F-232(EIA)-23

LIBERMANN INTERNATIONAL

ENVIRONMENTAL IMPACT ASSESSMENT (EIA REPORT)

SIALKOT TANNERY ZONE, KULUWAL ROAD CHOWK
KHAMBRANWALA, SUMBRIAL

ASIAN VERIFICATION (PVT) LTD
19 KM FEROZEPUR ROAD, 1 KM KALAMKAR ROAD, LAHORE
PAKISTAN

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ENVIRONMENTAL IMPACT ASSESSMENT REPORT

SUBMITTED FOR CONSTRUCTION PHASE NOC

Report submitted by

M/S Libermann International

Proponent: Shafiq Ul Islam

Postal Address: Plot 284-A, 5km Sialkot Airport road,
Kuluwal road, Chowk Khambranwala, Smabrial
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List of Abbreviations

BC	Before Construction
DC	During Construction
DO	During Operation
BDL	Below Detectable Limit
BOD	Biological Oxygen Demand
COD	Chemical Oxygen Demand
DW	Drinking Water
ECO	Environmental Consultancies & Options
EMP	Environmental Management Plan
GWM	Global Waste Management
TDS	Total Dissolved Solids
WW	Waste Water
EHS	Environmental, Health, and Safety
EIA	Environment Impact Assessment
EMP	Environmental Management Plan
EPA	Environmental Protection Agency
GOP	Government of Pakistan
IEE	Initial Environmental Examination
NOC	No Objection Certificate
PEP Act	Pakistan Environment Protection Act 1997
PEPC	Pakistan Environmental Protection Council

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WWTPs	Waste Water Treatment Plants
CETP	Combined Effluent Treatment Plant
STZ	Sialkot Tannery Zone

Glossary

- EIA (Environmental Impact Assessment): It is the process of identifying, predicting, evaluating and mitigating of effects of biophysical, social and other relevant proposed projects and physical activities prior to major decisions and commitments being made.
- IEE (Initial Environment Examination): Initial examination of projects for identification of hazards of project. Topography: Physical features of any area including soil, water and air are called topography.
- PEPA (Pakistan Environmental Protection Act 1997): An act to provide the protection, conservation, rehabilitation and improvement of environment, for the prevention and control of pollution and promotion of sustainable development.
- Fauna: Word used for combination of all the species of animals. Flora: Word used for combination of all the species of plants.
- . EMP (Environmental Management Plan): An EMP is a site-specific plan developed to ensure that all necessary measures are identified and implemented in order to protect the environment and comply with environmental legislation.
- NOC (No Objection Certificate): It is a kind of clearance issued by EPA necessary for any project to be constructed.
- "Drying" One of the simplest forms of curing hides and skins; now chiefly use for goatskins coming from areas where other forms of cure would be difficult, or where salt is not available. The skins are dried spread out in the sunshine or in the shade with good ventilation and are called flint-dried when completely cured because of their hardness.
- "Fleshing " Removal of the fatty layer usually by fleshing machine that helps with the penetration of chemicals into the skin in subsequent process stages. Can be done when the hide is in the green state or fater the liming process.

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- "Laws": means state and local laws and all regulations, rules, orders, decrees, decisions, instructions, requirements, policies and guidance which are issued or made by any Relevant Authority and which are legally binding, as any of them may be amended from time to time.

- "Personal Protective Equipment" (also PPE): Clothing and equipment worn by pesticide mixers, loaders and applicators and re-entry workers, hazmat emergency responders, which is worn to reduce their exposure to potentially hazardous chemicals and other pollutants.

- "pH scale" A measure of the relative acidity and alkalinity of a solution; solutions having a pH value of 7.0 are neutral; (neither acidic or alkaline); pH-values 1 to 6 denote acidity; pH values of 8 to 14 denote alkalinity.

- "Residual Waste" means all municipal solid wastes that are not processed and/or recycled.

- "Risk Assessment": Qualitative and quantitative evaluation of the risk posed to human health and/or the environment by the actual or potential presence and/or use of specific pollutants.

- "Solid Waste Management" means any activity involving the handling, treatment and disposal of Solid Waste. Also means any supervised handling of waste materials from their source through recovery processes to final disposal.

- "Tanning" The addition of tanning chemicals to the skin. Once tanned, the hide or skin will not rot

- "Waste" means any movable articles or material for which their owner wishes to relinquish responsibility by Disposal or which must be removed from their holding place as waste to safeguard the common welfare and to protect the environment.

- "Washing" A tannery operation whereby hides and skins are washed in clear water after having been soaked to remove curing agents, dirt, blood and manure.

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Table Of Figures

Figure 1 Proposed Project Location.....25
Figure 2 Receptors Within 1-KM 27
Figure 3 The share (%) of chrome oxide discharged into effluent 32
Figure 4 Main components of a raw hide or skin prior to processing in a tannery. 33
Figure 5 Input / output overview for a chrome-tanning process for bovine salted hides2.....34
Figure 6 Mechanical Desalting Drum.....36
Figure 7 Brush Type Desalting Machine 37
Figure 8 Dome type DODECA Wooden Frame 37
Figure 9 Distance of Proposed Site From nearby residential area.....45
Figure 10 Site Selected For Proposed Construction 45
Figure 11 Road Access Map.....46
Figure 12 Vegetation Feature on-site.....46
Figure 13 Project Process Flow Chart.....47
Figure 14 Ground Water Testing 56
Figure 15 Ambient Air Quality Monitoring.....57
Figure 16 Ambient Noise Monitoring.....57
Figure 17 Gender Composition in Sialkot.....61
Figure 18 Proposed Parking Areas.....86

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Contents

List of Abbreviations 3

Glossary 4

Executive Summary 12

1. Title and Location of Project 12

2. Proponent Details 12

LEGAL FRAMEWORK 14

- Punjab Environmental Protection Act (PEPA-97) 14
- Environmental Institutional Structure 14
- Environmental Compliance and Requirements 14
- Wildlife Act 1974 15
- Waste Disposal 15
- Antiquities Protection Act 1975 15
- Factories Act 1934 15
- Canal and Drainage Act 1873 15
- Pakistan Penal Code 1960 16

The major impacts 16

Chapter 1: INTRODUCTION 22

1.2 Identification of the project and proponent 22

1.2.1 Proponent: 23

1.3 Details of Consultant 23

List of Names, Qualifications carrying out IEE/EIA 23

CHAPTER 2: SCREENING 26

Chapter 3: Scoping 27

3.1 Spatial and Temporal Boundaries of Environmental Assessment 27

3.2 Important issues and concern raised during consultation 27

3.3 Significant impacts and factors to be determined 28

Chapter 4: Considerations of Alternatives 29

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4.1 Site Alternatives, their selection and rejection criteria 29
4.2 Environmental Alternatives, their selection and rejection criteria 29
4.3 Design/technology alternatives, their selection and rejection criteria 30
Chapter 5: Description of the Project 44
General 44
5.1 Project Objectives 44
5.2 Location and Site layout of Project: 44
5.3 Land Use On-Site 45
5.4 Road Access 46
5.5 Vegetation Features 46
5.6 Operational Process Flow chart 47
5.7 Process Description 48
- Trimming 48
- Main-Soaking: 48
- Liming: 48
- Fleshing: 49
- Deliming and Bating: 49
- Pickling: 49
- Tanning: 49
- Basification: 50
- Wet-blue storage: 50

5.8 Water requirements: 51
5.8.1 Waste water treatment: 51
Chapter 6: Description Of the Environment 53
6.1 PHYSICAL ENVIRONMENT 53
6.1.1 Topography 53
6.1.2 Top Soil and Geology 53
6.1.3 Seismology 53

Scanned with CamScanner

6.1.4 Climate 53
a. Temperature 53
b. Rainfall 54
c. Humidity 54
d. Wind 55
6.2 BASELINE CONDITIONS 56
6.2.1 Groundwater Conditions 56
6.2.3 Ambient Air Quality 56
6.2.4 Ambient Noise 57
6.3 ECOLOGICAL ENVIRONMENT 57
6.3.1 Flora and Forests 58
6.3.3 Rare/Endangered Species and Protected Areas 59
6.4 SOCIOECONOMIC ENVIRONMENT 59
6.5 Settlement Pattern 60
6.6 Demographic Characteristics of the Population 60
6.7 Family Size and Gender Composition 60
6.8 Literacy Status 61
6.9 Occupation 61
6.10 Average Income of sample household 62
6.11 Availability of Basic Infrastructure 62
6.11.1 Women Issues 63
CHAPTER 7: POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES 63
7.1 Environmental Impacts due to project location 63
7.1 Mitigation Measures for location phase impacts 64
7.2 Environmental Impacts due to the project design 64
7.3 Mitigation measures and recommendations 66
7.4 Environmental Impacts during the construction phase 66
7.4.1 Impacts on the Physical Environment 68

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7.4.2 Impacts on Biological Environment 70
7.4.3 Impacts on Socioeconomic Environment 71
7.4.4 Workers Accidents and Hazards during Construction 73
7.5 Mitigation Measures 76
7.5.1 Environmental Impacts: 76
7.5.2 Socioeconomic Impacts: 77
7.5.3 Biological Impacts: 78
7.5.4 Measures for Workers Safety 79
Chapter 8: Environmental management and monitoring program 82
8.1 Purpose and Objectives of the EMP: 82
8.2 Management Approach: 82
8.3 Institutional Capacity 82
8.4 Training Schedules 83
8.5 Training of building contractor 83
8.6 Responsibility of EMP 83
8.7 Environmental Mitigation Plan by Sialkot Tannery Zone 85
8.7.1 Details of Non Saleable land for public utility buildings and civic amenities 85
8.7.2 Green Areas 85
8.7.3 Roads & Pavements 85
8.7.4 Proposed Infrastructure and Utilities 86
8.7.5 Road 86
8.7.6 Effluent Drain System 87
8.7.7 Sewerage System 87
8.7.8 Drainage System 87
8.7.9 Electric Supply System 87
8.7.10 Pollution Control Using Effluent Treatment and Recycling Plant 87
CHAPTER 9: STAKEHOLDERS CONSULTATION 89
General 89

Scanned with CamScanner

9.1 Consultation Mechanism 89
9.2 Proponents Environmental Management Team 90
9.3 The responsible authority 90
9.4 Other Departments and Agencies 91
9.5 Consultation with Government Departments 91
9.6 Environmental Practitioners and experts 91
9.7 Affected and Wider Community 92
References 94

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Executive Summary

1. Title and Location of Project

This executive summary presents an overview of the main findings of the Environmental Impact Assessment (EIA) Report for the Construction Phase NOC by M/s Libermann International at Plot 284-A, 5km Sialkot Airport road, Kuluwal road, Chowk Khambranwala, Smabrial Sialkot Tannery Zone. Coordinates of the site are Latitude 32°33'35.0"N and Longitude 74°24'37.1"E. The proponent is voluntarily filing an Environmental Impact assessment for its Constructional unit and keen to obtain NOC from EPA because of his commitment to environment, for the regularization of the operations and to fulfill the requirement of international clientage.

2. Proponent Details

M/S Libermann International

Proponent: Shafiq Ul Islam

Postal Address: Sialkot Tannery Zone Kuluwal Road Chowk Khambranwala, Sumbrial

Email: shahid.saleem@nizamsons.com, Irfan.Qadir@nizamalam.group

Contact: 03454599100

3. Name of Organization preparing the report

M/s Asian Verification Pvt Ltd has been engaged for conducting EIA Study of the above stated project. The main objectives of the said project are to establish baseline environmental conditions, identify potential environmental impacts and to suggest suitable mitigation measures accordingly.

4. A brief outline of the proposal (type, process, technology and land requirement)

As per Punjab Environmental Protection Act 1997 (amended 2012) and Initial Environmental Examination (IEE) & Environmental Impact Assessment (EIA) Regulations, 2000 the said project falls in the ***Category-B (Manufacturing and Processing of the projects mentioned in Schedule II).***

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The current project is about Obtaining Constructional NOC of Leather factory before its Operation. Site selected for proposed project is present within the premises of Sialkot Tannery Zone and under the ownership of company. It is an Environmentally Friendly operation of Leather industry. The Company has already established tannery in Sialkot but due to shifting of tanneries in Sialkot tannery zone the company has decided to shift its operations towards a more sustainable approach.

The estimated project cost of the tannery is **PKR 600 Million approx.** And the breakdown of the project cost and detail process of the proposed project is given in **Chapter 05** of this EIA Report.

A Brief Outline Of The Project

Name of the project:	**Proposed Construction of tannery unit** **M/s Libermann International**
Location of the project:	Plot 284-A, 5km Sialkot Airport road, Kuluwal road, Chowk Khambranwala, Smabrial, Sialkot Tannery Zone.
Proposed Area:	Total area of the industry is 11 kanal while covered area is 60000 SFT.
Nature of Project:	Subject project is proposed Construction of a tannery unit.
Cost of the project:	Total cost of the project will be approx. 600 million rupees.
Project process:	Project process will include the manufacturing of Finished Leather from Raw hide skin by the process of tanning.
Raw materials	Raw Hide/Skin will be the raw material of the project process.
Production capacity	40,000 Sq ft / day will be the production capacity of the project.
Power Requirement:	The predicted total electrical load for tanning unit is up to

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	4900 KW which is fulfilled by WAPDA.
Labor/ Workforce:	During construction: 500 (estimated) During Operation: 200 (estimated)
Water Requirement:	During the constructional phase of the project approximately 1500000 gallon water will be required per day for constructional and domestic uses.
Solid waste:	Approx. constructional and domestic waste is 1500 kg/day will be produced during the constructional phase of the project.

LEGAL FRAMEWORK

- **Punjab Environmental Protection Act (PEPA-97)**

National Assembly passed PEPA-97 for the protection, conservation, rehabilitation and improvement of the environment for the prevention, control of pollution, and promotion of sustainable development. After the 18th Amendment and the transfer of powers to the provinces and independence of the provinces Environmental Protection Agency, Punjab has amended the Environmental Protection Act 1997 in 2012. Section 12 of the PEPA-97 (amended 2012) states that no proponent shall commence construction or operation until an Initial Environmental Examination (IEE), or where the project is likely to cause an adverse environmental effect, an Environmental Impact Assessment (EIA) be filed with the environmental protection agency for review and approval prior to project construction.

- **Environmental Institutional Structure**

The structural setup of agencies/departments in the environmental sector is such that the Punjab Ministry of Environment governs and regulates environment-related work at the government level. The PEPA 1997 (amended 2012) works directly under the control of ministry at the provincial level.

- **Environmental Compliance and Requirements**

It is required under the PEPA-97 (amended 2012) that:

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- All operations must comply with the Punjab Environmental Quality Standards (PEQS).
- IEE and EIA are submitted to the provincial EPA for clearance and issuance of No Objection Certificate (NOC)/Environmental Approval.

- **Wildlife Act 1974**

Punjab Wildlife Protection, Conservation and Management Act 1974, requires protecting the wildlife species declared as endangered/threatened and rare. The act gives protection to these species by declaring their natural living environment as protected and reserved such as national parks, wildlife sanctuaries, and game reserves. The construction and operation of the wastewater treatment activities must not disturb their nesting, breeding and/or resting-places. It must not also cause physical damage to the animals and their habitats, in which they live and act.

- **Waste Disposal**

The Punjab Local Government Ordinance 2001 currently Punjab Municipal Corporation 2016 states that an urban local council shall make adequate arrangements for the removal of refuse from all public roads and streets, public latrines, drains, and all buildings and lands vested in the urban local council and proper disposal of such refuse.

- **Antiquities Protection Act 1975**

The act provides protection and preservation of historically and archaeologically important sites. The project development activities must take into account the location and other activity patterns around historically important sites and should take all measures to protect and preserve the original character of such areas of historical and/or archeological importance.

- **Factories Act 1934**

The clauses relevant to the project are those that concern the health, safety and welfare of workers, disposal of solid waste and effluent, and damage to private and public properties. The act also provides regulations for handling and disposing of toxic and hazardous materials.

- **Canal and Drainage Act 1873**

The act prohibits fouling of channels, watercourses, reservoirs and tube wells by industrial and/or domestic pollution. The proposed tannery construction and its waste water discharge

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, it will discharge treated industrial effluent with parameters having concentration within the PEQS limits.

- **Pakistan Penal Code 1960**

The Pakistan Penal Code deals with the offences where public or private properties and/or human lives are affected due to intentional or accidental misconduct of an individual or body of people. In the context of environment, the Penal Code, however, can provide a basis for the PIE to coordinate its activities with the local authorities to ensure that its construction activities do not become a cause of public nuisance or inconvenience

The major impacts

In order to identify all the activities associated with the project during operation phase with potential to cause adverse environmental impacts and harm a thorough review has been conducted. Project does not have any significant adverse impacts on the nearby community and on environment. Overall the project has positive impacts on the local population and country as a whole. Moreover, extensive plantation is present for air purification within the unit vicinity.

Table: Summary of Environmental and social impacts of the project during the construction phase and mitigation measures suggested:

Potential Impact	Criteria for determining Significance	Key Mitigation Measures
Dust Emissions—Particulate matter emitted during construction activities and gaseous emissions from site generators and transportation vehicles can result in deterioration of ambient air quality in the vicinity of the project site, and be a	PEQS for Ambient Air	Sprinkling of water on dusty tracts and surfaces is recommended; Use of wind shield around stockpiles isrecommended; Vehicle speed restrictions should be applied in the project area; Raw materials should be transported incovered trucks; Ensuring that no stockpile is within 250

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nuisance to the surrounding workers.		m of the community.
Construction Noise- Disturbance to surrounding communities due to operation of construction machinery at the project site.	PEQS for Noise OSHA standards	Activities generating high levels of noise should be minimized at the project site. If the noise level will exceed the permissible limits with reference to national and OSHA standards, following recommendations are suggested to take action against the high noise levels: • Proper tuning of construction machinery and vehicles is recommended. • Training of the person and professionals involved in the installation of the plant is recommended. Ear muffs and ear plugs are recommended in case of high noise levels.

