EXECUTIVE SUMMARY

TITLE OF PROJECT

This executive summary presents an overview of the main findings of the Environmental Impact Assessment (EIA) Report for Establishment of Frozen Potato French Fries making unit of **"M/S Rafiq Farm Foods Pvt. Ltd.".** Main objective of said project is to meet the growing demand of Frozen French Fries and to ensure local provision and export of high quality frozen fries.

As per the statutory notification of Review of Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) Regulations, 2000 made under Section 12 of Punjab Environmental Protection Act, 1997 (Amended 2012), The project for the Establishment of Frozen French Fries making unit of "M/S Rafiq Farm Foods Pvt. Ltd." falls under ***Schedule II,*** *(List of projects requiring EIA),* ***Category B*** *(Manufacturing and Processing) and* ***Sub category 4*** *"Food processing industries including sugar mills, beverages, milk and dairy products with total cost of Rs. 100 million and above"*. For this instance, Environmental Impact Assessment of the Project has been conducted in accordance with the Punjab Environmental Protection (Amendment) Act, 2012 and IEE/EIA Regulations 2000.

The main objectives of this EIA are to establish baseline environmental conditions, identify potential impacts and suggest suitable mitigation measures for the execution of the said project. This study has been accomplished in line with the provisions – guidelines and directives of Punjab Environmental Protection Agency. The process for conducting environmental assessment and the results of EIA are described in this document.

LOCATION OF PROJECT

Frozen Potato French Fries making unit of "M/S Rafiq Farm Foods Pvt. Ltd." will be located at 6 km, Qabula Road, Arifwala, District Pakpattan. Coordinates of site are 30.247413, 73.061495. Access to project site is provided by Qabula Road.

NAME OF PROPONENT AND ORGANIZATION PREPARING THE REPORT

Mr. Saleem Khalid Rafiq through M/s Rafiq Farm Foods Pvt. Ltd. is the proponent of the Project. Details of proponent are given in following table:

Proponent Details	
Proponent Name	Mr. Saleem Khalid Rafiq
Address	Farid Town, H. No. 16-A, Sahiwal
Contact No.	0300-8691177

In order to comply with the regulatory requirement of environmental laws of Punjab, management of M/s Rafiq Farm Foods Pvt. Ltd has entrusted M/s EHS Services with the assignment of carrying out an EIA Study of the said project. The details of the consultant are as follows:

Consultant Details	
Consultant	EHS Services Pvt. Ltd.
Address	House No.#12, Street No.#06, V-Lane Cavalry Ground Extension, Lahore Cantt
Focal Person	
Name	Engr. Muhammad Asif
Contact No.	0304-4404111, 0345-3122696

BRIEF OUTLINE OF PROJECT (Details are given in Chapter 5)

The said project is Establishment of Frozen Potato French Fries making unit having total plot area of 251685 sft. Total cost of project is approximately PKR 50 crore. Capacity of project is to process 2 ton/hr of frozen French fries. Complete plant of frozen French fries production will be supplied by **Levati Food Tech.** Salient features of project are given below:

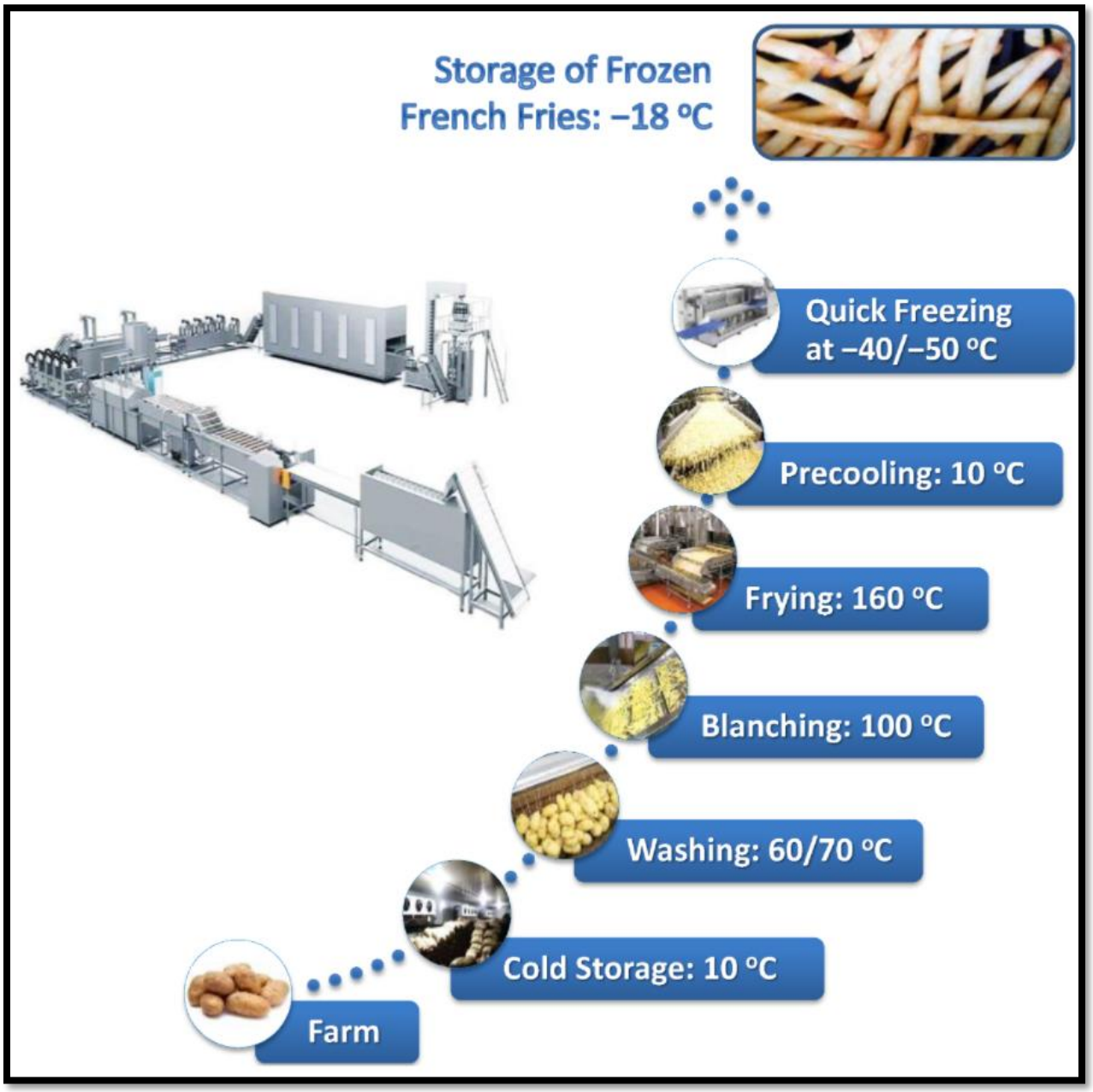
SALIENT FEATURES OF PROJECT

Proponent Name:	Mr. Saleem Khalid Rafiq
Project Title:	Establishment of Frozen Potato French Fries making unit of "M/S Rafiq Farm Foods Pvt. Ltd."
Project Location:	6 km, Qabula Road, Arifwala, District Pakpattan 30.247413, 73.061495
Consultant Name:	EHS Services Pvt. Ltd.
Capacity:	2 ton/hr
Cost of Project:	Approx. 50 crore
Area of plot:	251685 sft
Nearby Industry:	Shahid Rice Factory (0.4 km)
Nearest Hospital	Sabir Hospital (3.26km)
Source of Power:	WAPDA and generator of 1000KW
Wastewater:	Only domestic and washing water
Solid Waste:	Can be used as animal feed

The industrial batch production process of French quick-frozen fries is as follows:

- ✓ **Drum preliminary screening:** In order to remove mud, small rocks and other debris in the field, the newly unearthed potatoes have to go through a preliminary drum screening before being sent to the processing plant.
- ✓ **Potato size selection:** The washed potatoes go through a vibrating grid conveyor belt, and the small ones are shaken onto the conveyor belt below. The potatoes with different sizes are divided into two conveyor belts.
- ✓ **Washing and peeling:** potatoes are cleaned and peeled by a potato washing and peeling machine.
- ✓ **Manual screening**: Manual screening of rotten bad potatoes and potatoes that have not been completely peeled.
- ✓ **Cutting French fries:** The peeled potatoes enter the slicer and are cut into small grids of French fries, then fall into the water-containing assembly line and transport to the rinsing line.

