daily basis.	Monthly Basis
3.	Gaseous Emissions monitoring	Generators	Will be carried out on quarterly basis from the stacks of generator and boiler	Monthly Basis
4.	Noise	All plant	On daily basis by the mill management and on quarterly basis by a third party	Monthly Basis
5.	Waste Water Monitoring	From final discharge point of Waste Water Treatment facility	As described by SMART	Monthly Basis

9.8 ENVIRONMENTAL BUDGET

The cost for environmental management and monitoring will be the part of contract of Contractor and Consultants respectively. However, a lump sum amount of Rs. 5 million rupees will be allocated by the project proponent as cost for environmental management program for a period of two years during construction and operation of the project. After that, monitoring program will be revised in consultation with EPA and cost will be revised accordingly.

The cost estimated for implementing EMP will be 5 million rupees. The details are given in table 9.5.

Table 9—5 Summary of EMP Cost

Sr. No	Parameter	Cost (Pak Rupees)
1.	Greenbelt Development	1.5 Million
2.	Solid Waste Management	0.5 Million
3.	Health & Safety	0.5 Million
4.	Pollution Control System	2.5 Million
Total		5 Million

9.9 TREE PLANTATION

9.9.1 Planning of Site for Plantation

- Site selection
- Arrangement of work Plan
- Site preparation for plantation

9.9.2 Choosing Species

There are many conifer (needle-bearing) and hardwood (broadleaf) tree and shrub species available through private nurseries to help to meet objectives.

Common Termed	Botanical Name	Height	Type	Growing/flowering Season	Picture
Khair/Katha	<i>Acacia Catechu</i>	10-12m	Evergreen	May-June	

Common Termed	Botanical Name	Height	Type	Growing/flowering Season	Picture
Phulai	<i>Acacia Modesta</i>	Medium	Deciduous	April-May	
Shatin	<i>Alstonia Scholaris</i>	10-15m	Evergreen	October-December	
Kachnar	<i>Bauhinia Veriagata</i>	8-12m	Evergreen	September-December	
Kaghzi Tut	<i>Broussonetia Papyrifera</i>	18-25m	Deciduous	March	
Holmskioldia	<i>Holmskioldia Sanguine</i>	5-8 ft	Perennial	Spring/Summer	
Anoora, Noora	<i>Acacia Aneura F Muell</i>	4 to 5 m	Semi Deciduous	March-October	
Bail, Katori	<i>Aegle Marmelos (L) Correa</i>	20-25'	Deciduous	Summer	
Kangi Palm	<i>Cycas Revoluta</i>	6 feet	Evergreen	Spring	
Putranjan	<i>Putranjiva Roxburghii Wall</i>	18 m	Mostly Deciduous, Evergreen	Tolerant to all	

Deciduous: Trees and shrubs that, unlike evergreens, lose their leaves and become dormant during the winter.

Evergreen: An evergreen tree is a plant that has leaves throughout the year and is always green.

Perennial: They grow for more than two years. These are non-woody plants that die back to the ground each fall. The roots, however, survive the winter and the plants re-sprout in the spring.

9.10 GREEN BELT DESIGN

Extensive tree plantation will be carried out to act barrier to control escape of odor, if any, in the surrounding areas. As a part of tree plantation plan, plants which are moderately tolerant to the pollutants but are endowed with fast growing, dense foliage canopy will be planted. The number of plants to be grown along the boundary line of the area will be estimated after physical survey of the during construction and will be approximately **1000** in single row with a tree to tree distance of **5ft/1.5m**. The trees planted here will have dense spreading canopy. The trees will also be grown along the roads and the open stretches. This area will not only act as to reduce the pollution but also will increase the aesthetics of the area. So the trees grown in this area must be flowering as well ornamental plants. All along the boundary of the treatment plant, a strip of plantation with trees which are tall in nature and evergreen in habit. This area will act as a barrier and as far as possible check the pollutants from their escape and potential contamination of other components of local environment.

9.10.1 Lawn Planting

No lawn shall be planted when temperatures are above 90° F or if the ground is in a muddy condition/ or other conditions that are unsuitable in the area. The sweet soil surface shall be moistened with a fine spray immediately before planting.