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Solid waste Management— Improper waste management may generate health and aestheticissues	Generation of excessive waste; Recyclable waste and reusable waste is discarded; Littering; Improper disposal.	Proper solid waste management plan should be devised and implemented; Constructional waste should be utilized for road filling and maintenance. Domestic waste should be disposed of properly, handed over to contractors, placed in bins.
Vegetation Loss/ Soil erosion— Loss of vegetation as a result of land clearance for the construction Purpose.	Unnecessary or excessive removal of trees and shrubs	Preparation of a Reinstatement Plan; Minimization of the felling of trees andclearing of vegetation; and avoidance of the use of fuel wood.
Water Resources— The extraction of water for the project construction activities can affect the groundwater availability for the project area communities	Water extracted for the project has directly affected the ability of the community to meet their water needs	No impact on the community groundwater needs is envisaged as a result of the project.
Soil Contamination—Oil and chemical spills can contaminatethe soil	Presence of visible amount of hydrocarbon in soil	Provision of spill prevention and control kits; Use of impermeable surfaces in workshops, and storage areas; Contaminated soil will be collected and incinerated.
Socioeconomic Issues Workers Safety—Safety hazards associated with theconstruction activity, particularly with the increase intraffic at the project site.	No specific guidelines exist. A significant impact will be interpreted if there are complaints from the community or the occurrence of any	Speed limit of 10 km/h will bemaintained on the access road; Traffic controller will be stationed on the access road; night driving will be kept to a minimum

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	injury or loss	
Project and Community Interface—Inter-cultural differences between the projectstaff from other areas and the local community	No community complaints	Training of the non-local project staff on local culture and norms; Avoidance of unnecessary interaction oflocal population with the non-local project staff

Table: Summary of Environmental impacts of the project during the operation phase and their mitigation measures:

Potential Impact	Criteria for determining Significance	Key Mitigation Measures
Dust Emissions- Particulate matter emissions during project process can deteriorate the air quality in the working area and be a nuisance for the workers' health. Gaseous emissions from site generators, boiler and transportation vehicles can result in deterioration of ambient air quality of the outdoor environment.	OSHA Standards PEQS for Ambient Air	PPEs i.e. masks will be provided toworkers during the working hours. Proper ventilation should beensured in the working area. Vehicles to use for the transportation of materials should be properly tuned. Generators should be tuned regularly and their PEQS compliance should be ensured. Venturi and wet scrubber will be installed at the stack of boiler to control the air emissions from the boiler. Monitoring should be conducted on Monthly basis as per EPA PEQS Rules.

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Machinery Noise- Working of machinery can be a nuisance forthe workers in the working area.	OSHA Standards	PPEs i.e. ear muffs should be provided to workers in case of high noise.
Health & Safety Issues- Health and Safety issues e.g. Cuts and Injuries may be caused during the machinery handling.	OSHA Standards	Proper training of the staff should be conducted to avoid the accidents. First aid measures should be provided at the workplace.
Discharge of wastewater- The discharge of untreated wastewater can be a negative impact.	PEQS for Municipal and Liquid Industrial Effluents (mg/l, unless otherwise defined)	Compliance of PEQS for Municipal and Liquid Industrial Effluents will be ensured. Monitoring will be conducted as per PEQS and reports will be submitted to EPA.
Solid waste management- Improper solid waste management may cause health problems and aesthetic issues	Exposure to potentially hazardous waste; Generation of excessive waste; Recyclable waste and reusable waste is discarded; Littering; Improper disposal.	Waste bins should be placed at suitable places. Domestic and process related waste should be handed over to contractors.
Groundwater—The increased withdrawal of groundwater for the project will affect the groundwater resources of the project area	Water extracted for theproject has directly affected the ability of thecommunity to meet their water needs	No impact on the community groundwater needs is envisaged as a result of the project.

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Proposed Environmental Monitoring

To oversee the environmental performance of the project through its lifecycle enforcing the PEQS an Environmental Monitoring Program should be formulated which ensures effective surveillance of the environmental parameters at various stages of the project development and compliances with PEQS and legal obligations. Monitoring for following Environmental Parameters is recommended:

- **Ambient Air**

Monitoring for ambient air should be conducted on quarterly basis during constructional phase of the project and report should be submitted to EPA Punjab.

- **Noise**

Regular monitoring for noise level should be maintained periodically during construction and operation phases of the project and report should be submitted to EPA Punjab.

- **Water quality**

Regular monitoring of water quality should be conducted during construction and operation phases of the project and report should be submitted to EPA Punjab. Record should be maintained regarding the underground water pump and consumption.

Recommendation: Environmental Monitoring data log book should be maintained by the project proponent

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Chapter 1: INTRODUCTION

This Section of the report provides an overview of the rational of the Project, objective of project, requirement of the project, purpose of the report and approach adopted to conduct the Environmental Impact Assessment Study.

1.1 Purpose of the report

Environmental Impact Assessment (EIA) report is being submitted to the Environmental Protection Agency (EPA), Government of the Punjab, Lahore for the compliance of Section 12 of Punjab Environment Protection Act-1997 (Amended 2012) for obtaining No Objection Certificate (NOC) for its Construction. The proponent is voluntarily filing an Environmental Impact assessment for its **Construction of a tannery unit** and keen to obtain NOC from EPA because of his commitment to environment, for the regularization of the operations and to fulfill the requirement of international clientage. The other relevant regulations and guidelines considered while preparing this EIA report include:

- Policy and procedures for filing, review and approval of environmental assessments.
- Guidelines for the preparation and review of environmental reports.
- Guidelines for public participation.
- Guidelines for sensitive and critical areas.
- Detailed sectoral guidelines Various aspects like environmental, social, physical and other aspects of the project are highlighted in this EIA report.

Measures necessary to be adopted to mitigate any environmental impacts on any part of the environment around are also described. All the important information is also provided as described under the format used to help decision makers, EPA Punjab in the present case, before issuing the desired Environmental Approval.

1.2 Identification of the project and proponent

The subject project falls under Clause 10 of category B of Schedule II of Review of IEE and EIA Regulations, 2000.

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1.2.1 Proponent:

M/S Libermann International

Proponent: Shafiq Ul Islam

Postal Address: Sialkot Tannery Zone Kuluwal Road Chowk Khambranwala, Sumbrial

Email: shahid.saleem@nizamsons.com, Irfan.Qadir@nizamalam.group

Contact: 03454599100

1.3 Details of Consultant

Asian Verification(Pvt.) Ltd is an independent company, who conducts IEE, EIA, EMP and other environmental investigations through its panel of environmental consultants, public participation practitioners and experienced environmental managers. The company has its own recommended instruments to check the baseline environmental data/PEQS and lab analysis facility for water, waste water priority parameters.

Contact: Asian Verification (Pvt.) Ltd.

Office No: 19 km Ferozepur Road, 1-km Kalam Kar Road, Lahore.

Tel: 0304-111-47-48, 03011003051

Email: *info@asianverification.com, coordinator@asianverification.com*

The details of the consultant are given below:

List of Names, Qualifications carrying out IEE/EIA

Name	Qualification	Experience
Mr. Junaid Ahmed	Textile engineering (20+ years' Experience in environmental)	Lead Consultant
Ms. Fatima Ather	MS TQM, Post Graduate Diploma in Environmental Law, BS Environmental Science	Environmentalist

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Mr. Luqman Saleem	BS (Hons). Environmental Sciences	Project Engineer
Mr. Usama Amin	BE (Environmental Engineering)	Project Engineer
Mr. Farhan Manzoor	MS Analytical Chemistry	Chemist

1.4 Brief description of Nature, Size and Location of Project

Subject project is an already established unit of Leather production under the name of M/s Libermann located at Plot 284-A, 5km Sialkot Airport road, Kuluwal road, Chowk Khambranwala, Smabrial Sialkot Tannery Zone. . Libermann International Company is a state of the art company which has been operational in Sialkot from many years but sue to shifting of tanneries into Sialkot tannery zone, the company is shifting its operations.

Raw skins of animals are being used as raw material of the project process. 50000 kg per month raw skins will be used as raw material. Chrome tanning method is being used for the production of leather. And vegetable tanning method will also be used. Finished leather is the final product of the concerned project process. Capacity of the said unit is 385000 Sqft/year finished leather. Total cost of the project is approx. 600 million PKR.

1.4.1 Location

Subject project is located at Plot 284-A, 5km Sialkot Airport road, Kuluwal road, Chowk Khambranwala, Smabrial Sialkot Tannery Zone.

Project land coordinates are as follows:

North: Location for tannery

South: Place for tannery

East: Place For Tannery

West: Place for Tannery

As its located in Sialkot tannery zone, so surrounding is all tanneries.

Google Earth Map showing the project location is attached below as **Figure-1**.

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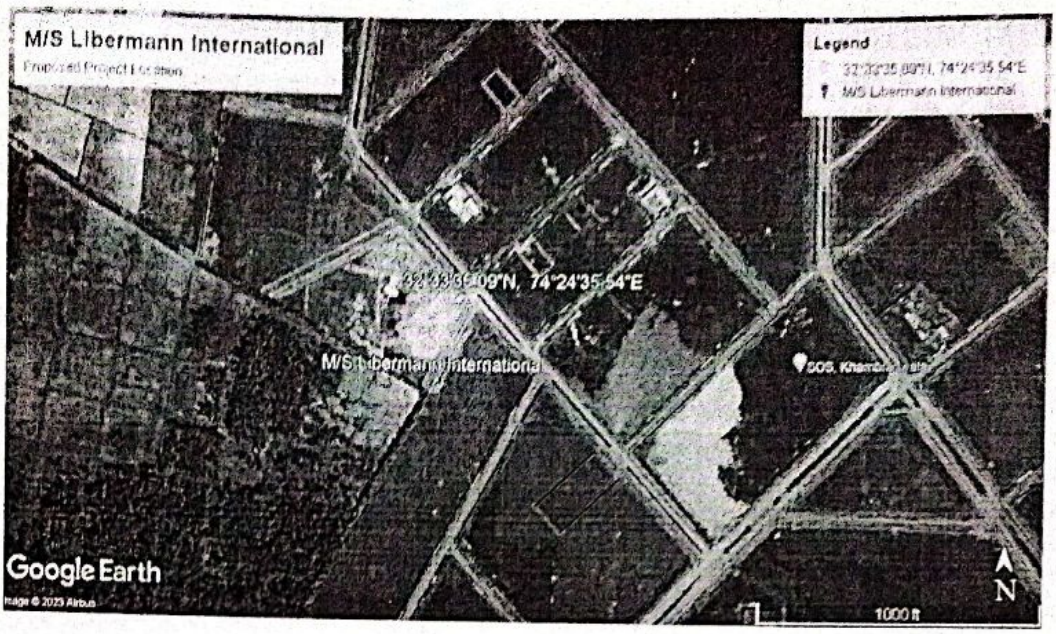


Figure 1 Proposed Project Location

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CHAPTER 2: SCREENING

According to the Section 12 of Punjab Environmental Protection Act, 1997 (amended 2012) which states;

"No proponent of a project shall commence construction or operation unless he has filed with the Government Agency designated by Federal Environmental Protection Agency or Provincial Environmental Protection Agencies, as the case may be or where the project is likely to cause an adverse environmental effects an Environmental Impact Assessment (IEE) and has obtained from the Government Agency approval in respect thereof."

According to Review of IEE and EIA Regulations, 2000; the proposed project (Construction of Leather tanning & processing unit) falls under Schedule II, Category B i.e., Manufacturing and construction. Thus, an EIA Report is being prepared for duly submission in EPA, Punjab.

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Chapter 3: Scoping

3.1 Spatial and Temporal Boundaries of Environmental Assessment

Project site is open land and present within the premises of Sialkot Tannery Zone and under the ownership of company. The main reason of shifting the tannery unit to the designated tannery zone is to keep a safe aerial distance of project site various residential and industrial facilities are existing but due to installation of current project sanitary condition of area will be improved, pollution load will be decreased, water quality will be improved, pollutants & toxicants will be eliminated that enable wastewater to reuse for horticultural and sprinkling on unpaved roads after treatment. A little bit odor issue could rose that will be controlled by adopting proper mitigation measures. Moreover, residential areas are present at safe distance from project site so they would not impact due to odor problem.

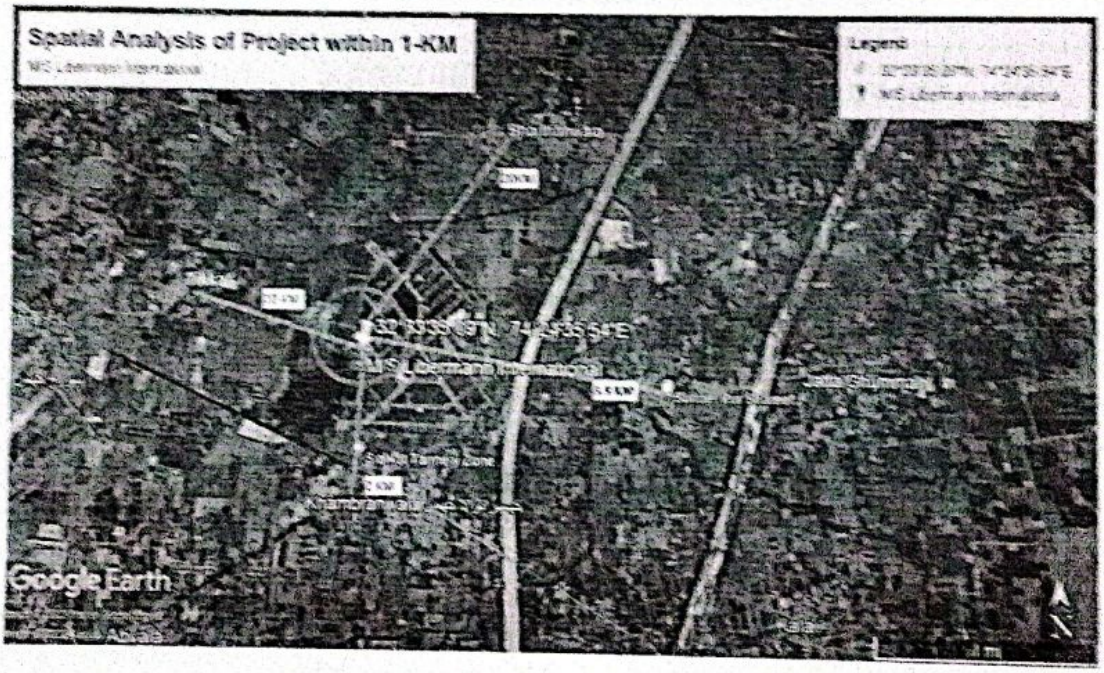


Figure 2 Receptors Within 1-KM

3.2 Important issues and concern raised during consultation

During consultation it was observed that maximum of people was in favour of project and following issues and concerns were raised.

During survey following concerns of the local community, Government Departments and Environmental Practitioners and experts were noted:

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- Nuisance must be controlled.
- Latest/State of the art technology must be adopted.
- Locals should be preferred for the job opportunities.
- Monitoring should be done regularly to check efficiency of treatment plant and to
- comply with PEQS.
- Solid waste should be managed effectively by adopting the standard practices of the area.
- Cleanliness of the area should be ensured.
- An effective EMMP should be designed and enforced with true spirit.
- Health of the workers should be ensured.
- Plantation of indigenous species must be carried out at extensive scale.
- Proper disposal of sludge should be practiced.
- Removal of shrubs and bushes should be avoided to the extent possible.

3.3 Significant impacts and factors to be determined

Main impacts and factors to be determined are:

- Occupational Health and safety.
- Site Security.
- Traffic Management.
- Hygiene management.
- Job opportunities for locals.
- Resource conservation.
- Avoid excessive water consumption.
- Energy efficient techniques must be adopted.
- Proper site restoration after construction.
- Tree plantation at designated green areas.
- Emergency preparedness.

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Chapter 4: Considerations of Alternatives

4.1 Site Alternatives, their selection and rejection criteria

For Construction of a tannery unit, it is important that industry or source of wastewater generation, and the drain must be as close as possible for safe discharge. The site selected for current project is present within the Sialkot tannery zone. Moreover, the basic infrastructure facilities, i.e. metaled road network, proximity to electric transmission system, manpower, project economic viability with reference to specific site, land use policies, further expansion possibilities, and etc. are favorable on proposed site.

The selection of the government site is final, and no alternative locations have been taken into consideration. This decision reflects a comprehensive evaluation process that has led to the determination that the chosen site aligns best with the project's goals and requirements. The government's commitment to this site underscores its suitability in terms of accessibility, infrastructure, and strategic significance. As the project moves forward, stakeholders can anticipate a focused and efficient development process, leveraging the advantages presented by the selected site.

The site is suitable for implementation of said project owning to the following characteristics:

- Transportation infrastructure(road network) is available
- Safe distance from sensitive receptors (residential area & protected area)
- The selected site is under the ownership of the proponent.
- No land use change is being foreseen due to implementation of said project.

4.2 Environmental Alternatives, their selection and rejection criteria

To fulfill the commercial aspects of the project under reference of this EIA Report, it is to be sited at a place where commercial processing activity is either already going on or there are bright prospects of the same. Concurrently, it must also meet the legal requirements of the Punjab Environmental Protection Act, 1997 (Amended 2012). Availability of land at the best convenient place is equally important among other considerations for the site selection. Availability of access roads, communication facilities, electricity, basic infrastructure, sewerage etc. is yet the other necessary requirements.

Obviously, environmentally sound, neat and clean environment are the other considerations for

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site selection. The project will also facilitate the people of the area with increasing the opportunity of employment, and other related facilities.

The industries/members shall make utmost effort to conserve resources, especially water and chemicals. The industries shall make effort to minimize the use of water and hazardous chemicals by adopting the cleaner production practices. STZ or their representative bodies shall help industries in identification of cleaner production practices and assist them in their implementation. Recognizing the limited resources for Effluent Treatment Facilities and the associated treatment costs, it is desired that the maximum utilization of water for tanning must not exceed 20-25 liter per kg of leather processing.

The designated site falls within the tannery zone, a crucial detail in its selection. The Special Tannery Zone (STZ) responsible for this decision undertook a comprehensive Environmental Impact Assessment (EIA) process (. This assessment involved a diligent examination of alternative sites to ensure a well-informed decision. Interested parties can verify this by referring to the EIA documentation. The STZ's commitment to a thorough evaluation of alternatives underscores its dedication to sustainable and responsible development practices. This approach further solidifies the suitability of the chosen site within the designated tannery zone.

4.3 Design/technology alternatives, their selection and rejection criteria

All technology design are according to the Sialkot tannery zone specific cleaner production guidelines which are as follows:

4.3.1 Abattoirs

Short-term preservation by chilling/ice cooling, i.e. processing of fresh raw hides and skins is the only efficient and, as a rule, cost-effective method to avoid a significant amount of salts entering the tanning process. Nowadays, most not only European but also Brazilian hides are processed green, i.e. without salting. Therefore, appreciating the complexity and scale of problems involved, it is recommended to allocate and reserve the space witin or near to the STZ for setting up a slaughterhouse together with chilling facilities. Significant number of goats and bovine animals are slaughtered in the Sialkot region its operation should be economically viable. Furthermore, there would many favorable direct and synergistic effects such as:

• A significant part of daily tannery input (soak) would be salt-free, the problem of TDS not so pronounced; • Upgrading of the overall hygienic conditions, including quality and safety of meat produced

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• Improved flaying (machine flaying) would drastically improve the quality/grading/value of both hides and skins;

• Fleshing (green fleshing) combined with proper trimming within the slaughterhouse facilities would increase the amount of non-tanned solid waste to be converted into valuable by-products at industrial scale processed in the STZ.