- ✓ **Rinsing:** The cut fries enter the high-pressure bubble cleaning machine to rinse the mucus on the surface. Before fries, the fries should be soaked in water for a while to remove the starch, so that they will not be oxidized and discolored by the air
- ✓ **Blanching:** The cleaned French fries are blanched in the blanching machine to inactivate the oxidase in the fries, prevent color deterioration and accelerate dehydration.
- ✓ **Water cooling at room temperature:** Transport the blanched French fries to a conventional washing machine for cooling at room temperature.
- ✓ **Vibration draining:** After pre-cooling, the French fries enter the vibrating drainer to remove excess water.
- ✓ **Frying:** Put French fries into oil at 187 degrees Celsius for pre-frying
- ✓ **De-oiling:** The French fries that have just come out of the pan still carry oil, and the oil on the French fries is drained through a special conveyor belt with holes.
- ✓ **Quick-freezing:** After pre-cooling, the quick-freezing is carried out by a quick-freezing machine. The quick-freezing temperature is controlled below -36 degrees to ensure that the core temperature of the potato product drops to below -18 degrees within 18 minutes.
- ✓ **Packaging:** Control the weight scale of the weighing pan, and automatically enter the packaging funnel. The quick-frozen potato products should be quickly bagged and boxed.


Storage of Frozen
French Fries: –18 °C
Quick Freezing
at –40/–50 °C
Precooling: 10 °C
Frying: 160 °C
Blanching: 100 °C
Washing: 60/70 °C
Cold Storage: 10 °C
Farm

MAJOR IMPACTS AND RECOMMENDED MITIGATION MEASURES:

In order to identify all the activities associated with the project during construction and operation phase with potential to cause adverse environmental impacts and harm a thorough review has been conducted. Project will not have any significant adverseimpacts on the nearby community and on environment. Overall the project will have positive impacts on the local population and country as a whole.

Table 0-1-1: Summary of Environmental Impacts during Construction Phase

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 nuisance to the surrounding workers.**	PEQS for Ambient Air	✓ Sprinkling of water on dusty tracts and surfaces is recommended; ✓ Use of wind shield around stockpiles is recommended; ✓ Vehicle speed restrictions should be applied in the project area; ✓ Raw materials should be transported in covered trucks; ✓ Ensuring that no stockpile is within 250m of the community.

Construction Noise- **Disturbance to surrounding communities due to operation of construction machinery at the project site.**	PEQS for Noise	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. ✓ Ear muffs and ear plugs are recommended in case of high noise levels.
Solid waste Management— **Improper waste management may generate health and aesthetic issues**	Generation of excessive waste; Recyclable waste and reusable waste	✓ 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 purposes**	Unnecessary or excessive removal of trees and shrubs	✓ Minimization of the felling of trees and clearing 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 can affect 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 contaminate the soil**	Presence of visible amount of hydrocarbon in soil	✓ Provision of spill prevention and control kits; ✓ Use of impermeable surfaces in storage areas;
Socioeconomic Issues Workers Safety— **Safety hazards associated with the construction activity, particularly with the increase in traffic 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 injury or loss	✓ Speed limit of 10km/h will be maintained on the access road; ✓ night driving will be kept to a minimum

Table 0-1-2: Summary of Environmental Impacts during Operation Phase

Potential Impact	Criteria for determining Significance	Key Mitigation Measures

Air Emissions- **Gaseous emissions from boiler and generators, transportation vehicles can result in deterioration of ambient air quality of the outdoor environment.**	PEQS for Ambient Air	✓ Dual fuel boiler will be used in French Fries Processing. Fuel will be gas and wood. Boiler equipped with cyclones and wet scrubber will be used to control emissions in case if wood is used as fuel. ✓ Regular monitoring and preventive maintenance of generator and regular tuning and servicing of boiler will be carried out. ✓ Water sprinkling system shall control dust emission on the unpaved access roads ✓ Tree plantation will further control air pollution and shall improve air quality ✓ Ensure that all vehicles as well as generator are well maintained and regularly tuned to reduce the air pollution.
Discharge of wastewater- **The discharge of untreated wastewater can be a negative impact.**	Washing wastewater	• A water management strategy will be developed to ensure minimal water use during washing process; hence volume of discharge will be minimum. • Follow good housekeeping practices with potato line machinery that may potentially discharge wastewater.