The lawn shall be planted according to acceptable standards practice in order to ensure a completely healthy grass cover. The planting procedures shall be approved by designated person at site.

9.10.2 General Landscape Protection

Planting areas and plants shall be protected all times against trespassing and damage of all kinds for the duration of maintenance period. If any plant/s become damage or injured, they shall be treated or replaced. Protection shall also include all temporary protections fences and barriers, all signs and all other work incidental to proper maintenance.

9.11 EMERGENCY RESPONSE PLAN & EVACUATION EXIT PLAN

9.11.1 Objective of Emergency Response Plan

Emergency preparedness helps to minimize the human suffering and economic losses that can result from emergencies. It will be understood that the size and density of projects, as well as their access and location, have a bearing on the degree of planning necessary for emergencies. It is therefore strongly recommended that the constructor ensure that a member of staff on site assist in developing the emergency response plan.

9.11.2 Scope of Emergency Response Plan

This plan assesses risk, assign role and responsibilities and give the major steps to be followed in any emergency situation. It increases understandings of workers and officials in handling different emergency situations which may occur at project area.

9.11.3 Emergency Situations

Following emergencies may occur at workplaces:

- Fire
- Fuel spillage
- Gas leaks
- Explosions
- Injury from machinery and equipment
- Fall, climbing accident
- Emergency as a result of environmental conditions (e.g., heat, cold, wet, snow, wind, lightning, bushfires, floods, high seas, cyclones) emergencies requiring evacuation
- Hazardous substances and chemical spills
- Internal emergencies such as loss of power or water supply and structural collapse
- Serious injury events or medical emergencies
- Bomb threats
- Civil disorder or criminal acts such as robberies and shootings

9.11.4 General Evacuation Procedure

It is not always necessary to evacuate a building during an emergency. A power outage, for instance, does not necessarily call for evacuation of a building of mill. The overall safety of the building must first be evaluated: lighting, hazardous materials, ventilation systems, and other hazardous operations. If the building can be safely occupied, evacuation is not necessary. In the case of evacuation the workers in the effected zone receive instructions from their supervisor or designated person. As per instruction the workers will immediately leave their places of duty and assemble at the assembly point.

- Area supervisor will roll call the employees to ensure all are out of danger zone.
- On receiving first information of emergency situation the administrative head will contact the Security Officer to ensure that alarm system is activated or not.
- After assessing the emergency situation Security Officer or designated person instruct through telephone to initiated the emergency response procedure and call the responsible personnel at site.
- Administrative Head may also call the external help like fire brigade, police, bomb disposal squad, ambulance etc. and communicate with them.
- Security Officer after consulting the Administrative Head may order the evacuation of workers from affected area.

If evacuation is ordered, follow these procedures:

- Stay calm, do not rush, and do not panic.
- Safely stop your work.
- Gather your personal belongings if it is safe to do so.
- If safe, close your door and window, but do not lock them.
- Use nearest safe stairs and proceed to nearest exit. Do not use the elevator.
- Wait for any instructions from emergency responders.
- Do not re-enter the building or work area until you have been instructed to do so by the emergency responders.

9.11.5 Fire Emergency Response Plan

In the case of fire emergency, following emergency response steps will be followed:

- When any employee notice fire or smoke he must immediately decide if the nature of fire is such that he could take action on his own or verbal call for help.
- If it is considered to be beyond the scope of individual control the alarm will be raised.

- The Security supervisor will immediately reach that area and simultaneously called for the emergency response procedures.
- After the alarm called for fire emergency all the members of fire squad will reach the affected area and take instruction of Fire Master.
- If fire reaches the raised alarm state the members are allowed to leave the area except one guard for the main gate to guide the external Fire Brigade helpers.
- Off-duty key personnel and security staff will also report immediately for duty.
- Equipments will be removed from the affected area.
- The nearest hospital will be informed for possible casualties.
- In addition of fire fighting, supervisor will ensure all the flammable articles are removed.