The area and supporting infrastructure requirements (water, power, pre-treatment facilities) should be defined in consultations with appropriate specialists. Recent examples of processing fresh hides in similar climatic conditions (Kanpur/India), provides an opportunity to replicate same approach.

4.3.2 Tannery in-plant general

4.3.2.1 Strict water management system

The very first goal should be to change the prevailing attitude among tanners of Sialkot that water is almost a freely available commodity; instead, it should be understood that water is both a valuable resource and a chemical like any other to be paid for. In practical terms, it means that it is necessary to adopt the following measures:

• Ensure that water at STZ is supplied to individual plants only from a centralized, controlled system at reasonable price charged per m3 of water consumed; the price should be sufficient to meet the cost of appropriate maintenance of the water piping.

• In addition to the main water meter at the supply point, to have water meters installed at each main branch within the factory, i.e. separately for the beamhouse, tanyard, wet finishing, dry finishing, sanitary facilities etc. Experience has shown that that is the only way to secure accurate picture of the real and not "recipe based" consumption.

• Use of hot/cold water measuring and mixing system (Aquamix type) for all drums should be a standard for all tanneries at STZ.

• The practice of rinsing by continuous flow should be replaced by batch rinsing. It is very difficult to estimate the rate of water consumption decrease from the present level (some 40– 80 m3 /t) as well as the level at which it will stabilize for a longer time span. However, based on experience in similar cases elsewhere, taking account that skin processing usually needs more water etc. the volume of 20-25 m3 /t may be not too off the mark and could possibly be used for designing the CETP.

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4.3.3 Float recycling

Float recycling is recommended to reduce water consumption and/or improve the uptake of chemicals offered and thus the resulting hydraulic and pollution load; important precondition is that process parameters and consistence of leather quality are not affected. In practice, most frequently recycled floats are the second soak, lime liquors but mainly it is pickle and spent tanning floats. In any case tanners should go for modern drums, drive gears and auxiliary equipment allowing work with short floats, fast and uniform distribution of chemicals added, recycling and easy segregation of floats. Liming drums and paddles should be equipped with hair screening and dewatering devices making it possible to have efficient hair-save deliming and handling of recovered hair. The power lines need to be of appropriate (higher than conventional) capacity, the tannery space and layout sufficient to accommodate such equipment, including gullies and tanks.

4.3.4 Segregation of all chrome-bearing

streams In order to keep the chrome content in the sludge at the lowest possible level and thus increase the scope for its utilization, it is an absolute must to ensure that all chrome bearing liquids are kept from mixing with other streams. The share of chrome oxide discharged in effluent is illustrated in Figure:

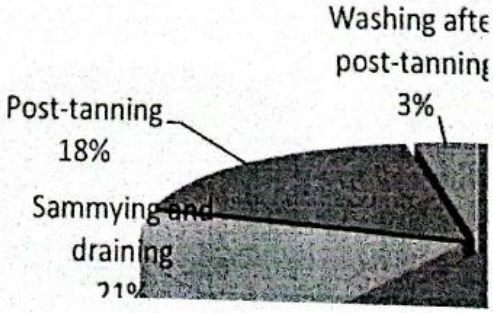


Figure 3 The share (%) of chrome oxide discharged into effluent

It means that not only spent float from the main tanning but also from chrome retaining and sammying are collected and chrome eventually precipitated and removed. This has to be carried out regardless of which particular chrome management system is in place in the tannery. From the chart above, it is clear, that main source of chrome in waste water/effluents, is from post tanning and sammying (provided that CRP system is in place). This chromium contaminates sludge from the process and increase required costs for sludge disposal. It means that not only spent float from

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the main tanning but also from chrome retanning and sammying are collected and chrome eventually precipitated and removed. This has to be carried out regardless of which particular chrome management system is in place in the tannery. From the chart above, it is clear, that main source of chrome in waste water/effluents, is from post tanning and sammying (provided that CRP system is in place). This chromium contaminates sludge from the process and increase required costs for sludge disposal.

4.3.5 Segregation of various types of solid wastes

Normally each tonne of wet salted hides generates not less than half a tonne of different wastes of varying water content: fresh trimmings, fleshings, unusable splits, shavings, buffing dust, crust and finished leather trimmings. To facilitate more efficient handling/collection, (re)utilization and quality of by-products made of them, as well to maintain good hygienic conditions in the factory, it is essential to keep each type of waste separately. Overview of possible utilization of different solid waste fractions: The tanning industry is often described as the backbone of the leather industry. It also provides an environmental service for the much larger meat industry as the hides and skins are but by-products of the meat processing industry. In the processing of hides and skins into leather something similar happens. Tanners' interest lies with the corium or collagen, which represents only about 280 kg out of 1,000 kg of raw hide while all other elements.

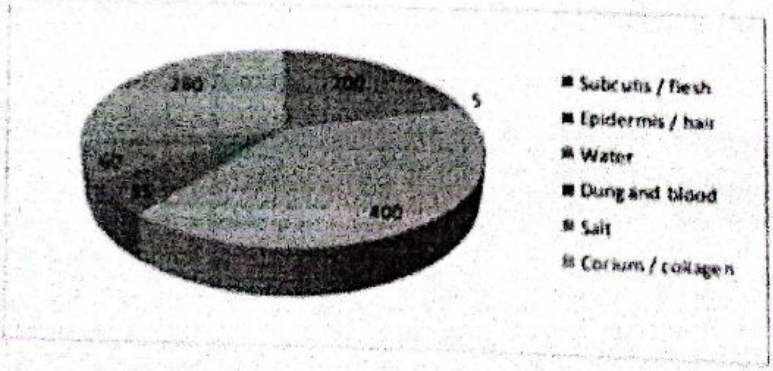


Figure 4 Main components of a raw hide or skin prior to processing in a tannery.

The main sources of solid wastes in tanneries originate from trimming and fleshing of raw hides and skins as well as splitting and shaving of tanned hides and skins material. A further important source of solid waste is the sludge from effluent treatment. However, many of these wastes may be classified as by-products as they may be sold as raw materials to other industry sectors.

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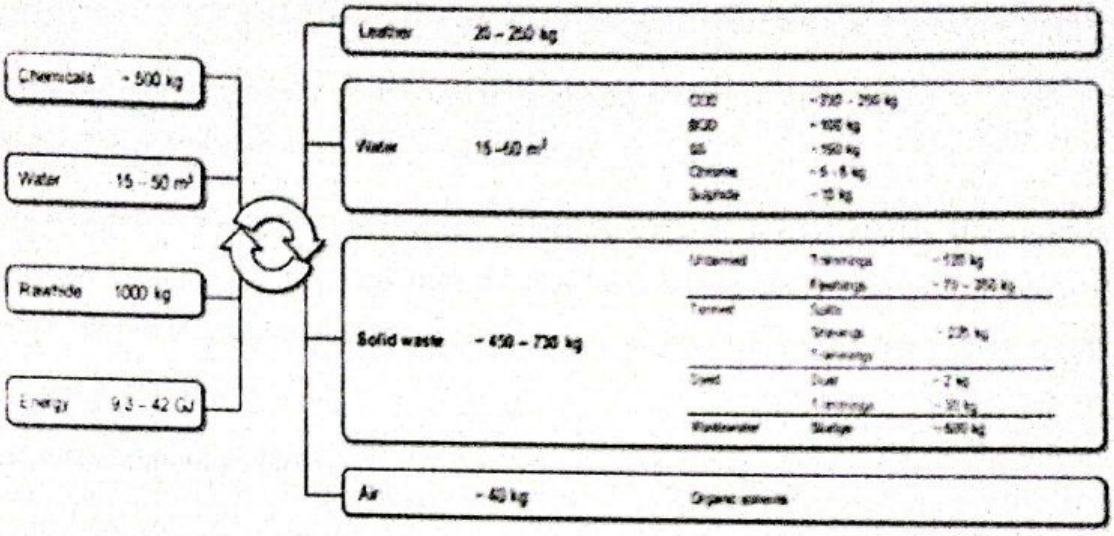
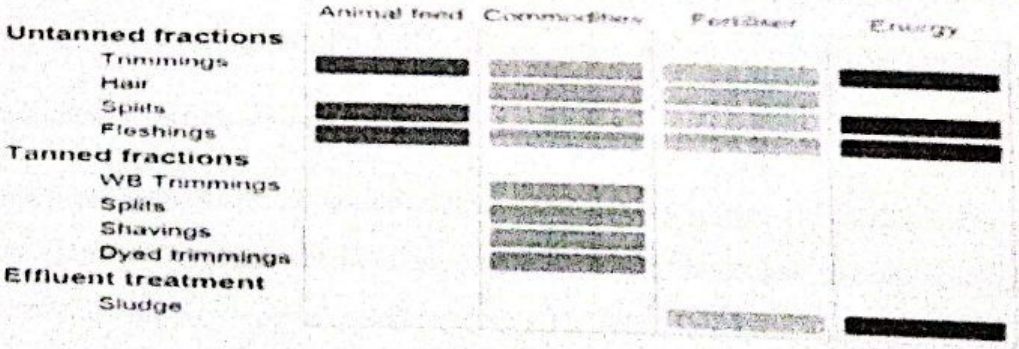


Figure 5 Input / output overview for a chrome-tanning process for bovine salted hides2

It provides an overview of the typical input / output quantities of material for a conventional (chrome-tanning) process for bovine salted hides per tonne of raw hide treated taken from the IPPC's BREF document for tanning of hides and skins (2003). However, it has to be emphasised that the figures strongly depend on the raw material processed, the required quality and specifications of the final product, the processes chosen and local capabilities and requirements.



For utilization of different fraction it is recommended to prepare detailed feasibility studies based on the volume of waste.

4.3.6 Avoidance and monitoring of banned and/or potentially harmful substances

In the past few years, buyers of leather and leather products from many industrialized countries prescribe very strict leather specifications; the content of some substances considered potentially

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harmful to human beings is severely restricted or banned. Though the impetus for such specifications mainly emanates from Germany, other European Union (E.U.) members follow suit even while some of these specifications may be considered far-fetched and scientifically not well founded. Currently customers' specifications increasingly insist on either absolute absence (i.e. below detectable limits) or extremely strict limits for:

♣ **Pentachlorophenol (PCP)** This chemical, formerly used as a very reliable preservative, is classified as toxic for skin and very toxic by inhalation. During combustion of PCP containing materials, dioxins may be formed. PCP is neither manufactured nor sold by reputable suppliers to the tanning industry.

♣ **Hexavalent chromium (Cr^{6+})**

Potentially carcinogenic mostly for lung and nose through inhalation of dust containing this metal. However, due to the fact that it is very seldom found in leather and since the process conditions drastically reducing the likelihood of formation of hexavalent chromium have been identified, the issue of its presence in leather might not be a serious issue anymore.

♣ **Free formaldehyde**

Classified as toxic for human beings by inhalation, mostly for children during the growing stage. It has been a favored fixation auxiliary in leather finishing but is also a component of some synthetic resins used for retanning. Tanners find it difficult to part with this easy to use, cheap fixation agent.

♣ **Forbidden aromatic amines**

Some aromatic amines resulting from cleavage of certain azo-dyes are considered or suspected to be carcinogenic. Procurement from reputable suppliers, who have discontinued production of suspected dyestuffs, is normally sufficient to avoid difficulties with forbidden amines in Europe. substances considered to negatively affect the endocrine glands are increasingly coming into focus.

Among them are alkyl/phenol etoxylates (a group of detergents used extensively in tanning industry) but reportedly also some organophosphates and synthetic pyrethroid insecticides. Purchase of chemicals from reliable suppliers should be adequate safeguard in this respect too. Monitoring and enforcement of avoidance/absence of explicitly banned chemicals is in common

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interest of all leather and leather products manufacturers: positive tests of a very few tanners can badly affect the reputation and shake confidence in entire cluster.

4.3.7 Tannery in-plant, specific processing stages

4.3.7.1 Desalting of wet salted hides and skins

In recent years, mainly in arid regions and/or with large tannery clusters without the benefit of joint treatment with large volumes of sanitary waste wasters, a very challenging issue on how to deal with the problem of TDS has come into focus of environmental authorities. TDS mainly consist of chlorides and sulphates; the former emanate primarily from ordinary salt used for preservation of raw hides and skins and from deliming and pickling stages of leather processing, the latter from chrome tanning salts. Typically, the amount of salts applied during these steps exceeds half of the weight of the raw material. In other words, for each tonne of raw hide/skin more than half a tonne of salts is applied, the major part of it ending in the effluent, mainly during soaking but also deliming, pickling and tanning stages. The ultimate consequence of use of salts in preservation and leather processing is salinity of tannery wastewaters: normally, the TDS (i.e. a parameter indicating the salinity level), of the composite effluent, depending on water consumption, is more than 10,000 mg/l. While the initial TDS remains unaffected by the usual treatment, desalination – reverse osmosis (RO) of treated effluents is prohibitively expensive. Thus, due to the TDS content, even the fully treated effluent (i.e. following the physicalchemical, biological and tertiary treatment) is unfit for irrigation and livestock watering unless diluted in large water bodies.

- **Mechanical: perforated drum**

The quantity of salt removed is about 5-6% on the weight of raw stock. In other words, about 15% of salt from curing retained by hides can be removed and recovered by this method. The method is appropriate for large hides or a large quantity of skins.

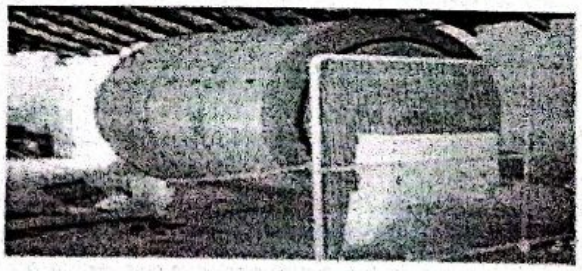


Figure 6 Mechanical Desalting Drum

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- **Mechanical: brush-type desalting machine**

A brush-type-desalting machine is fitted with a cylindrical roller embedded with hard nylon bristles in a helical pattern (see illustration below), available in different working widths, capacity about 100 wet salted bovine hides/hour; very cheap.

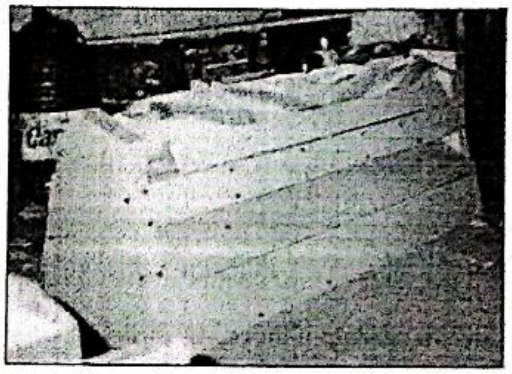


Figure 7 Brush Type Desalting Machine

- **Manual desalting: DODECA wooden frame**

Raw stock is beaten three times on a wooden stool with a dome-like top frame. Four workers are needed to desalt hides; two suffice for smaller hides and skins. It takes about 2 hours to desalt one tonne of raw stock. While the quantity of salt removed varies with the method of desalting, it is generally in the range of 4- 8% on the weight of raw stock taken for desalting.

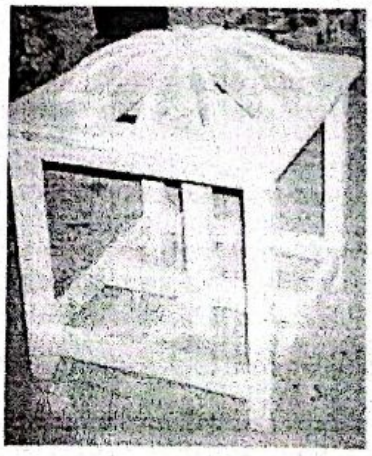


Figure 8 Dome type DODECA Wooden Frame

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Though the dusted salt from desalting operations contains many impurities, a fairly clear salt solution can be obtained by dissolving the salt recovered in water, simply screening it and then clarifying it using poly-aluminium chloride. Demonstrations showed that the salt solution so obtained could be safely used in pickling operations. Desalting of raw stock reduces the TDS level in the composite tannery wastewater by about 15%; it has been established that TDS in the composite effluent of a tannery processing salted raw hides/skins to semi-finished leather it is reduced from 12,000-18,000 mg/l to 10,500-15,700 mg/l on account of desalting of raw stock.

4.3.7.2 Hair-save unhairing

For more than a century, hair-destroying unhairing process using lime and sulphide has been practiced in most countries. Since it renders mechanical unhairing superfluous, it saves both labour and time. It also ensures a clean pelt and opens up the hide substance to a satisfactory degree. However, dissolving the hair results in high organic pollution in the wastewater, expensive biological treatment and high sludge volume.

For these reasons, hair-save unhairing has become a well-established practice, especially in industrialized countries; also, very often, without hair-save unhairing it is impossible to meet stringent nitrogen discharge norms. There is a wide range of hair-save unhairing methods, the prevailing include lime-sulphideunhairing, variations of the Sirolime process, Blair-Hair method, unhairing with organic sulphur compounds (three basic types appearing under various commercial names), enzyme or enzyme assisted conventional unhairing, lyotropicunhairing/sweating (mainly for wool sheepskins) and painting. Painting is a traditional hair-save method for calf, sheep or longhaired goat skins. It is used in cases where the hair/wool is valuable. The skins are painted (by hand or on a machine) on the flesh side with a paste consisting of sodium sulphide, lime or china clay or organic thickeners and water. Normally, the paste contains 5-15% sodium sulphide and 40-70% water, with a density of 15-400Bé. After painting, the skins are stacked in a pile, hair side against hair side. The unhairing chemicals penetrate the skin from the flesh side and destroy the hair roots so that the hair can be scud off easily. The hair is practically intact except for the hair root end. Mechanical or manual unhairing and re-liming are necessary. The hair must be dewatered as swiftly as possible, for example, by means of a screw press or by draining it in a perforated container. Failure to act swiftly results in very rapid putrefaction of the proteinaceous matter in the water adhering to the hair. The hair generated represents another category of solid

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waste; fortunately, nowadays there are already viable options for its reutilization and disposal. For STZ it is recommended to make hair-save unhairing. The tanners must decide for themselves based on cost-benefit analysis which hair-save method to adopt. It seems that for goat and sheepskins painting (by hand or machine) with subsequent re-liming in drum or paddle might be the most suitable. In order to motivate industry to use hair-saving methods, tanneries using hair saving methods, should have lower charge for effluent treatment.

4.3.7.3 Splitting of limed pelts (ex-lime splitting)

It is a very efficient method for reducing the amount of tanned, difficult to reutilise solid waste, specifically shavings and waste splits; it also results in lower consumption of chemicals. Earlier criticism about inaccuracy is not valid anymore, there are splitters giving satisfactory results. The method is suitable for buffalo and heavier cow hides.