		• Wastewater will be used in own agricultural land. • A Septic Tank will be installed to treat municipal wastewater.
Solid waste management- **Improper solid waste management may cause health problems and aesthetic issues**	Trims, peels and under-graded sticks	Solid waste of said unit can be used as o Animal feeding o Production of potato flakes, potato gnocchi, dumplings etc. o Production of Hash Brown or similar
Health & Safety Issues- **different operational activities at the project site may cause health and safety issues for workers if precautionary measures will not be adopted.**	OSHA Standards	✓ Proper training of workers and staff should be conducted to avoid the accidents. ✓ Use of PPEs should be implemented at workplace. ✓ First aid measures/medical facility should be provided at the project site. ✓ Safe drinking water must be provided to workers. ✓ Safety signs & boards should be placed

ENVIRONMENTAL MANAGEMENT PLAN & PROPOSED MONITORING:

For effective implementation and management of mitigation measures, an Environmental Management Plan has been prepared. The EMP provides a delivery mechanism to address potential impacts of project activities, to enhance project benefits and to introduce standards of good practice in all project activities. The EMP has been prepared with the objective of:

- Defining legislative requirements, guidelines and best practices that apply to the project;
- Defining mitigation/ monitoring plan required for avoiding or minimizing potential impacts assessed by the EIA;
- Defining roles and responsibilities of the project proponent and the contractor;
- Defining requirements for environmental monitoring and reporting;
- Defining the mechanism with which training will be provided to the project personnel.
- Environmental sensitivities and impacts, as well as the associated mitigation plan have been addressed in the EMP.

An Environmental Management Plan (EMP) has been prepared and provided in report, providing:

- A systematic approach to ensure that mitigation strategies prepared in this EIA are implemented during project activities.
- An appropriate monitoring plan is devised to ensuring strict adherence to the environmental mitigation and control measures.
- A training program is devised to providing awareness training on all potential environmental issues of the project to all personnel at site.
- A waste management plan, identifying the most suitable waste disposal and pollution control options throughout the project lifecycle.

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*** Monitoring of water quality should be conducted on quarterly basis 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

CONCLUSION

This EIA contains description of the project, description of the environmental baselines, potential environmental impacts and suggested mitigation measures. It is concluded in this study that all potential environmental concerns associated with the project have been adequately addressed, and no further study is required in this context. This report further draws the conclusion that the impacts identified are easily manageable and reversible, no long-term impact is expect and no deterioration or consequential depletion of local natural resources is expected. It is accordingly recommended that Environmental Approval for the project should be issued by the Punjab Environmental Protection Agency, subject to payment of the requisite scrutiny fee by the proponents of the project.

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INTRODUCTION

This chapter includes the data relevant to the undertaking of the Environmental Impact Assessment (EIA) and details of the project title, project proponent, Consultants, the rationale of the project and the approach taken to the EIA study.

1.1 PROJECT BACKGROUND & OVERVIEW

Potato (Solanum tuberosum L) is one of the most popular food commodities, globally sharing a major part of diet either as fresh potato or in the processed form. About 50 percent of potatoes grown worldwide are freshly consumed. The rest is processed into different potato food products and ingredients, feed for animals and birds, starch for industry, and as seed potato. The processed form includes fried, pre-fried and frozen, baked, dehydrated, and other miscellaneous products such as alcohol, organic acids, boiled and peeled, canned, and mashed. With the technological advancement's potato processing is growing rapidly and driven by the market. Globally, the potato utilization trend is also shifting towards the processing and value addition instead of fresh consumption. Till now worldwide mainly frozen French fries and chips/crisps constitute a major proportion of value-added potato products market. As per CIP report the world's appetite for factory-made French fries has been put at more than 7 million tons a year. According to the IMARC report, in 2018, the global frozen finger chips market was worth US$ 20.4 Billion with the compound annual growth rate (CAGR) of 3.7% during 2011-2018

Potato is a perishable commodity and cannot be preserved longer in fresh form. Although for some time potatoes can be preserved by low temperature storage but this low temperature storage results in many undesirable biochemical changes in the quality of the potatoes. Another alternative for the preservation of potatoes is to conversion in the shelf stable value-added processed products. Further, value-addition and processing of potato will also ensure the availability of wholesome, safe, nutritious, and acceptable food to consumers throughout the year along with simultaneous reduction in post-harvest losses and profit to the farmers for their produce. Potatoes are processed into a great variety of products, including cooked potatoes, parfried potato strips, French fries, potato chips, potato starch, potato granules, potato flakes and dehydrated diced potatoes and others.