9.11.5.1 Special Fire Emergency Response and Fire-protection precautions

- **“Joint Code of Practice”** includes fire protection measurements and compliance with the regulations and requirements is to tackle with fire emergency in multistory building.
- **Fire-Resistant Materials-** To ensure the stability of a high-rise building in the event of a fire, the supporting structure and ceilings must be resistant to fire. The characteristic “fire resistant” must be defined in the applicable standards. However, this means that the requirements to be met by fire resistant parts can easily differ from one country to the next, depending on the standards applied. The same holds true for the inspection procedures specified for verification.
- **Fire Compartments** Fire can also spread via the outer facade if windows have been shattered by the heat so it is perfectly appropriate to use fire resistant glazing, Partition walls, ceilings must be fire resistant and made of noncombustible materials.
- **Doorways** will at least be sealed with tightly closing, fire-retardant doors; any other openings required in the walls must be sealed in an equivalent manner.
- **Partition walls** in corridors will reach right up to the structural ceiling.
- **Smoke vents** must be installed at the top of all stairwells; internal stairwells must be equipped with a mechanical, automatically activated ventilation system connected to an emergency power supply. If a fire breaks out, excess pressure must be generated in the stairwells to prevent the ingress of smoke.
- **Ventilation and Air-Conditioning Systems-** Ventilation and air-conditioning systems must be installed in such a way that fire or smoke cannot be transmitted to stairwells and other floors or fire compartments.

- **Fire Fighting-** Fire extinguishers, fire-fighting water to every point on floor and an automatic sprinkler system is the most effective protective measure for fighting and controlling a fire.

9.11.5.2 Supportive Services

One electrician, one mechanic and four general workers (for salvage operations) will be arranged to ensure the necessary services to unaffected areas continue and removal of any equipment etc. which may be affected by the incident.

Table 9—6 Fire Extinguishing Methods

Fire Class	Status of fire	Extinguishing Method	Type of Extinguisher to be used	Color Coding
A	Solid combustible material	Cooling	▪ Dry chemical powder (DCP) ▪ Water type ▪ Halotron	▪ Blue ▪ Red ▪ Green
B	Flammable Liquid	Cut off supply	▪ Foam ▪ Carbon dioxide CO₂ ▪ Dry chemical powder (DCP) ▪ Halotron	▪ Yellow ▪ Black ▪ Blue ▪ Green
C	Flammable/ Explosive gases	Cut off supply	▪ Carbon Dioxide CO₂ ▪ Dry Chemical ▪ Dry Chemical powder (DCP)	▪ Black ▪ Blue ▪ Green
D	Fire in Combustible Metal	Smothering & Starvation	Dry Chemical Powder (DCP)	Blue
E	Fire due to Electricity	Smothering & cut off supply	▪ Carbon dioxide (CO₂) ▪ Dry chemical powder (DCP) ▪ Halotron	▪ Black ▪ Blue ▪ Green

9.12 PERSONAL PROTECTIVE EQUIPMENTS (PPE'S)

PPE, Personal Protective Equipment, are the tools that ensure the basic health protection and safety of users. PPE is any device or appliance designed to be worn by an individual when exposed to one or more health and safety hazards. PPE includes all clothing and other work accessories designed to create a barrier against workplace hazards, and using PPE requires

hazard awareness and training on the part of the user. Employees must be aware that the equipment does not eliminate the hazard; if the equipment fails, exposure will occur. To reduce the possibility of failure, equipment must be properly fitted and maintained in a clean and serviceable condition. List of important protection equipment (PPE's) are given in table 9.7.