4.3.7.4 Ammonium salts-free deliming

Considerable decrease of not only the TDS-salinity but also nitrogen load in effluents can be achieved by introducing ammonium salts-free deliming. Organic acids are well known but costlier substitute. Carbon dioxide (CO_2) has also been widely accepted for skins and light hides, the cost varying considerably from one country to another. Depending on the availability and cost of carbon dioxide in Urdudesh as well as characteristics of local raw material, it would be worth considering making ammonium salts-free deliming.

4.3.7.5 Full scale chrome management

Chrome uptake in the conventional process is of the order of 60-80% of the offer; the rest ends up in the effluent. However, by optimizingthe main process parameters i.e. mechanical action, chrome concentration, chrome offer, pH, temperature and reaction time, the chrome uptake even in the traditional process can be significantly increased. Nevertheless, modification of the conventional tanning process is the only way to meet the high demands of modern chrome management and, in particular, to bring down the sludge chrome content. In practice, three principal approaches to maximizing chrome utilization in tanning processes have been developed.

- **High chrome exhaustion**

High chrome exhaustion methods normally involve:

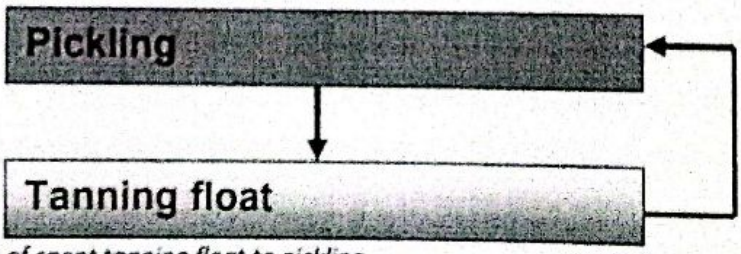
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(i) Masking the chrome tanning complex. It is usually with dicarboxylic acids which reduce affinity to the collagen and thus improve chrome penetration and chrome distribution over the crosssection is more uniform. Also, there are other tanning auxiliaries available on the market, usually based on some cross-linking function (e.g. aliphatic dicarboxylates, low molecular weight polyacrylates and syntans); they may be applied at the start of the tanning process or even form a part of the basification system.

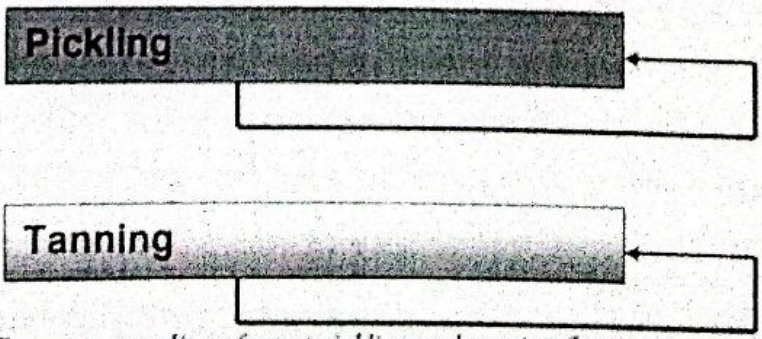
(ii) Increasing the collagen reactivity. The main way of increasing collagen reactivity is to increase the number of carboxyl groups on the amino acid side chains in order to provide more sites for cross linking. The chrome offered is thus exhausted more effectively and fixed more firmly than in conventional tanning. Commercially available tanning auxiliaries are mostly based on glyoxylic acid. In practice, all high exhaustion variations are dependent on costly, proprietary specialty chemicals.

- **Direct recycling of tanning floats**

There are many variations of this method, the simplest are shown graphically:



(i) Recycling of spent tanning float to pickling



(ii) Separate recycling of spent pickling and tanning floats

Figure 3.6

- **Chrome recovery/reuse after precipitation and redissolving**

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Recovering chrome from spent tanning floats after precipitation constitutes an indirect means of recycling and reusing the chrome in processing. In practice, two methods are in use.

(i) Rapid precipitation with sodium hydroxide or sodium carbonate, enhancing coagulation with polyelectrolyte, thereafter thickening and dewatering the voluminous sludge by filtration.

(ii) Slow precipitation with magnesium oxide, settling of the suspension, decantation of th supernatant (no need for a filter press) and subsequent acidification of the relatively dense precipitate.

There is a wide consensus that for less demanding purposes, tanning with 70% fresh chrome and 30% recovered chrome is acceptable. However, for high quality and leathers in light colours, only fresh chrome has to be taken. The tannery itself has to devise an optimal technology for applying the chrome liquor recovered. For example, if the tanning of grain leather is carried out using chrome powder, the chrome liquor recovered can be used for split tanning. The choice between high-exhaustion tanning, direct float recycling and indirect recovery/reuse depends on individual conditions in the tannery concerned. No explicit recommendation can be made as to the optimum way of reusing the chrome and reducing it to a minimal level in the wastewater stream. One could expect that larger scale, advanced tanneries will set up their own chrome management system adopting one or a combination of the alternatives available; a common chrome recovery/redissolving system may be the optimum solution for a group of small-scale tanneries.

4.3.7.6 Low-energy drying

The inner/clear height of dry departments of tannery buildings has to be sufficient to allow for installation of overhead conveyers for drying. In addition to reducing the drying costs, that will also contribute to better working conditions and, as a corollary, well-known benefits derived from observing the OSH standards. In order to take advantage of climatic conditions it would be also worth evaluating the scope of using solar energy to support drying at various stages of leather manufacture.

4.3.7.7. Environmentally friendly finishing

To conform to existing and/or future norms concerning volatile organic carbon (VOC) emissions3 emanating from leather finishing, water based coating/finishing formulations should be used.

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Organic solvents based finishing to be applied only for high performance leathers and using appropriate coating and scrubbing equipment. Similarly, in view health hazards associated with formaldehyde, including norms pertaining to its presence in leather, fixation with formaldehyde and other banned agents should be abandoned. Hand-spray drying is to be limited to testing and/or sample making purposes whereas rotary sprayers should be used mainly for very soft and/or special types of leather; otherwise, preference to be given to roller-coating machines.

4.3.7.8 Expected impact of cleaner processing methods

Practical experience has shown that by using salt-free preserved raw hides and skins and adopting cleaner leather processing methods proven at industrial scale, specific pollution loads discharged in effluent can be reduced in comparison with the conventional process up to approximately:

	%
Suspended Solids, SS	50-60
Chemical Oxygen Demand, COD	30-40
Biochemical Oxygen Demand, BOD5	30-40
Sulphides, S2-	85-90
Ammoniacal Nitrogen, NH3-N	80-85
Chromium, Cr	90-95
Chlorides, Cl-	70-75
Sulphates, (SO4)2-	60-65

In other words, the currently available cleaner tanning technology methods can reduce the pollution load but the need for end-of-pipe treatment remains. The main expected favorable impact of cleaner technologies proposed for STZ are lower overall pollution and hydraulic load and, accordingly, lower CETP investment and operation costs. In particular, cleaner technologies should result in:

- Lower water consumption – better preservation of rapidly diminishing water resources
- Lower TDS content/salinity – lower risk of affecting the usability of the receiving river water for irrigation and livestock watering;

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- Proportionally higher volume of solid wastes suitable for processing into saleable by-products;
- Lower BOD5, COD and Nitrogen content within acceptable range – protection of aquatic life, avoidance of eutrophication;
- Low level of chromium in part of CETP sludge – the scope for land application and/or composting.

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Chapter 5: Description of the Project

General

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

5.1 Project Objectives

The overall aim of proposed project is to reduce the pollution load and protect the environment by adopting water conservation measures. After treatment water can be reused in process, horticultural activities and water sprinkling at un-paved roads. Moreover, Project objectives are as follows;

The main project objectives are as follows:

- Construct an environmentally compliant and resource-efficient tannery.
- Efficiently manage resources like water and energy.
- Implement proper waste management to minimize environmental impacts.
- Generate local employment while ensuring safety and health.
- Contribute to the tannery sector's growth with minimal negative effects.

5.2 Location and Site layout of Project:

The location of the said project is M/s Libermann International at Plot 284-A, 5km Sialkot Airport road, Kuluwal road, Chowk Khambranwala, Smabrial Sialkot Tannery Zone. Coordinates of the site are Latitude 32°33'35.0"N and Longitude 74°24'37.1"E. However, the Google Earth Map showing the project location and its distance from nearby sensitive receptors is attached below:

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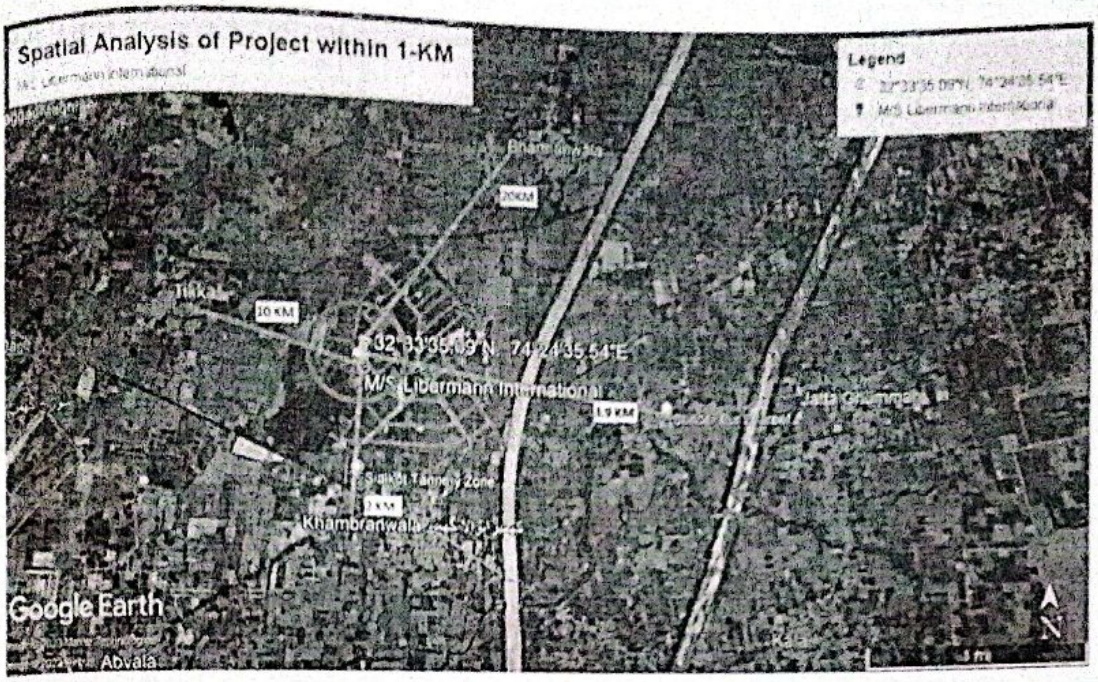


Figure 9 Distance of Proposed Site From nearby residential area

5.3 Land Use On-Site

The proposed site is open land and present within the premises of Sialkot Tannery Zone.

Pictorial evidence is given below as:

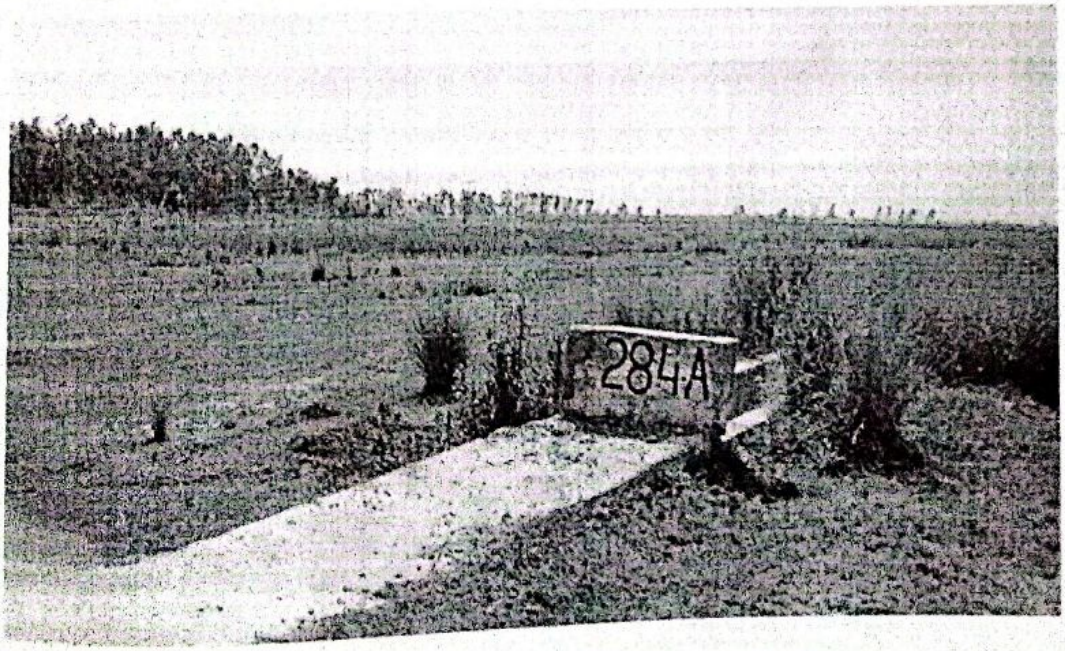


Figure 10 Site Selected For Proposed Construction

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5.4 Road Access

The site is approachable via Sialkot Airport Road and Chhanni Gondal Road as show below:

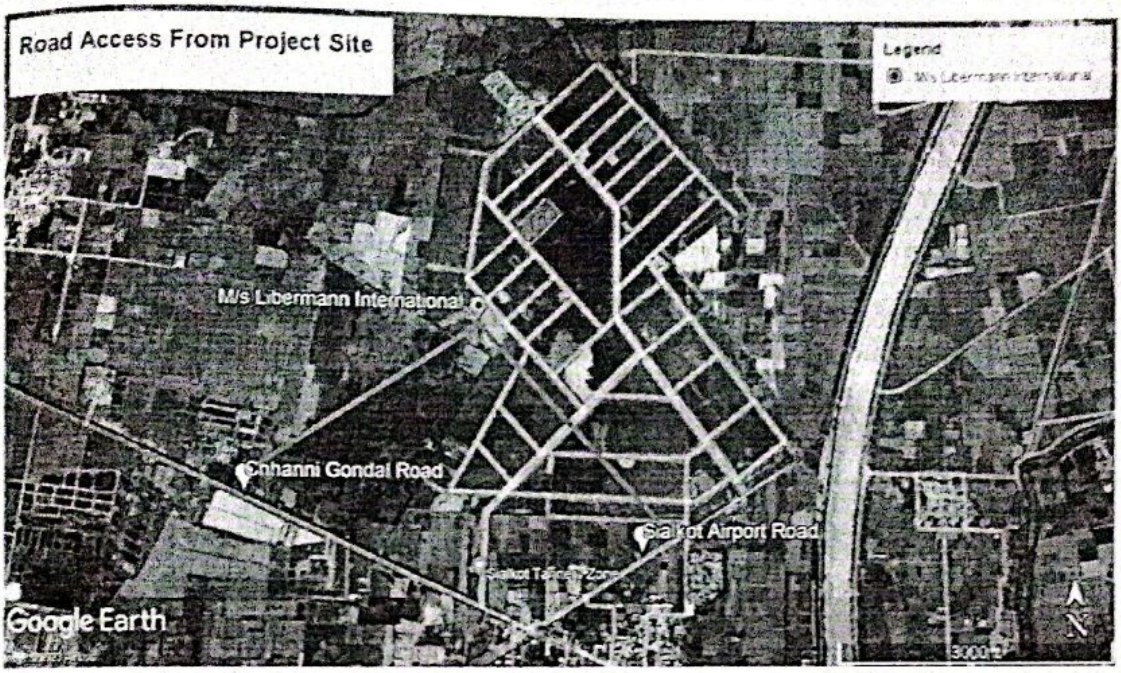


Figure 11 Road Access Map

5.5 Vegetation Features

The topography of the project area is flat and it is barren open land with few herbs & shrubs species that will be removed for installation of proposed project. 20% of the uncovered area within the industries must be used for tree plantation/vegetation by the allotees. The members must plant at least four (04) trees per Kanal land owned. However, tree plantation on the area outside boundary of the industries is the responsibility of STZ or party selected by STZ.

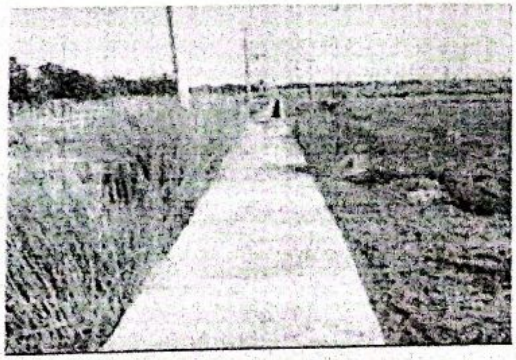


Figure 12 Vegetation Feature on-site

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5.6 Operational Process Flow chart

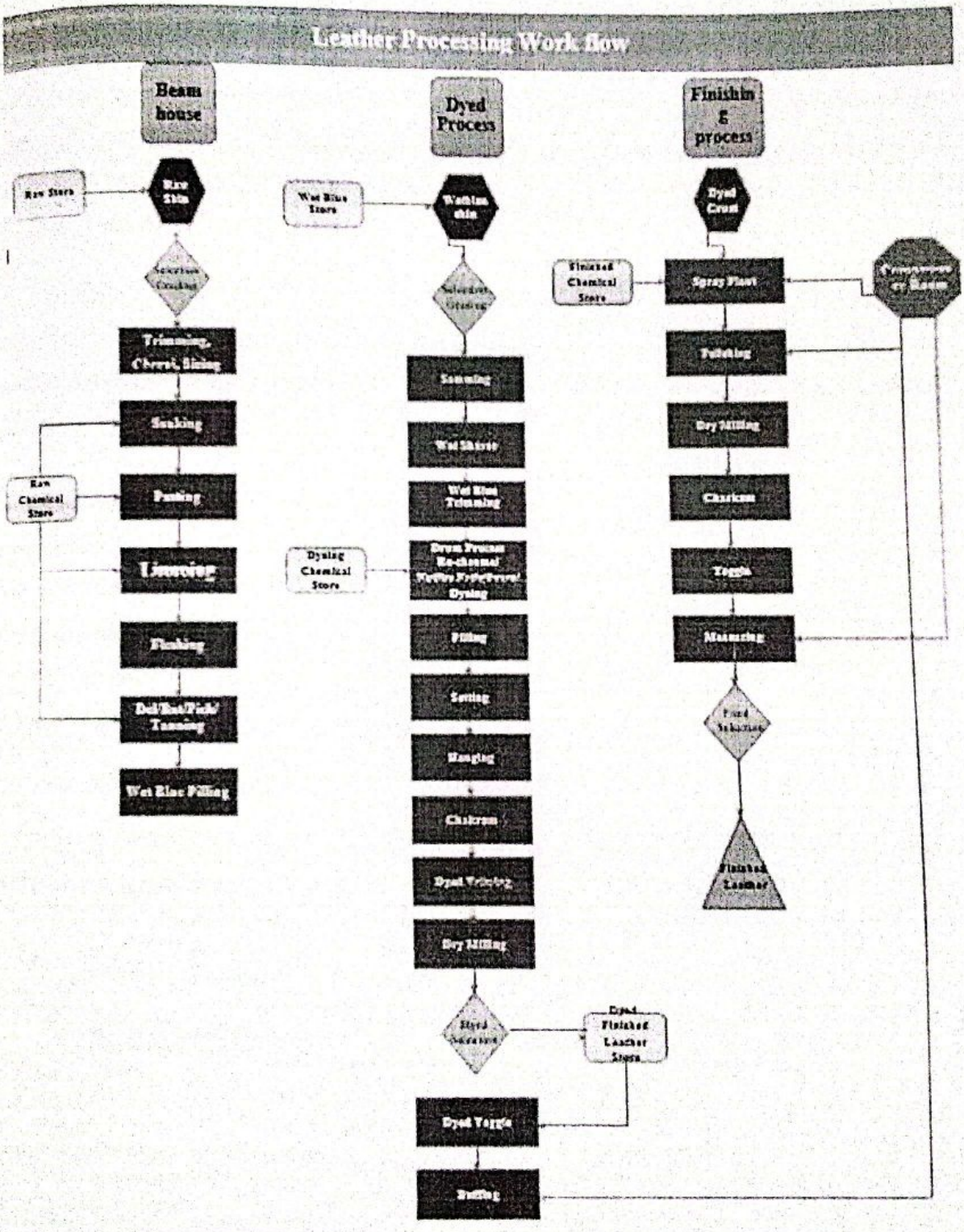


Figure 13 Project Process Flow Chart

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5.7 Process Description

- **Trimming**

At first raw hides/skins are selected and the putrefied stock put aside to treat separately. Trimming process is a manual operation. In trimming unnecessary part of the hides or skins are trimmed. After then weight of the hide is measured because chemicals are used till fleshing on the basis of the weight of hide.

- **Main-Soaking:**

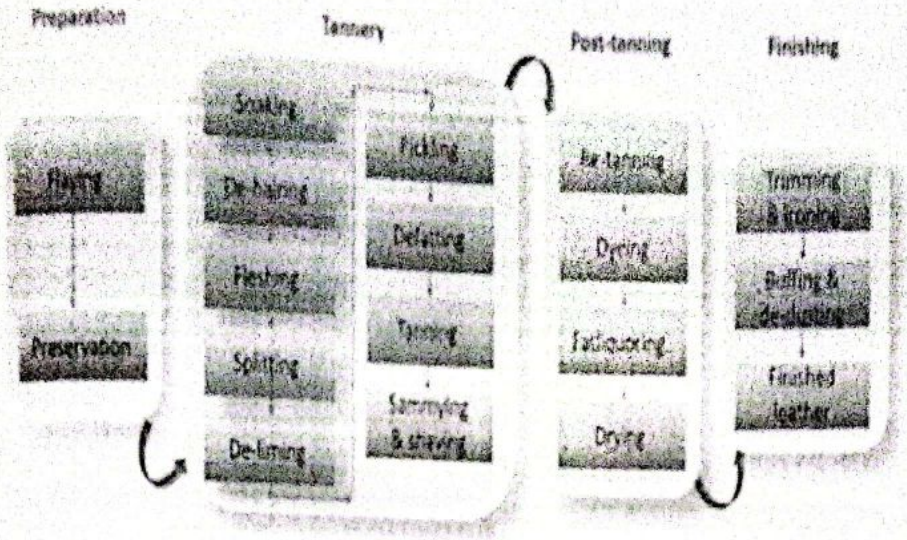
In soaking water for purposes of washing or rehydration is reintroduced. In soaking, the hides are soaked in clean water to remove the salt left over from curing and increase the moisture so that the hide or skin can be further treated. 150% float of salt and water is used in soaking.

- **Liming:**

Liming is the treatment of soaked hides with milk of lime (CaO) with addition of H_2S to remove the hair from the grain surface of the hide. After soaking, the hides and skins are taken for liming: treatment with milk of lime CaO (a basic agent) that may involve the addition of "sharpening agents" (disulfide reducing agents) such as sodium sulfide, cyanides, amines, etc. The objectives of this operation are mainly to:

  - Remove the hair and other keratinous matter
  - Remove some of the interfibrillary soluble proteins such as mucins
  - Swell up and split up the fibers to the desired extent
  - Remove the natural grease and fats to some extent
  - Bring the collagen in the hide to a proper condition for satisfactory tonnage.

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- **Fleshing:**

In subcutaneous material is removed from the hides. The process of fleshing is manual. After fleshing the hides are washed in 200% float.

- **Deliming and Bating:**

The pH of the collagen is brought down to a lower level so the enzymes may act on it, in a process known as deliming. Depending on the end use of the leather, hides may be treated with enzymes to soften them, a process called bating. In bating proteolytic proteins are introduced to the skin to remove further proteins and to assist with softening of the pelt. In modern tanning, these enzymes are purified agents, and the process no longer requires bacterial fermentation (as from dung-water soaking) to produce the

- **Pickling:**

Once bating is complete, the hides and skins are treated first with common salt (sodium chloride) and then with sulfuric acid, in case a mineral tanning is to be done. This is done to bring down the pH of collagen to a very low level so as to facilitate the penetration of mineral tanning agent into the substance. This process is known as pickling. The salt penetrates the hide twice as fast as the acid and checks the ill effect of sudden drop of pH. Pickling is normally done to help with the penetration of certain tanning agents, e.g., chromium (and other metals), aldehydic and some polymeric tanning agents

- **Tanning:**

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the tanning is the process performed in a drum which makes the skin rot-proof, wear-resistant, water proof and permeable to air and steam. This last feature makes the leather breathable thanks to its porosity, making it a hygienic and precious material. The result of this process is wet skins with a light blue color called Wet Blue. The pH must be very acidic when the chromium is introduced to ensure that the chromium complexes are small enough to fit in between the fibers and residues of the collagen.

- **Basification:**

Once the desired level of penetration of chrome into the substance is achieved, the pH of the material is raised again to facilitate the process. This step is known as basification. In the raw state, chrome-tanned skins are greyish-blue, so are referred to as wet blue.

- **Wet-blue storage:**

The wet-blue hides are then packed and stored in the unit for sale to other leather processing and leather products manufacturing companies. The unit under consideration of this EIA study is meant for wet-blue production only further processing of the leather is not done in the unit.

Tannery in-plant, general:

- Strict water management system (Mandatory)
- Float recycling
- Segregation of all chrome-bearing streams (Mandatory)
- Segregation of various types of solid wastes (Mandatory)
- Avoidance and monitoring of banned and/or potentially harmful substances

(PCP, hexavalent chrome, free formaldehyde, forbidden dyestuffs/amines and surfactants.) (Mandatory)

Tannery in-plant, specific processing stages:

- Desalting of wet salted hides and skins (Mandatory)
- Hair-save unhairing
- Splitting of limed pelts (ex-lime splitting)
- Ammonium salts- free deliming

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- Splitting of limed pelts (ex-lime splitting

- Full scale chrome management (high exhaustion or direct recycling or chrome recovery) (Mandatory)

- Segregation of chrome and chrome free liquors to reduce sludge with Cr content

- Low-energy drying

- Environmentally friendly finishing.

5.8 Water requirements:

In operational phase approximately 150,000 ltr per day of water is used per day for production of wet-blue and domestic uses.

5.8.1 Waste water treatment:

A combined effluent treatment plant will be installed by Sialkot tannery zone with the capacity:

Waste water generation:

8 – 10,000m3/day = 2,400,000 – 3,000,000 m3/year (calculated 300 working days)

Chemicals to be added in waste water treatment:

Co(OH)2 (Lime) @ 0.20 kg/m3

Al2(SO4)3.14H2O @ 0.40 kg/m3

Anionic Polyelectrolyte @ 0.0025 kg/m3

Sludge production

Primary sludge

TSS 2500 x 0.80(removed) = (2kg/m3x 2,400,000m3/year)/1,000 = 4,800 tonne (100% dry solids)

Sludge with approx.. 35% dry matter ~15,000 Tonnes/year

In case chrome free effluents segregated

Sludge chrome free 35% dry matter ~7,500 tonnes/year

Sludge with chrome 35% dry matter ~7,500 tonnes/year

Chemical sludge

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Biological sludge (based on waste water /yr)

BOD removed in primary clarifier =0.45 x 2,000 = 900g/m3

BOD to Aeration =2,000 – 900 = 1,100 g/m3

BOD in effluent4 = 150g/m3

BOD degradation in Aeration tank = 1,100 – 150 = (0.95kg/m3

x2,400,000)/1,000=2,280t/year (100 dry matter)

Secondary sludge production = 0.60 x 2,280 t/yr = 1,368 t/yr (100% dry matter) = ~3,900 t/yr

(35% dry matter)

Total sludge (primary + secondary) = 18,900 t/yr

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Chapter 6: Description Of the Environment

6.1 PHYSICAL ENVIRONMENT

Description of the physical environment of the project area includes topography, geology, soil conditions, seismology, climate, surface and ground water resources. The primary and secondary data were collected from the field and the concerned departments in the city of Sialkot.

6.1.1 Topography

The area around the project site is flat. The surface is 215 meters above the mean sea level. The gradient range is 20 - 40 cm per km. Slope of the land is towards east of the project site, allowing storm and sewerage water of the area to flow in that direction.

6.1.2 Top Soil and Geology

Topsoil of the project area is of water logged and generally not suitable for agriculture. The area around has different industries including Textile, Chemical, Leather Units. The area is of Chung Formation, which is loess clay with silty and sandy deposits. It comprises earthy brown to brown silt, clay and sand. The silt beds are largely hard, laminated and sandy with interbeds of clay and layers or lenses of sand.

6.1.3 Seismology

Pakistan lies on an active seismic belt of the earth. Seismic observations indicate that hundreds of shocks originate every year. Mostly, these seismic waves are of low intensity and do not have any significant effect. According to seismic zones of Pakistan developed by Geophysical Center Quetta, the project area falls under the damage category, minor to negligible, and seismic factor is g/15 - g/20 or less.

6.1.4 Climate

a. Temperature

The climate of the city of Sialkot is sub-tropical. It is generally hot in summer and moderate in winter. Generally days are sunny in the summer months. The coldest month is January and the hottest is June. After June, the heat is somewhat temperate due to monsoon rains but humidity

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increases and the combination causes great discomfort to the inhabitants. Temperature below freezing point (32 °F) and over (115 °F) are rarely experienced. The seasonal mean monthly minimum and maximum temperatures during the year 2022 are shown in Table.

Season	Months	Temperature (°C)	
		Minimum	Maximum
Summer	May – Aug	27	45
Autumn	Sep – Nov	20	32
Winter	Dec – Feb	10	21
Spring	Mar – Apr	21	34

Source: Meteorological Department Lahore,

b. Rainfall

Sialkot lies in a relatively arid zone experiencing 300 mm - 500 mm of rain annually. Heaviest rainfall takes place during July, August and early September (cumulatively 65 per cent of the total) due to Monsoon. October and November are the dry months. April and May receive rainfall through the western disturbances or locally generated thunderstorms. During the year 2017, the maximum rainfall was in the month of July (170 mm), but the total rainfall during the peak months of June till August was 420 mm (70 per cent), out of yearly total 600 mm. The heaviest rainfall in Lahore occurred in the year 1882 when 95.07 cm of rainfall was recorded. The driest year was 1899 with only 15.77 cm of rainfall.

c. Humidity

Generally, the periods of humidity are December to February and July to September. April and May are dry months. The seasonal mean monthly relative humidifies are given in Table.

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Season	Months	Humidity (%)	
		8am	5am
Summer	Apr-Sep	60	41
Winter	Oct- Mar	76	50

Source: Meteorological Department Lahore

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Averag e high °C (°F)	19.1 (66.4	22.1 (71.8)	27.4 (81.3)	33.7 (92.7)	39 (102)	40.8 (105.4)	36.1 (97)	34.6 (94.3)	35 (95)	33 (91)	27 (81)	21.2 (70.2)
Daily mean °C (°F)	12.2 (54)	15 (59)	20.3 (68.5)	26 (79)	31 (88)	33.8 (92.8)	31.4 (88.5	30.2 (86.4)	29.5 (85.1)	25.4 (77.7)	18.6 (65.5)	13.4 (56.1)
Averag e low °C (°F)	5.3 (41.5	8 (46)	13.3 (55.9	18.4 (65.1)	23.1 (73.6)	26.9 (80.4)	26.7 (80.1	25.9 (78.6)	24 (75)	17.8 (64)	10.3 (50.5)	5.7 (42.3)

Monthly Average Temperature Sialkot

d. Wind

The wind blows throughout the year with highest velocities occurring during the summer months, June till July (2.9 to 3.6 knots at 0800 am and 2.7 to 2.9 at 0500 pm). Whereas the minimum wind speed is during the month of November (0.1 knots at 0800 am and 0.3 knots at 0500 pm). The

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direction is primarily towards northwest during winter and southeast during summer months. Average wind speed never exceeds 2.9 knots (1 knot = 1.6 km/h) at 0800 am. June and July are the months when windstorms occur.

6.2 BASELINE CONDITIONS

6.2.1 Groundwater Conditions

Samples 1 and 2 were taken from the hand pump (70-100 feet deep water) and monitoring has been done by the EPA approved Laboratory. Detail reports are attached. The Laboratory result shows that the Groundwater conditions at the Factory are in compliance with PEQS.



Figure 14 Ground Water Testing

Reports are attached with the EIA report.

6.2.3 Ambient Air Quality

Samples for determining ambient air quality were taken from the project location. Laboratory test results report are attached. Ambient air quality data is in compliance with PEQS.

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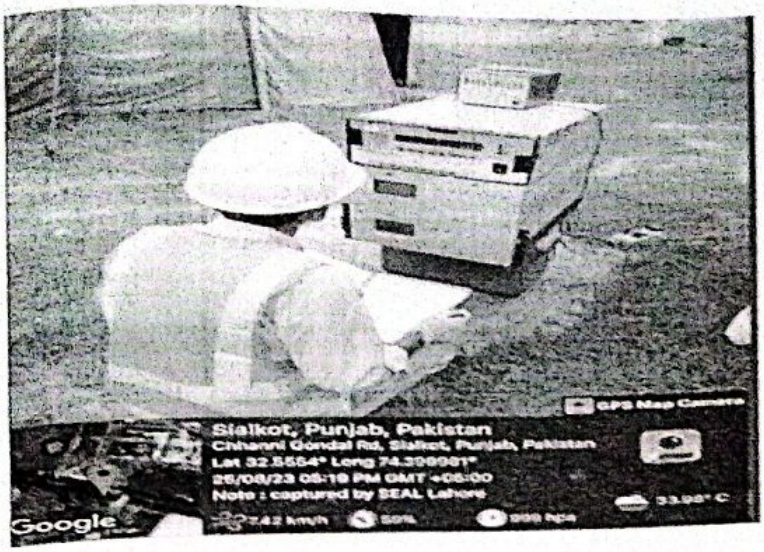


Figure 15 Ambient Air Quality Monitoring

6.2.4 Ambient Noise

Noise levels were taken from different locations of the project site and results are attached. which are in compliance with the PEQS. The results imply that the project area is tranquil because there is no major noise producing industrial activity in the project area.

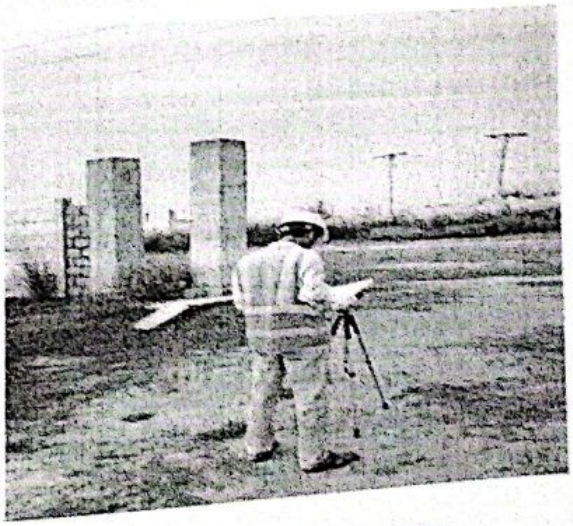


Figure 16 Ambient Noise Monitoring

Reports are attached along with EIA Report.

6.3 ECOLOGICAL ENVIRONMENT

Description of ecological environment of the project area includes terrestrial flora and fauna, forests, rare/endangered species, and protected areas.

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6.3.1 Flora and Forests

Biodiversity is 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. It is in this background that the biodiversity of the area is discussed below: The Sialkot District has been a part of the ecological zone called thorn forest but with the introduction of extensive irrigation network of canals for development of agriculture, industrial development and urbanization has changed its biological features. Most of the part of the district is now agriculture zone with human related or human dependent fauna and flora and for the most part of the district is now an agricultural zone. About 2.17 % of the total area of the district is under human forest plantation of trees of economic importance like Shisham, Keeker, Mulberry that are used in construction and making sports goods and furniture. Other introduced species are Mesquite an invasive species and Safeda Sheesham Bohar and Bakain are also seen in and around the urban areas. The district Sialkot is the host of a variety of flora.

The indigenous tress are Lasoora, Bairy, Siris, Keeker, Phali, Khajoor, Toot and Paper Mulberry These are commonly found along the edges of agricultural fields. About 54 km2 of the Bajwat region in the Sialkot District is the Bajwat Game Reserve. About 16 km2 of the area around Marala Headworks is also protected within the game reserve and is of considerable importance for wintering waterfowl. Fortunately, from a planning perspective all development activities foreseen under PCIIP will be far away from these environmentally sensitive areas and will therefore not be adversely affected by any of the proposed interventions.

Forestry (Flora)

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

Main Fruits

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The commonly occurring main fruits of the area are as below:

Sugarcane, Melons, Mango; Orange; Guava and Jamun.

Crops

The following are the major crops being grown during the kharif (summer1) and rabi (winter2).

Kharif crops:

Rice; Maize and Sugarcane

Rabi crops:

Wheat; Gram; Barley and Rabi Fodder

Vegetables

The commonly available vegetables of the area are: Carrots, radish, ladyfinger, cauliflower, cabbage, turnip, red and green chilli, spinach, peas, pumpkins, bitter gourd, and tomatoes.

Wildlife (Fauna)

There is no likelihood of any wildlife, game reserves or else around the project site. Buffaloes and sheep are common throughout the city. 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.

Fisheries and Aquatic Biology

There are no worth mentioning sources of fishery in the form of fresh water fishery or fishing ponds or else in the area of influence of the project.