Table 9—7 List of Important Protection Equipment (PPE's)

Protected Part	PPE's
Protection against electric shock	∞ Insulating gloves & shoes ∞ Insulated tools ∞ Safety belt against falls
Protection of eye	∞ Goggle ∞ Shields ∞ Dust screen
Protection of face and eye	∞ Safety hamlets ∞ Shields ∞ Hoods
Protection of arms, hand and fingers	∞ Finger cots or stalls ∞ Gloves band cuff
Protection of foot and leg	∞ Safety shoes ∞ Guards
Protection of Head	∞ Protective caps ∞ Hard hats
Protection of ears against noise	∞ Ear plug ∞ Helmet
Protection of respiratory system	∞ Respirator ∞ Gas mask ∞ Hose mask blower
Protection of skin and body against heat of fire	∞ Flame resistant coveralls ∞ Face shields

STAKEHOLDERS CONSULTATION

10 STAKEHOLDERS CONSULTATION

Stakeholder consultation is a means of involving all primary and secondary stakeholders in the project's decision-making process in order to address their concerns, improve project design, and give the project legitimacy. Stakeholder consultation, if conducted in a participatory and objective manner, is a means of enhancing project sustainability. Community input (both of knowledge and values) on socioeconomic and environmental issues can greatly enhance the quality of decision-making. Stakeholder consultation was therefore conducted in the project area not only to satisfy the legal requirements of the EIA process in Pakistan but also to improve and enhance the social and environmental design of the project.

10.1 PROPONENT ENVIRONMENT MANAGEMENT TEAM

Environment Management Team of FDI Technologies Pvt Ltd includes the following members for smooth operation of Effluent treatment plant

- Project Manager
- HSE Officer
- Process Plant Engineer
- Waste Management Team
- Electrical Technician

The above all members will be hired after the completion of construction activities

10.2 THE RESPONSIBILITY AUTHORITY

The FDI Technologies Pvt Ltd management shall be the responsible authority to take all measures prior to start the project and during operation.

10.3 OTHER DEPARTMENTS AND AGENCIES

For the impact analysis detailed with the management, local community, educational institutes, industrial locals. All issues were discussed related to implementation of the project. Scoping sessions, focused group discussion and way side consultations were held with the relevant stakeholders in the area.

10.4 ENVIRONMENTAL PRACTITIONERS AND EXPERTS

During visit to the project site, discussion with stakeholders and consulted with the local people of nearby and other towns to evaluate the project socio-economic impacts. People of

the area belong to different professions like mostly belong to employment, own businesses, doctors, some in abroad, teaching, in agriculture etc. women were also consulted for their point of view regarding the betterment of the area by this project, some of them communicated but according to social value of the area they mostly hesitate to communicate comfortably and get pictured. People provide the massive information about the project and have positive remarks regarding the project development.

10.5 AFFECTED AND WIDER COMMUNITY

There is no affected community present in the area of the proposed project. Team has consulted with the inhabitants or neighboring areas. The remarks of people are positive regarding the project and people foresee positive impacts like employment opportunities, business, development of the area etc.

CONCLUSION AND RECOMMENDATIONS

11 CONCLUSIONS AND RECOMMENDATIONS

Based on the study conducted for Environmental Impact Assessment (EIA) of the project, the following recommendations are made:

- Plantation as far as permissible and within the scope of the project is carried out.
- Sustainable development approach through conservation of natural environment is followed.
- Environmental aspects of the project will be well taken care through implementation of the Environmental Management & Monitoring Plan as recommended in this report.
- The project management may adopt “cleaner and greener environment” as its motto and this will make the project more environment friendly.

On the basis of the findings of the EIA, it is concluded that the project will not pose any adverse impact on the local population and the environment. Therefore, it is recommended that the competent authority may please be issues Environmental Approval for the construction and operation of this project.

REFERENCES

REFERENCES

Listed below are some of the documents, reports and other references consulted during the preparation of this report:

- a. Information and data provided by project proponents;
- b. Project Pre-feasibility Study Report;
- c. Technical Design Data related to the project.
- d. Information gathered through discussions with the project related persons of the project proponent;
- e. Information collected from the Technical documents of various suppliers of machinery/equipment.
- f. Punjab Environment Quality Standards for Ambient Air November 2010;
- g. Punjab Environment Quality Standards Noise Levels November 2010;
- h. Punjab Environment Quality Standards for Drinking Water November 2010;;
- i. Pakistan Environmental Protection Act, 1997;
- j. The Punjab Environmental Protection (Amendment) Act 2011 covers aspects related to:
 - i. The protection, conservation, rehabilitation and improvement of the environment and the prevention, control of pollution and promotion of sustainable development;
 - ii. Establishing complete regulatory and monitoring bodies, policies, rules, regulations and Punjab environmental quality standards; and
 - iii. To ensure enforcement, the act establishes regulating bodies i.e. Punjab Environmental Protection Council (PEPC) and responsible bodies i.e. Punjab Environmental Protection Agency (Punjab EPA) at Provincial level.
- k. Environment related Laws in Pakistan and the Province of Punjab;
- l. Government of Pakistan, Pakistan Environmental Protection Agency, Policy and Procedures for Filing, Review and Approval of Environmental Assessment, 2000;
- m. Google earth, maps.