6.3.3 Rare/Endangered Species and Protected Areas

There are no endangered/rare species and protected areas in the project area.

6.4 SOCIOECONOMIC ENVIRONMENT

Socioeconomic survey was conducted for the settlements located within 1 km distance from the project site. There are some newly established Housing societies within 1-3 Km span. Most nearest societies are in development phase. The socioeconomic profile of the area comprises quality of

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life, health profile, cultural values, infrastructure, and perceptions of the community about industrial activities in the area. These aspects are described in detail hereinafter.

Sialkot is located close to the Indian border some 125 km north of Lahore. It is a major industrial center, specializing in leather products, surgical instruments, diesel engines, pharmaceuticals, steel rolling mills, textiles and sports goods. There are at least 264 tanneries, 244 leather garment producing units, 900 leather sports goods producing units, 57 rice husking mills and 14 flour mills in the city.

6.5 Settlement Pattern

The district was subdivided into five tehsils namely: Sialkot, Pasrur, Zafarwal, Raya and Daska, the headquarters of each being at the place from which it is named. The chief towns of the district were Sialkot, Daska, Jamki, Pasrur, KilaSobha Singh, Zafarwal and Narowal.

6.6 Demographic Characteristics of the Population

The field survey (including interviews, focus group discussions, census, and village profile) was carried out to collect the socioeconomic data from the project affected people as well as other general population to accomplish the baseline information, which will provide the basis for subsequent monitoring and evaluation studies. The demographic features include the information on household's profile, gender composition, occupations, and literacy status of the population residing in the project area. The information relating to the demographic profile of the people in the project area are described below.

6.7 Family Size and Gender Composition

Based on the field survey of sample affected people/ local population, the average family size computed to be 6.82, out of which the proportion of male and female members is 59 percent and 41 percent respectively as shown in Table 6.1and Figure 6.2.

Table 6.1Average Family Size & Gender Composition of the Sample Households

Average family Size (No.)	Gender Composition (%)	
	Male	Female
6.82	58.98	41.02

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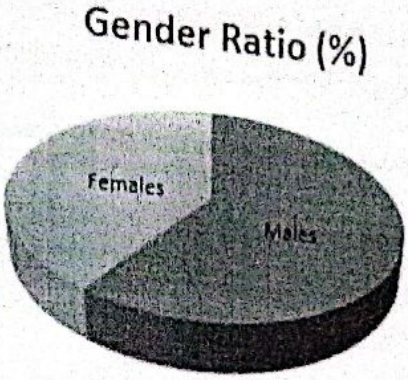


Figure 17 Gender Composition in Sialkot

6.8 Literacy Status

The general disparity in education exists in low-income communities. Sialkot is blessed with higher educational facilities like Islam College of Engineering & Management sciences. School of Engineering, University of Management & Technology, Sialkot Campus and several government and private colleges for boys and girls and technical/ poly institute.

The field survey has shown that on the whole, in the vicinity of the project site, the average literacy rate of the local population estimated as 61.98%. The percentage of literacy rate among males and females residing in the vicinity of the project area is computed to be 68.53 and 52.55 percent respectively.

Average Literacy Rate of the Sample Households

	Average Literacy Rate (%)	
	Male	Female
Overall	68.53	52.55
61.98		

6.9 Occupation

In the vicinity of the project area, the sample population is involved in different occupations in order to meet their living expenditure. Out of total sample population, 70 percent are involved in self business like shops/ stores, while 14 percent are employed in various services. About 7 percent

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population involved in farming activities. The percent of labour both skilled and un-skilled of the area is 15, while 4 percent are daily-wage labourers and others respectively.

Majoe Occupation of the sample population

Major Occupations (%)				
Business	Service	Farming	Labour (skilled & un-skilled)	Other
70	14	7	15	4

6.10 Average Income of sample household

The assessment of annual household income is one of the important indicators to measure the well-being/ livelihood of the household. In the field survey, the major sources of income include; income from shops, farming, livestock, off-farm work, business, daily wages and remittances etc. Based on the data summarized in Table , the average annual household income computed to be Rs. 322,400. On annual per capita basis, the corresponding figure is Rs 37,903.

Average Household Income (Rs.)		Average Per Capita Income (Rs.)	
Annual	Monthly	Annual	Monthly
322,400	25,700	37,903	3,720

6.11 Availability of Basic Infrastructure

During the field survey, the availability/ or access to basic infrastructure/ services to the local population was recorded. In this context, it was observed that on the whole, all basic infrastructure/ facilities, i.e. drinking water, education & health facilities, electricity, telephone/ cell, roads, fuel/ filling station etc. were available to almost all the sample population resided in the vicinity of the project area.

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6.11.1 Women Issues

On overall basis, about 41.02% of the sample population are women. Women are participating to alleviate poverty, enhance economic growth and human well-being of the families by involving in farming and other income generation activities. It can be concluded that in the vicinity of the project area, women are involved in several households and income generation activities. Some of the major activities are listed below.

- Agricultural/ farming activities, wheat harvesting, rice transplanting and harvesting/ threshing.
- Livestock rearing and caring activities – fodder cutting, watch & ward to animals, milking, by-product, milk selling, sale of animals
- Poultry& health care.
- Education- teaching, academy, tuitions at home.
- Participate in social obligations/ ceremonies.
- Other Activities - washing clothes, cooking, child caring, etc.

In general, there is no issue with the women of the study area associated with the implementation of the project. However, during the consultative meetings, local women pointed out that some suitable jobs to their male members during the construction activities should be provided. In this way, in addition to their jobs, they can also look after their household activities.

CHAPTER 7: POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

This section discusses the potential environmental impact of proposed project, methodologies for impact identifications and characteristics of impacts including nature, magnitude, extent and location, timing, duration, reversibility, risk The assessment carried out in this Section is based on potential impacts on overall environmental receptors within the project area.

7.1 Environmental Impacts due to project location

Project is present in the industrial area of the District. No nearby human settlement exists within the radius of 500 meter. Unit is proposed extension of a spinning mill; site does not

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fall in the category of sensitive area and no environmentally sensitive localities exist within radius of study area. The only issue which can arise due to the location of the subject project could be the issue of traffic congestion due to transportation of the construction material at the project site. If the project proponent maintain HSE conditions and comply with the PEQS limits than, there will not be any significantimpacts of the project on the environment.

If the mitigation measures are effectively implemented, the residual impact of the Subject project activities on the area's geophysical environment is expected to be insignificant.

Impact significance: Low or may be positive

Nature of impact: Direct

Duration: Short-term

Timing: Construction phase

Reversibility: NA

Likelihood: Low (unlikely),

Consequences: Mild or may be positive

7.1 Mitigation Measures for location phase impacts

- Project site should have good road infrastructure and efficient road infrastructure already exists there that is used currently to access the site and there is no issue of the road congestion due to the wide, good and paved road.
- Location can be considered as the positive impact due to utilization of the product in the same District.
- The project will provide the jobs to the local residents as well as to those fromthe suburban areas.

7.2 Environmental Impacts due to the project design

Subject project is the construction of a tannery unit. Area for parking, solid waste management and waste water treatment facility will be made available within the subject project. Firefighting plan, health & safety plan, tree plantation plan, emergency response plan will be incorporated during the designing phase of the project. The subject project will consist of;

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- Receiving and Sorting
- Preservation and Storage
- Soaking
- Liming
- Deliming and Bating
- Tanning
- Neutralization
- Dyeing
- Fatliquoring
- Drying
- Finishing

Here are concise points outlining major environmental impacts due to development related to tannery design:

1. **Habitat Disruption:** Tannery construction can disrupt natural habitats and ecosystems.
2. **Water Pollution:** Poor wastewater management can lead to water pollution.
3. **Air Pollution:** Tannery emissions contribute to air pollution.
4. **Resource Depletion:** Excessive water use and energy consumption deplete resources.
5. **Waste Generation:** Inadequate waste management increases pollution.
6. **Health Risks:** Poor practices pose health risks to workers and communities.
7. **Biodiversity Impact:** Habitat disruption harms local biodiversity.
8. **Social Disruption:** Poor planning can displace communities and cause conflicts.
9. **Regulatory Issues:** Ignoring regulations leads to legal and reputational problems.
10. **Energy Inefficiency:** Inefficient systems contribute to higher energy use.
11. **Visual and Noise Pollution:** Poor design generates visual and noise pollution.
12. **Soil Contamination:** Inadequate chemical disposal leads to soil contamination.
13. **Water Scarcity:** Excessive water use contributes to local water scarcity.

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14. **Greenhouse Gas Emissions:** Energy-intensive processes increase emissions.

15. **Land Use Changes:** Tannery development alters land use patterns.

Impact significance: Low or may be positive

Nature of impact: Direct

Duration: Long-term

Timing: Construction phase

Reversibility: NA

Likelihood: Low (unlikely),

Consequences: Mild or may be positive

7.3 Mitigation measures and recommendations

Following are the mitigation measures and recommendations to minimize the anticipated impacts:

- Emergency exist points should be marked within the project building.
- Firefighting system should be designed for the emergency situations.
- Geo-technical investigation of the project site should be conducted.
- Electricity system should be designed safe and sound.
- Electricity wires should be covered by thick plastic/electricity resistant covers.

7.4 Environmental Impacts during the construction phase

Impacts related to the construction phase of the subject project are discussed below:

Construction Phase Impact Significance

Issue/Activity	Impact				
	Air	Water	Land	Socio-economic	Occupational Health and Safety (OHS)
Dust Generation	2	1	1	1	2

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Dumping of Construction Waste	1	1	2	2	2
Noise and Vibration	1	1	1	2	2
Traffic Volume	2	1	2	2	2
Domestic Waste	1	2	2	1	2

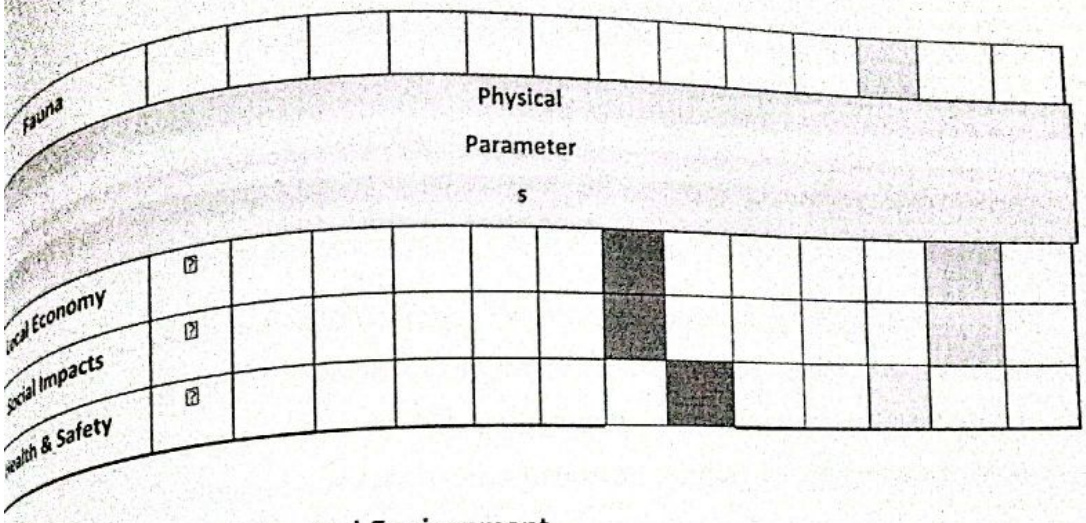
1 = no impact

2-5 = insignificant to severe impact

Impact Matrix Checklist for Construction Phase

Environmental Sensitivities	Intensity of Impact						Impact Nature		Impact Significance				
	Low Intensity	Moderate Intensity	High Intensity	Local	Moderate	Regional	Beneficial	Adverse	Insignificant	No Impact	Short Term	Moderate	Long Term
Physical Parameters													
Air Quality		☑		☑									
Noise		☑			☑								
Water Quality		☑			☑								
Biological Parameters													
Land Environment													
Flora													

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7.4.1 Impacts on the Physical Environment

Habitat Disruption and Loss: The establishment of tanneries often requires land clearing and construction activities that result in the direct alteration or destruction of natural habitats. This disruption can lead to habitat loss for various plant and animal species, affecting biodiversity and disrupting ecological balances. As habitats are transformed into industrial areas, the unique ecosystems they support may be irreversibly damaged, leading to the decline or even extinction of certain species.

Land Use Changes and Deforestation: Tannery development can lead to shifts in land use, converting previously untouched or agricultural land into industrial zones. This transformation often involves deforestation, which not only reduces the carbon sequestration potential of forests but also contributes to the loss of critical wildlife habitats. The disruption of natural land cover can also result in increased soil erosion, sediment runoff, and altered hydrological patterns, further impacting local ecosystems.

Water Pollution and Ecological Damage: The tanning process involves the use of various chemicals, including tanning agents, dyes, and finishing compounds. Inadequate waste management practices can lead to the discharge of untreated or improperly treated effluents into nearby water bodies. These chemical-laden discharges can cause water pollution, killing aquatic life, disrupting aquatic ecosystems, and contaminating water resources that communities depend on.

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Soil Contamination and Agricultural Impacts: The mishandling or improper disposal of tannery chemicals can lead to soil contamination. Pollutants from these chemicals can leach into the soil, affecting soil fertility, altering microbial communities, and potentially entering the food chain through crops or grazing animals. Contaminated soil can have far-reaching consequences, reducing agricultural productivity and posing health risks to both humans and wildlife.

Air Pollution and Human Health Concerns: Tannery operations emit pollutants such as volatile organic compounds (VOCs), hydrogen sulfide, and particulate matter into the air. These emissions not only contribute to air pollution but can also pose health risks to nearby communities. Inhalation of these pollutants can lead to respiratory issues, allergies, and other health problems, impacting the well-being of both humans and animals in the vicinity.

Resource Depletion and Water Scarcity: The tanning process requires substantial amounts of water for soaking, rinsing, and chemical treatment. Without proper water management practices, tanneries can contribute to local water scarcity, depleting freshwater resources and potentially causing conflicts over water access. Additionally, energy-intensive processes contribute to increased electricity demand, further straining energy resources.

Waste Generation and Improper Disposal: Tannery operations generate various types of waste, including chemical sludge, trimmings, and other byproducts. Without adequate waste management practices, these waste streams can end up in landfills, incinerators, or even in natural ecosystems. Chemical waste, in particular, poses significant environmental risks, potentially contaminating soil, water, and air.

Greenhouse Gas Emissions and Climate Impact: The energy consumption associated with tannery operations, especially those relying on fossil fuels, contributes to greenhouse gas emissions. These emissions, primarily carbon dioxide, contribute to global warming and climate change, affecting regional weather patterns, sea levels, and ecosystems worldwide.

Visual and Noise Pollution: The physical footprint of tannery facilities, including buildings, storage areas, and waste disposal sites, can alter the visual landscape of an area. Industrial structures can negatively impact the aesthetic appeal of the surroundings. Additionally, machinery and other operational activities can generate noise pollution, disturbing local communities and wildlife.

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Sedimentation, and Hydrological Changes: Construction activities during tannery opment can lead to soil erosion and sediment runoff, particularly in areas with altered graphy. These sediments can end up in nearby water bodies, causing sedimentation and ding water quality, aquatic habitats, and aquatic life. Furthermore, changes in land use and ology can disrupt natural water flow patterns, potentially causing flooding or altering water ability downstream.

4.2 Impacts on Biological Environment

s of Biodiversity: Habitat destruction and disruption due to tannery development can lead to ss of biodiversity. Species dependent on the affected habitats may be displaced or face allenges in finding suitable alternatives. This disruption can disrupt ecological balances and lead declines in certain plant and animal populations.

ecies Displacement: The alteration of natural habitats can force species to migrate or seek new bitats. This displacement can lead to increased competition for resources and potential conflicts etween different species, potentially leading to population declines and shifts in species mposition.

Harm to Aquatic Life: Water pollution resulting from tannery operations can harm aquatic cosystems. Contaminants discharged into water bodies can affect fish, amphibians, and aquatic lants. This pollution can disrupt food chains, cause reproductive issues, and lead to long-term cological damage.

Impact on Soil Microorganisms: Soil contamination from tannery chemicals can harm soil microorganisms crucial for nutrient cycling and maintaining soil health. This disruption can affect plant growth and the overall stability of ecosystems.

Pollution-Induced Stress: Air and water pollution generated by tanneries can cause stress and health issues in organisms exposed to these pollutants. This can weaken immune systems, making species more vulnerable to diseases and environmental changes.

Changes in Plant Communities: Habitat disruption and pollution can lead to changes in plant communities. Some species may thrive in disturbed environments, while others that are more sensitive might decline, affecting the overall structure and function of ecosystems.

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Altered Ecosystem Services: Changes in biological communities can impact the ecosystem services that ecosystems provide. For example, disruptions in pollinator populations can affect crop production, while disruptions in nutrient cycling can impact soil fertility and overall ecosystem health.

Invasive Species Introduction: Development activities can introduce invasive plant and animal species, which can outcompete native species and disrupt local ecosystems. These invasions can have cascading effects on native species and their interactions.

Disruption of Migratory Routes: Development near water bodies can disrupt the migratory routes of birds and aquatic species. This disruption can affect breeding and feeding patterns, leading to population declines and altering the dynamics of ecosystems.

Genetic Diversity Loss: Habitat fragmentation and disruption can limit gene flow between populations, leading to reduced genetic diversity. This can make species more susceptible to diseases and environmental changes, impacting their long-term survival.

Conservation Challenges: Tannery development in ecologically sensitive areas can pose challenges to conservation efforts. Rare and endangered species might be threatened, and the establishment of protected areas can become more difficult due to habitat alteration.

7.4.3 Impacts on Socioeconomic Environment

Employment Opportunities: Tannery development creates new employment opportunities for local communities. Jobs are generated across various sectors, including skilled positions in tannery operations, such as leather processing and quality control, as well as support roles like administration, maintenance, and transportation. These opportunities can be especially beneficial in regions with limited job prospects.

Income Generation: The jobs generated by tannery development contribute to increased income for workers and their families. This infusion of income can improve living standards, provide access to better healthcare and education, and elevate overall quality of life for individuals in the community.

Local Economy Boost: The presence of a tannery can stimulate the local economy by creating demand for goods and services. Local businesses such as food vendors, transportation providers,

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and retailers experience increased patronage due to the influx of workers and visitors associated with the tannery.

Skill Development: Tannery employment offers opportunities for skill development and training. Workers gain expertise in specialized areas of leather processing, machinery operation, and quality control. These skills enhance their employability, both within the tannery sector and beyond, leading to improved career prospects.

Technology Transfer: Tannery development often introduces new technologies and practices to local areas. These technological advancements can lead to knowledge transfer and skill acquisition among the local workforce, fostering a culture of innovation and adaptation.

Infrastructure Development: Tannery development often necessitates improvements in infrastructure. Roads, utilities, transportation networks, and public facilities may be upgraded or established to accommodate the needs of the tannery and its workforce. These improvements benefit the entire community by enhancing access to essential services.

Diversification of Economy: In regions heavily reliant on a single industry, such as agriculture, the establishment of a tannery can contribute to economic diversification. This diversification reduces the community's vulnerability to economic fluctuations and market uncertainties.

Revenue Generation: Governments can generate revenue from tannery operations through taxes, tariffs, and fees. These funds can be reinvested in public services, such as education, healthcare, infrastructure, and social welfare programs, contributing to overall community development.

Social Challenges: Rapid tannery development can strain social services and resources. The sudden influx of workers and their families can overwhelm existing healthcare facilities, schools, and housing options, leading to challenges related to access and quality.

Health and Safety Concerns: Tannery operations involve the use of chemicals and potentially hazardous materials. Poorly regulated tanneries can pose health risks to workers and nearby communities due to exposure to chemicals, pollution, and unsafe working conditions. These risks can lead to long-term health issues for workers and residents.

Social Inequality: The benefits of tannery development are not always evenly distributed. If not managed inclusively, development can exacerbate existing social inequalities, with certain groups

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benefiting more than others. Women, minorities, and marginalized communities may have limited access to the positive impacts of development.

Cultural Changes: Tannery development can lead to cultural changes within local communities. Traditional practices, lifestyles, and cultural heritage can be influenced by industrialization and urbanization, potentially leading to shifts in values, social norms, and ways of life.

Community Displacement: In some cases, tannery development can lead to the displacement of communities or changes in land use. Land acquisition for tannery infrastructure or related facilities can disrupt traditional communities, lead to loss of livelihoods, and impact social cohesion.

Conflicts and Tensions: The various impacts of tannery development, including land acquisition, resource use, and employment opportunities, can trigger conflicts and tensions among different stakeholders. Competing interests between local communities, tannery industries, and governments can lead to disputes that require careful management.

Environmental Degradation: If not managed responsibly, tannery development can lead to environmental degradation, negatively impacting the quality of life for nearby communities. Pollution, water scarcity, and ecosystem disruption can harm the environment upon which communities rely.

Community Engagement: Responsible tannery development involves meaningful engagement with local communities. Inclusion of local voices, addressing concerns, and establishing transparent communication channels are essential for building trust and ensuring that development benefits are equitable and sustainable.

7.4.4 Workers Accidents and Hazards during Construction

Falls from Heights: Construction workers often perform tasks at elevated levels, such as installing roofing, working on scaffolding, or climbing ladders. Without proper fall protection measures, workers are at risk of falling and sustaining severe injuries, including broken bones, spinal injuries, and head trauma. Ensuring the use of safety harnesses, guardrails, and proper scaffolding setups is crucial to prevent these accidents.

Electrical Hazards: Construction sites involve electrical equipment, wiring, and tools. Workers can be exposed to electrical hazards when working near live wires, faulty wiring, or malfunctioning electrical equipment. Electrical shocks, burns, and fires can occur if safety precautions are not

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followed. Adequate training, proper insulation, and adherence to lockout/tagout procedures are essential to mitigate these risks.

Heavy Equipment and Machinery: The operation of heavy machinery and equipment, such as cranes, bulldozers, and excavators, poses significant risks if not handled by trained operators. Collisions, equipment overturns, and crush injuries can result from improper use, lack of training, or mechanical failures. Ensuring that operators are certified, equipment is well-maintained, and safety protocols are followed is critical to prevent accidents.

Falling Objects: Construction sites involve moving materials, tools, and equipment. Objects dropped or falling from heights can cause severe head, neck, or back injuries to workers below. Wearing appropriate personal protective equipment, such as hard hats, can reduce the risk of head injuries from falling objects.

Trench and Excavation Hazards: Workers involved in trenching and excavation activities face the risk of cave-ins, which can bury workers under soil or debris. Proper shoring, sloping, or shielding techniques must be used to prevent trench collapses. Adequate ventilation and protective systems are essential to ensure worker safety in confined spaces.

Confined Spaces: Working in confined spaces like tunnels, pits, or tanks presents risks such as inadequate ventilation, toxic gas buildup, and lack of oxygen. Without proper training and equipment, workers can be exposed to life-threatening conditions. Thorough assessment, continuous monitoring, and adherence to confined space entry procedures are vital to prevent accidents.

Chemical Exposure: Construction activities involve the use of various chemicals, from paints and adhesives to cleaning agents and solvents. Without proper ventilation and personal protective equipment, workers can be exposed to harmful fumes, vapors, and skin irritants. Providing proper training, using effective ventilation systems, and requiring the use of appropriate PPE are essential to prevent chemical-related injuries.

Noise and Vibrations: Construction sites are often noisy environments due to heavy machinery, equipment, and tools. Prolonged exposure to high noise levels can lead to noise-induced hearing loss. Additionally, vibrating tools and equipment can cause hand-arm vibration syndrome, resulting in long-term health issues. Regular noise monitoring, use of hearing protection, and

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rotation of tasks to minimize vibration exposure are crucial to protect workers' hearing and well-being.

Manual Handling and Overexertion: Tasks that involve lifting, carrying, or moving heavy materials manually can lead to musculoskeletal injuries, strains, and sprains. Workers not trained in proper lifting techniques or who lack the necessary assistance are more susceptible to these injuries. Providing ergonomic training, mechanical lifting aids, and implementing safe lifting practices can help prevent these injuries.

Fire and Explosions: Welding, cutting, and other hot work activities can generate sparks that ignite flammable materials, causing fires or explosions. Adequate fire prevention measures, fire extinguishers, proper storage of flammable materials, and adhering to hot work permits are crucial to prevent fire-related accidents.

Slips, Trips, and Falls: Construction sites often have uneven surfaces, debris, and temporary walkways. These conditions increase the risk of slips, trips, and falls. Proper housekeeping, clear pathways, well-maintained walking surfaces, and appropriate footwear are essential to prevent these accidents.

Heat Stress and Cold Stress: Depending on the climate, construction workers can face heat stress from high temperatures or cold stress from low temperatures and wind chill. These conditions can lead to dehydration, heat stroke, hypothermia, and frostbite. Providing access to shade, water, and proper clothing is crucial to mitigate these risks.

Inadequate Personal Protective Equipment (PPE): Without proper PPE, workers are exposed to greater risks. Providing and enforcing the use of appropriate safety gear, such as helmets, gloves, goggles, hearing protection, and respiratory protection, is essential to protect workers from various hazards.

Lack of Training: Inadequate training in construction tasks, machinery operation, and safety protocols can increase the likelihood of accidents. Comprehensive training programs should cover hazard identification, safe work practices, emergency procedures, and the proper use of equipment and machinery.

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5.5 Mitigation Measures

5.5.1 Environmental Impacts:

1. **Habitat Disruption and Loss:**

Mitigation: Conduct comprehensive environmental impact assessments (EIAs) to identify critical habitats. Implement habitat restoration plans that include replanting native vegetation, creating artificial habitats, and establishing wildlife corridors to reconnect fragmented areas.

2. **Water Pollution:**

Mitigation: Install efficient wastewater treatment systems that incorporate physical, chemical, and biological processes to effectively remove pollutants. Regularly monitor effluent quality, comply with discharge standards, and ensure proper maintenance of treatment facilities.

3. **Air Pollution:**

Mitigation: Invest in advanced air pollution control technologies, such as scrubbers and filters, to capture and reduce emissions. Opt for cleaner production methods, like water-based finishes, to minimize the release of volatile organic compounds (VOCs).

4. **Resource Depletion:**

Mitigation: Implement water-efficient processes, such as closed-loop water systems and water recycling, to reduce water consumption. Integrate renewable energy sources, like solar panels, to offset energy demands and decrease reliance on fossil fuels.

5. **Biodiversity Impact:**

Mitigation: Develop biodiversity conservation plans in collaboration with local conservation organizations. Establish buffer zones around ecologically sensitive areas and adopt practices that preserve habitat diversity and connectivity.

6. **Soil Contamination:**

Mitigation: Store chemicals in secure, leak-proof containers to prevent spills. Implement spill response protocols, and regularly inspect storage areas. Remediate contaminated soil using methods like soil washing or bioremediation.

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15 Mitigation Measures

15.1 Environmental Impacts:

1. **Habitat Disruption and Loss:**

Mitigation: Conduct comprehensive environmental impact assessments (EIAs) to identify critical habitats. Implement habitat restoration plans that include replanting native vegetation, creating artificial habitats, and establishing wildlife corridors to reconnect fragmented areas.

2. **Water Pollution:**

Mitigation: Install efficient wastewater treatment systems that incorporate physical, chemical, and biological processes to effectively remove pollutants. Regularly monitor effluent quality, comply with discharge standards, and ensure proper maintenance of treatment facilities.

3. **Air Pollution:**

Mitigation: Invest in advanced air pollution control technologies, such as scrubbers and filters, to capture and reduce emissions. Opt for cleaner production methods, like water-based finishes, to minimize the release of volatile organic compounds (VOCs).

4. **Resource Depletion:**

Mitigation: Implement water-efficient processes, such as closed-loop water systems and water recycling, to reduce water consumption. Integrate renewable energy sources, like solar panels, to offset energy demands and decrease reliance on fossil fuels.

5. **Biodiversity Impact:**

Mitigation: Develop biodiversity conservation plans in collaboration with local conservation organizations. Establish buffer zones around ecologically sensitive areas and adopt practices that preserve habitat diversity and connectivity.

6. **Soil Contamination:**

Mitigation: Store chemicals in secure, leak-proof containers to prevent spills. Implement spill response protocols, and regularly inspect storage areas. Remediate contaminated soil using methods like soil washing or bioremediation.

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1. **Waste Generation:**

Mitigation: Implement waste segregation and recycling programs for different types of waste generated during tannery processes. Collaborate with certified waste disposal services for proper treatment and disposal of hazardous waste.

8. **Visual and Noise Pollution:**

Mitigation: Incorporate landscape design elements that blend with the natural surroundings, reducing the visual impact of industrial structures. Use noise barriers and soundproofing materials to mitigate noise pollution and create quieter work environments.

7.5.2 Socioeconomic Impacts:

1. **Health and Safety Concerns:**

Mitigation: Develop comprehensive safety training programs covering hazard identification, safe work practices, and emergency procedures. Conduct regular safety drills, provide access to first aid kits, and establish protocols for reporting and addressing safety concerns.

2. **Social Inequality:**

Mitigation: Implement fair wage policies, provide equal opportunities for training and advancement, and establish mechanisms to address discrimination or unequal treatment. Engage with local communities to ensure that underrepresented groups are included in employment opportunities.

3. **Community Engagement:**

Mitigation: Establish open channels of communication with local communities through regular meetings, feedback sessions, and informational campaigns. Actively listen to concerns and feedback and address issues promptly to build trust and transparency.

4. **Cultural Changes:**

Mitigation: Conduct cultural impact assessments to identify potential impacts on local cultures and traditions. Collaborate with community leaders to find ways to integrate development while respecting and preserving cultural heritage.

5. **Conflicts and Tensions:**

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Establish clear agreements with stakeholders, including communities, government and non-governmental organizations. Set up dispute resolution mechanisms and processes to address conflicts and tensions effectively.

3.3.3 Biological Impacts:

1. Loss of Biodiversity:

Mitigation: Develop and implement biodiversity management plans that include habitat restoration, reforestation, and habitat enhancement activities. Collaborate with local conservation groups and experts to ensure effective biodiversity conservation.

2. Species Displacement:

Mitigation: Conduct pre-construction surveys to identify species at risk of displacement. Create alternative habitats nearby and establish monitoring programs to track the movement and behavior of displaced species.

3. Impact on Soil Microorganisms:

Mitigation: Implement sustainable land management practices that reduce soil disturbance and protect soil ecosystems. Use organic fertilizers and minimize the use of chemical inputs to promote healthy soil microbial communities.

4. Pollution-Induced Stress:

Mitigation: Invest in advanced pollution control technologies to reduce emissions of harmful pollutants. Conduct regular air and water quality monitoring to identify potential sources of pollution and take corrective actions.

5. Changes in Plant Communities:

Mitigation: Develop and implement reforestation and re-vegetation plans using native plant species that support local ecosystems. Control the spread of invasive species to prevent their dominance in the area.

6. Community Displacement:

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Mitigation: Conduct thorough social impact assessments to identify potential displacement risks. Explore alternatives to displacement, such as on-site housing or alternative land use arrangements, and ensure fair compensation and support for affected communities.

2.5.4 Measures for Workers Safety

1. **Comprehensive Safety Training:**
   - Provide comprehensive safety orientation and training for all workers before starting construction.
   - Offer specialized training for tasks involving heavy machinery operation, working at heights, confined spaces, and hazardous materials.
2. **Use of Personal Protective Equipment (PPE):**
   - Mandate the use of appropriate PPE, including hard hats, safety goggles, ear protection, gloves, and steel-toed boots.
   - Ensure PPE fits well, is in good condition, and is worn consistently.
3. **Fall Protection Systems:**
   - Install and maintain guardrails, safety nets, and personal fall arrest systems when working at heights.
   - Conduct regular inspections of fall protection equipment and anchor points.
4. **Equipment Safety Checks:**
   - Perform regular inspections and maintenance of construction equipment and machinery to ensure proper functioning.
   - Remove malfunctioning equipment from service until repairs are made.
5. **Safe Lifting Techniques:**
   - Train workers in proper lifting techniques to prevent musculoskeletal injuries.
   - Provide mechanical lifting aids for heavy loads and encourage teamwork for lifting tasks.

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6. **Fire Prevention and Control:**
   - Establish clear fire prevention protocols, including safe storage of flammable materials and designated smoking areas.
   - Ensure all workers are aware of fire evacuation routes and conduct fire drills regularly.
7. **Electrical Safety:**
   - Implement lockout/tagout procedures for electrical equipment maintenance and repairs.
   - Label electrical panels and circuits, and provide proper training to handle electrical equipment safely.
8. **Confined Space Procedures:**
   - Establish strict entry procedures for confined spaces, including atmospheric testing, continuous monitoring, and emergency rescue plans.
   - Provide workers with confined space training and necessary equipment for safe entry.
9. **Hazard Communication:**
   - Clearly label hazardous materials and provide Material Safety Data Sheets (MSDS) for workers' reference.
   - Train workers on the proper handling, storage, and disposal of hazardous substances.
10. **Emergency Response Plans:**
    - Develop and communicate comprehensive emergency response plans for various scenarios, including medical emergencies, fires, and chemical spills.
    - Conduct regular drills to ensure workers know how to respond effectively.
11. **Site Security and Access Control:**

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- Implement strict access control measures to prevent unauthorized entry to construction areas.
- Use barriers and signage to guide workers and prevent entry into hazardous zones.

12. Regular Safety Audits:

- Conduct routine safety audits to identify potential hazards and non-compliance with safety protocols.
- Promptly address identified issues to maintain a safe work environment.

13. Supervision and Communication:

- Assign experienced supervisors to oversee construction activities and enforce safety measures.
- Establish clear communication channels for reporting safety concerns or near-miss incidents.

14. Health and Wellness Programs:

- Provide access to health resources, including first aid facilities and medical personnel on-site.
- Offer wellness programs to support workers' physical and mental well-being.

15. Reporting and Investigation:

- Encourage workers to report safety concerns without fear of reprisal.
- Investigate accidents, near-misses, and safety violations to identify root causes and prevent future occurrences.

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Chapter 8: Environmental management and monitoring program

8.1 Purpose and Objectives of the EMP:

The primary objectives of the EMP are to:

- Facilitate the implementation of the mitigation measures identified in the EIA.
- Define the responsibilities of the project proponent.
- Define a monitoring mechanism and identify monitoring parameters in order to:

1. Ensure the complete implementation of all mitigation measures.
2. Ensure the effectiveness of the mitigation measures.
3. Provide a mechanism for taking timely action in the face of unanticipated environmental situations.
4. Identify training requirements at various levels.

8.2 Management Approach:

The overall responsibility for compliance with the environmental management plan rests with the project proponent.

A certain degree of redundancy is inevitable across all management levels, but this is in order to ensure that compliance with the environmental management plan is crosschecked.

8.3 Institutional Capacity

Following functionaries will be involved in the implementation of EMP:

- Project Proponent
- HSE/Project Manager
- In-Charge Administration
- Supervisor of project
- Environmental Engineer

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8.4 Training Schedules

Training for the management/contractors/engineers and workers on environmental aspects of the project will be arranged on biannually basis during the constructional phase of the project and on quarterly basis during the operational phase of the project.It will be imparted by a team of experienced trainers.

8.5 Training of building contractor

Training of building contractor & workers will be the part of the TORs regarding the construction of the scheme. The provisions given in EIA Report *Chapter 4 Screening of Potential Environmental Impacts & Their Mitigation Measures* will be followed.

TORs will be including the training and submission of reports in the following area:

1. Handling of Machineries in a safe way
2. Use of PPEs
3. Maintenance of vehicles and submission of Environmental Monitoring Reports
4. Maintenance of Water Consumption records
5. Testing of water and waste water and submission of Environmental Monitoring Reports
6. Placement of safety signs/boards during construction
7. Sprinkling of water on the roads and dusty tracks
8. Monitoring of generator emissions

Training regarding all other aspects of HSE will be ensured by the contractor during the construction phase.

8.6 Responsibility of EMP

Overall responsibility for implementation of EMP will be that of project proponent. He will appoint a HSE/Project Manager of relevant qualification. HSE/Project Manager will act as Environmental Manager and will manage all HSE condition at the PEQS.

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Impacts	Mitigation Measures
Project Location	
• Acquisition of land • Loss of environmentally sensitive areas • Changes in traffic pattern • Potential conflicts with stakeholders • Resettlement issues	• There is not any sensitive area near the project site. • Many other industries are also working near the project site. • The project proponent will achieve the PEQS at the boundary walls of the subject project to avoid the environmental impacts on the nearby industrial unit. • There is no need to change the traffic pattern due the development of the subject project because few industries have been developed at the same road. • It is recommended to settle the issues through scoping and specific group discussions. • No resettlement issues. • It is recommended for obtaining of approval from other relevant departments.
Project Design	
• Soil structure and soil bearing capacity • Road infrastructure design • Emergency exits • Firefighting system • Wastewater disposal system design • Electricity hazards	• Safe road infrastructure design should be provided at the project site. • Emergency exit points should be marked at the project site. • Firefighting equipment must be maintained at the site in good working condition to cope with any emergency situation. • Efficient wastewater disposal system should be designed for proper treatment of wastewater. • Electricity system should be designed safe and sound.

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8.7 Environmental Mitigation Plan by Sialkot Tannery Zone

8.7.1 Details of Non Saleable land for public utility buildings and civic amenities

The breakup of the non-saleable area earmarked for the public utility buildings and civic amenities is provided as under.