- n. Guidelines for Public Consultations - These guidelines cover:
- Consultation, involvement and participation of Stakeholders
 - Techniques for public consultation (principles, levels of involvements, tools, building trust)
 - Effective public consultation (planning, stages of IEE where consultation is appropriate)
 - Consensus building and dispute resolution.
- o. workplace safety and health act 2011
- p. Land Acquisition Act (LAA) of 1894
- q. The forest Act 1927
- r. Pakistan Penal Code, 1860
- Provincial Wildlife Act, 1974

TERMS OF REFERENCES

TERMS OF REFERENCES

1. The Consultant is required to carry out an Environment Assessment Study of the Project as required under section 12 of Pakistan Environmental Protection Act 1997/ Punjab Environmental Protection Act 2012.
2. The Study should be comprehensive and should cover all aspects which are envisaged under the relevant national and provincials laws & regulations including but not limited to:
 - Identification and recommendation for suitable solution/treatment/mitigation measures of emissions and effluents such as waste water and sludge etc in accordance with Punjab Environmental Quality Standards (PEQS).
 - Identification and recommendation for suitable solution/treatment/mitigation measures of solvents, oils (tar), hazardous waste, organic compounds, steam, flue gases, particulate matter and chemical compounds harmful for the environment and other substances leading to air, noise, water and soil pollution in accordance with PEQS.

The Study should be acceptable to the relevant national and/or provincial authorities (relevant authorities) in Punjab.

GLOSSARY

GLOSSARY

Air Quality	Measurement of the pollutants in the air; a description of healthiness and safety of the atmosphere.
Aluminum	Aluminum is the most abundant metallic element in Earth's crust and the most widely used nonferrous metal.
Consultation	Consultation refers to two-way transfer of information or joint discussion between project staff and the affected population. Systematic consultation implies a sustained and rigorous sharing of ideas. Bank experience shows that consultation often yields the best resettlement alternatives, fruitful procedures for continued participation, and independent information on actual conditions for implementation.
Coordinates Contaminate	Each of a group of numbers used to indicate the position of a point, line, or plane to make impure, pollute.
Environmental Management	Attempt to control human impact on and interaction with the environment in order to preserve natural resources.
Land Acquisition	The process whereby a person is compelled by a public agency to cede all or part of the land a person owns or possesses, to the ownership and possession of that agency, for public purpose in return for compensation.
Mitigation	The action of reducing the severity, seriousness, or painfulness of something.
Monitoring	Supervising activities in progress to ensure they are on-course and on-schedule in meeting the objectives and performance targets.
Production Capacity	Production Capacity is the volume of products or services that can be produced by an enterprise using current resources.
Proponent	A person who advocates a theory, proposal, or course of action.
Rehabilitation	Include all compensatory measures to re-establish; at least lost incomes, livelihoods, living and social systems. It does not include the payment of compensation for required assets.

Resettlement	Means all measures taken to mitigate any and all adverse impacts, resulting due to execution of a project on the livelihood of the project affected persons, their property, and includes compensation, relocation and rehabilitation.
Spectrophotometer	A spectrophotometer is an instrument that measures the amount of photons (the intensity of light) absorbed after it passes through sample solution.
Stakeholders	Include affected persons and communities, proponents, private and public businesses, NGOs, host communities and EPA.
Ton	A unit of gross internal capacity, equal to 100 cu. ft (2.83 cubic meters).
Topography	Details of the surface features of land. It includes the mountains, hills, creeks, and other bumps and lumps on a particular hunk of earth.