Sr. No.	Component	Area	
		Acres	%age
1	Business complex including bank, hotel, restaurant, technical training facilities, WTO, environment compliance, post office, designer's office and STGAL office.	4.13	17.8%
2	Common facility center (CFC)	1.12	4.8%
3	Fire station, bus terminal and public toilets	3.21	13.8%
4	Computerized weight station	0.49	2.1%
5	Private security office	0.12	0.5%
6	Main Mosque	2.66	11.5%
7	Transporters offices and truck stand	1.96	8.4%
8	Daily mosque	0.46	2.0%
9	Grid station	4.04	17.4%
10	Public utility building and civic amenities	2.27	9.8%
11	Restaurant	1.17	5.0%
12	Two first aid centers	0.37	1.6%
13	Parking for commercial area	0.64	2.8%
14	Nursery	0.34	1.5%
15	Public Toilets (Block-A)	0.24	1.0%
	Total Area	23.23	100.0%

8.7.2 Green Areas

Five green parks/areas are planned in STZ in area of 10.79 acres.

8.7.3 Roads & Pavements

Roads of three different widths have been proposed in STZ. The total land earmarked for road and pavements is approximately 78 acres.

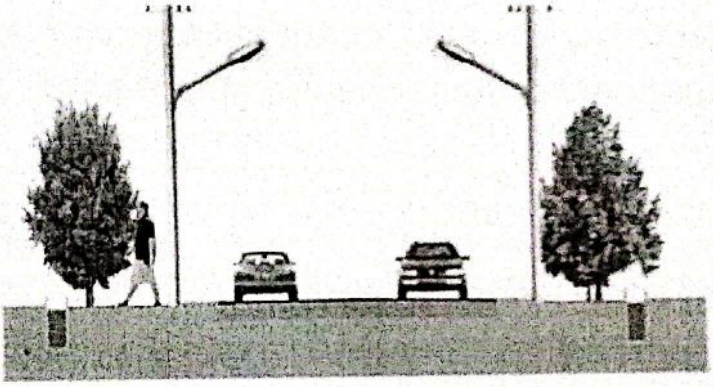
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8.7.4 Proposed Infrastructure and Utilities

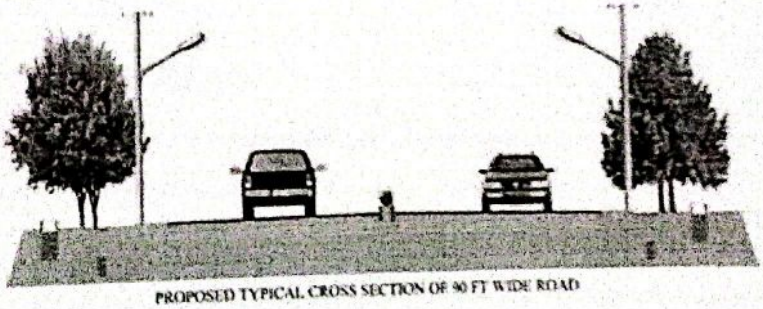
The Tannery Zone is designed to cater for the required infrastructure and utilities that have been deliberated below.

8.7.5 Road

The roads planned in STZ vary in widths from 60 feet, 90 feet and 120 feet. The level of the road is designed in such a way that it is one (1) foot above the main municipal road, named Channi Gondal road. The road levels within STZ are 4 to 5 feet above the existing ground level. The cross sections of each size of road are provided below.



PROPOSED TYPICAL CROSS SECTION OF 60 FT WIDE ROAD



PROPOSED TYPICAL CROSS SECTION OF 90 FT WIDE ROAD



Figure 18 Proposed Parking Areas

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8.7.6 Effluent Drain System

The effluent drain is RCC and open. However, the top of drain is approximately one (1) foot above the road level. This design provision has been made to restrict mixing of industrial effluent with other water bodies in the area. The effluent drain is designed to cater for the additional water expected from the rainfall in the channel. STZ shall make available typical drawings for connection of effluent from industry to the effluent drain of STZ.

8.7.7 Sewerage System

An underground sewage system with an underground septic tank shall be installed by each industry. The supernatant from the septic tank shall be discharged to the effluent drain. The effluent channel has been designed to cater for the flow of the effluent as well as sewage. STZ shall make available typical drawings for connection of sewage from industry to the effluent drain of STZ.

8.7.8 Drainage System

RCC Storm water drainage system has been designed to meet up to 3 inches/hour rainfall. Mainly the drainage system is open; however the drain along 120 feet road is under the pedestrian footpath. The width and depth of the drain varies according to the discharging requirement of its catchment area.

8.7.9 Electric Supply System

Estimated maximum peak demand is 22MW. The power supply to the zone is initially expected from the neighboring grid station through 11KV overhead feeder(s). Ultimately power requirement shall be met through a new 132/11KV grid station planned to be constructed in STZ over an area of 32 Kanals that shall be transferred to GEPCO. The internal distribution system is overhead.

8.7.10 Pollution Control Using Effluent Treatment and Recycling Plant

The following treatment and recycling facilities are proposed in STZ.

- Common Effluent Treatment Plant
- Landfill Site for Solid Waste Disposal

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- Chrome Recovery Plant
- Fat Extraction Plant

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CHAPTER 9: STAKEHOLDERS CONSULTATION

General

Public consultation refers to the process by which the concerns of local affected persons and others who have plausible stake in impacts assessment of the project or activity are ascertained with a view to taking into account all the material concerns in the project or activity design as appropriate. According to the IEE and EIA Review Regulations, 2000 public consultation is mandatory for any socio-environmental study. For this purpose, assessment survey and public consultation sessions held with different stakeholder groups that may be impacted. The consultation process was carried out in accordance with the guidelines laid by EPA, Punjab. The objectives of this process were to:

- Share information with stakeholders on proposed project installation and operation.
- To access the impacts on the physical, biological, and socio-economic environment.
- Understand stakeholder concerns regarding various aspects of the project.
- Understand the perceptions, assessment of social impacts and concerns of the communities of the project area.
- Find out the awareness level and situation of acceptability to identify any issues for the implementation of said project.
- To invite people to express their views about the positive/negative impacts on their life styles and environment.

This report include all the comments taken during consultation.

9.1 Consultation Mechanism

By reaching out to a wider segment of the population and using various communication tools such as participatory needs assessment, community consultation meetings, focus group discussions, in-depth interviews, and participatory rural appraisal EIA involved the community in active decision-making. This process will continue even after this EIA has been submitted, as well as during future

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EIA in which similar tools will be used to create consensus among stakeholders on specific environmental and social issues.

Secondary stakeholder consultations were more formal as they involved government representatives and local organizations, consulted during face-to-face meetings. They were briefed on the EIA process, the project design, and the potential negative and positive impact of the project on the area's environment and communities. It was important not to raise community expectations unnecessarily or unrealistically during the stakeholder consultation meetings in order to avoid undue conflict with community's leaders or local administrators. The issues recorded in the consultation process were examined, validated, and addressed in the EIA report.

This section involves communication of possible impacts and concerns with

- Proponents Environmental Management Team
- The responsible authority
- Other departments and agencies
- Environmental Practitioners and experts
- Affected and wider community

9.2 Proponents Environmental Management Team

Consultation regarding Construction of a new tannery unit by M/s Libermann International was done with Proponent's Environmental management Team and anticipated impacts were discussed. Concerns of locals, Environmental Practitioners departments were discussed and asked to consider them while & experts and Government construction of above-said project. Locals will be preferred for employment after providing proper training. Mitigations measures mentioned in EMP will be truly implemented.

9.3 The responsible authority

Overall responsibility for implementation of EMP will be that of project proponent. He will appoint an HSE/Project Manager of relevant qualification. HSE/Project Manager will act as Environmental Manager and will manage the all HSE condition at the PEQS.

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9.4 Other Departments and Agencies

Different Government departments were consulted regarding Construction of a new tannery unit in M/s Libermann International to treat wastewater generated from Leather manufacturing.

9.5 Consultation with Government Departments

Various government departments were consulted by the socio-environmental team of the consultants and concerned details about the project were noted down through personal interviews, group meetings, etc., in their offices.

9.6 Environmental Practitioners and experts

Consultation with Environmental Practitioners and experts was done and following comments and suggestions were observed.

Table 9.1 : Consultation with Environmental Practitioners and Experts

Sr. No.	Name	Qualification	Comments/Suggestions
1.	M. Abu Bakar	PhD Environmental Science	Following comments are summarized: • WWTP of latest technology must be installed with maximum efficiency • Regular monitoring should be conducted
2.	Amina Ali	Social Development Expert	She said that current project must be installed as : • it will improve sanitary conditions of the area • it is an environmentally friendly operation of sugar industry
3.	Sheraz Khan	WWTP Expert	He said that: • Locals should be preferred for employment • In case of outsider's residence must be provided

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			Proper mitigation measures must be adopted while construction and operation of this project
4.	Amanullah Khan	Chemist	He said that: • In case of removal of vegetation, trees must be planted after construction at designated green areas • More water conservation strategies must be adopted Solid waste must be collected and disposed off properly
5.	Ms. Tooba Anwar	Engineering Expert	She suggested to install WWTP of adequate capacity • to treat wastewater processing before discharge/reuse • Proper leveling and commissioning must be done after completion of construction Environmental manager must be specified to check compliance.

9.7 Affected and Wider Community

Social survey was conducted to consult with local community. Their concerns were noticed and discussed with proponent and their team. Majority was in favor of project their details are given below in **Table 9.2 .**

Table 9.2: Community Survey

Sr.#	Respondents	CNIC/Contact Nos.	concerns
1	Safdar Ali	34603-8973246-1	During the survey in the study area following concerns of the local community were noted:

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	Sami Ullah	34604-0466922-9	• Wastewater should be properly treated prior to final disposal in nearby drain. • Solid waste should be managed effectively by adopting the standard practices of the area. • Cleanliness of the area should be ensured. • An effective EMMP should be designed and enforced with true spirit. • Health of the workers should be ensured. • Plantation should be carried out at extensive scale. • Construction activity should be carried out during day hours. • Noisy activities should be confined. • Workers should be hired from local community. • PPE's must be provided to workers • Proper disposal of solid waste should be practiced. • Indigenous trees around the facility should be planted to control air pollution. • Sufaida can be planted in the project area as the area in known to be affected by the logging and salinity. • Removal of shrubs and bushes should be avoided to the extent possible.
	Atiq Ur Rehman	34501-1921976-7	
	Talal Khalid	34603-2918227-5	
	Safdar Hussain	334602-0566172-7	
	Iftikhar Ahmad Cheema	34601-0754086-9	
	Hasan Ali	34604-0587795-7	
	Zulfiqar Aslam	34601-0826476-7	
	Naveed Ahmad	34601-8633018-1	
10	Imran Nazir	34603-9914359-7	

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References

- Guidelines for Preparation and Review of Environmental Report
- Meteorology Department Data (From Website)
- National Environmental Policy
- Punjab Environmental Quality Standards (Self- Monitoring And Reporting By Rules, 2001)
- ISO 45001 for Health and Safety
- Pakistan Environmental Protection Act, 1997
- Pakistan Environmental Protection Order (PEPO) 198
- The Land Acquisition Act 1894
- The Punjab Local Government Ordinance, 2001
- https://tribune.com.pk/story/2332620/leather-sector-issues-need-immediate-attention
- https://sdpi.org/environmental-impact-of-tanning-and-leather-products-manufacturing-industry-in-nwfp-pakistan-w-55/publication_detail
- https://www.researchgate.net/publication/317381731_Leather_Industry_and_Environment_Pakistan_Scenario
- https://www.researchgate.net/publication/45640053_Effects_of_Leather_Industry_on_Health_and_Recommendations_for_Improving_the_Situation_in_Pakistan
- https://www.sciencedirect.com/science/article/pii/S2666016421000839
- https://link.springer.com/article/10.1007/s11356-018-3717-0
- https://www.iisd.org/system/files/publications/sdpifullrprt_s.pdf
- https://www.sciencedirect.com/topics/earth-and-planetary-sciences/leather-industry
- https://www.researchgate.net/publication/317381731_Leather_Industry_and_Environment_Pakistan_Scenario
- http://www.cpi.org.pk/EnvironmentalManagement_CTPKT.aspx
- Agriculture and Agri-Food Canada. (2018). Riparian buffers.
- practices/agroforestry/shelterbelt-planning-and-establishment/design/riparian buffers/?id=1344888191892 (2018).

Scanned with CamScanner

- Bagchi , P. (2010). Unregulated Sand Mining Threatens Indian Rivers. The JournalIndia Together, 21, 7-9.
- Brady , C., & Weil , R. (2008). The Nature and Properties of Soils. 14th Edition, Prentice Hall: New Jersey.
- Bren, J. L. (2000). case study in the use of threshold measures of hydrologic loadingin the design of stream buffer strips. Forest Ecology and Management, 132, 243-257.
- Canada, A. a.-F. (n.d.). Riparian buffers. 2018, http://www.agr.gc.ca/eng/science-and-innovation/agricultural-practices/agroforestry/shelterbelt-planning-and establishment/design/riparian-buffers/?id=1344888191892 (2018).
- Connecticut River Joint Commission. (2005). Introduction to riparian buffers . Riparian Buffers for the Connecticut River Valley,, no.1.
- Daum , D. (1996). Soil compaction and conservation tillage. Conservation TillageSeries 3:. U.S. Department of Agriculture: Agricultural Research Service
- DERM. (2009). What causes streambed erosion. Queenslan : Department of Environmnet and Resources Management .
- DID. (2009). River Sand Mining Management Guideline . RIVER SAND MINING MANAGEMENT: Department of Irrigation and Drainage (DID).
- Draggan , S. (2008). Encyclopedia of Earth. Sand and gravel. Washington DC. EPA Sabah. (2011). Guideline for Minimising Impacts Sand Mining on Quality of
- Specific Rivers in Sabah . Sabah: Ministry of Tourism, Culture and Environment Kota Kinabalu, .
- FAO. (2012). The Harmonized World Soil Database based viewer software. Food and Agriculture Organization of the United Nations (FAO).
- Fischer, , F. A., & Fischenich, J. C. (2000). Design Recommendations for Riparian Corridors and Vegetated Buffer Strips. . Vicksburg, MS., US Army EngineerResearch and Development Center, 17.
- Grade , R. J. (2006). River Marphalogy . Roorkee : New Age International Publisher .
- Graham, , M., & De Winnaar , G. (2009). Developing guidelines to determine appropriate buffers for the protection of freshwater wetlands from various landuse impacts in Kwazulu-Natal . (Draft): 1-24.

Scanned with CamScanner

- Hawes , E., & Smith, M. (2005). Riparian Buffer Zones: Functions and Recommended Widths. Yale School of Forestry and Environmental Studies.
- Hill , L., & Kleynrans , J. C. (1999). Authorisation and Licensing of Sand Mining/Gravel Extraction, in terms of Impacts on In-stream and RiparianHabitats. Journal of Mining Science, 15, 17-19.
- HManyiwa , T., & Dikinya, O. (2013). Using universal soil loss equation and soil erodibility factor to assess soil erosion in Tshesebe village, north east Botswana. African Journal of Agricultural Research, Vol. 8(30), pp. 4170-4178.
- Jontos, R. (2004). Vegetative buffers for water quality protection: an introduction and guidance document. Connecticut Association of Wetland Scientists White Paper on Vegetative Buffers., Draft version 1.0. 22pp.
- Kondolf, M. G., Smeltzer, M., & Kimball, L. (2001). Freshwater Gravel Mining and Dredging Issues. Washington Departments of Fish and Wildlife. Olympia: Ecology, and Transportation,.
- Leopold, , B. L., Wolman , M. G., & Miller, P. J. (1964). Fluvial processes in Geomorphology, W. H. Freeman and Company. United States of America.
- Mckergow, A. L., Weaver, M. D., Prosser, P. I., Grayson, B. R., & Reed, A. E. (2003). Before and after riparian management: sediment and nutrient exports from a small agricultural catchment, Western Australia. Journal of Hydrology,270, 253-272.
- MEFACC. (2016). Sutainable Sand Mangement Guide Line. New Dehli: Ministry of Environment, Forest and Climate Change Govenment of India.
- Mwangi , S. (2007). Management of River Systems in East Africa. Nairob: Macmillan. Naiman, J. R., Decamps, , H., & Mcclain, E. M. (2005). Riparia. Ecology, Conservation, and Management of Streamside Communities,. Elsevier Academic Press, Burlington, Ma. Naiman, R.J. & Décamps, H. (1997) the Ecology of Interfaces: RiparianZones. Annual Review of Ecology and Systematics, **28**, 621-658.
- Nalluri, C., & Featherstone, E. R. (2001). Civil Engineering Hydraulics. Blackwell Sceince,.
- Palone, , S. R., & Todd , H. A. (1997). Chesapeake Bay riparian handbook: A guide for establishing and maintaining riparian forest buffers. USDA Forest Service.
- Rassam, W. D., Fellows , S. C., De Hayr , R., Hunter,, H., & Bloesch, P. (2006). Thehydrology

Scanned with CamScanner

of riparian buffer zones; two case studies in an ephemeral and a perennial stream. Journal of Hydrology, 325, 308-324.

- Rinaldi , M., Surian , N., Comiti , F., & Bussettini , M. (2013). A method for the assessment and analysis of the hydromorphological condition of Italian streams: the Morphological Quality Index (MQI). Geomorphology , 180–181:96–108 .
- Rinaldi , M., Gurnell, A. M., Gonza lez del Ta nago, M., Bussettini, M., & Hendriks,
- D. (2016). Classification of river morphology and hydrology to support management and restoration. Aquat Sci , 78:17–33.
- SEPA. (2010). Engineering in the water environment: good practice guide Sediment management.
- Stebbins , M. (2006). Can Gravel Mining and Water Supply Wells coexist. Maine: University of Maine.
- Trimble, , R. G., & Sartz, , S R. (1957). How far from a stream should a logging roadbe located. Journal of Forestry, 55, 339-341.
- USGS. (2004). Determination of Channel-Morphology Characteristics, BankfullDischarge, and Various Design-Peak Discharges in Western Montana. Reston, Virginia: U.S. Geological Survey
- Vidon, G. P., & Hill, R. A. (2004b). Landscape controls on the hydrology of stream riparian zones. Journal of Hydrology, 292, 210-228.
- Welsch, D. J. (1991). forest buffers: function and design for protection and enhancement of water resources. USDA Forest Service, Northeastern Area,Radnor,, PA. NA-PR-07-91.
- Wenger , S. (1999). A review of the scientific literature of riparian buffer width, extent and vegetation. Institute of Ecology, University of Georgia. Athens, GA
- Wischmeier , W., Johnson, C., & Cross , B. (1971). A soil erodibilitynomograph forfarmland and construction sites. Soil Water Conser., 26:189–193.

Scanned with CamScanner