Globally, only two potato-based snack foods i.e., chips/wafers and French-fried potato are the main value-added products of potato, accounting for more than 42% of the potato based processed products. Such type of fried products is loved for convenience and their premium taste, flavour, and texture. With the technological advancements, now potato processing is highly industrialized and market driven. Like other processed products, the finished product quality of potato based value-added products severely depends upon the quality of raw potatoes used.

French fries are among the highest viable potato products all around the world and are traditionally produced by cutting potato strips from fresh potatoes which are then deep fat fried. In the French fry industry, five global players, three North American and two European, have an estimated share of about 75% of the global French fry production. Being fried in oil French fries are generally high-calorie food and provide some beneficial nutrients such as minerals and vitamins. Like potato chips, French fries are also fat-rich high energy food. On an average 100 g of full fried French fries can provide 312 kcal of energy, 3.43 g protein, 14.73 g of fat, 41.44 g carbohydrates, 3.8 g total dietary fiber, 0.3 g sugars and 1.85 g of ash. However, this composition can vary depending upon the quality of oil used and frying time-temperature.

French fries are traditionally produced by deep frying of fresh potato strips. Generally, French fries are prepared and sold as par-fried frozen product. Commercially three major kinds of French Fries are produced (1) deep-frozen completely fried, suitable for oven heating (2) deep-frozen partially fried strips, require additional frying before consumption; and (3) refrigerated partially fried strips with short shelf-life and need additional frying.

For any project to be initiated in Punjab, it is mandatory to accord Environmental Approval from EPA Punjab under Section-12 of the Punjab Environmental Protection (Amendment) Act, 2012 by filing an IEE or EIA before EPA Punjab, as may be defined in Review of IEE/EIA Regulations, 2000 or recommended by EPA Punjab. This Report presents the Environmental Impact Assessment for the Establishment of Frozen Potato French Fries making unit of "M/S Rafiq Farm Foods Pvt. Ltd." at 6 km, Qabula Road, Arifwala, District Pakpattan. For this purpose the proponent has decided to engage environmental consultants, **M/S EHS Services** to conduct Environmental Impact Assessment (EIA) for the Establishment of project. The purpose of this study is to identify the environmental baseline i.e. physical, biological and socio-economic/cultural

conditions and assess all possible impacts arising during the construction and operation phase of the project and to find out appropriate measures for their mitigation, to either eliminate those impacts or to bring them to acceptable level and formulation of Environmental Management Plan (EMP) for implementation of the project in environment friendly manner.

This report is prepared by critically examining of the environmental factors which might be affected due to construction and operation of the project. The purpose of this report is to analyze impacts of the project. This EIA provides the basis for a determination of the degree of the environmental impacts of the project.

The report provides relevant information, as required under the officially approved format, to help the decision makers i.e. EPA Punjab before issuing for the Environmental Approval.

1.2 IDENTIFICATION OF THE PROJECT AND PROPONENT

1.2.1 Nature of Project

The Environmental Impact Assessment (EIA) report covers the project for the "Frozen Potato French Fries making unit of "M/S Rafiq Farm Foods Pvt. Ltd.". The salient features of this project have been described in Chapter 5, and briefly in Executive Summary of EIA.

1.2.2 Area/Size of project

The unit will have a capacity to make 2tons/hr fries. Said Frozen Potato French Fries making unit will have total plot area of 251685 sft. Area distribution is given below:

Table 1-1: Area Distribution

Total area of plot	**251685sft**
Covered area of production hall	37369sft
Covered area of cold storage	33327sft
Covered area of G.L office block	5255sft
Covered area of F.F office block	5255sft
Covered area of G.F gate office	511sft
Covered area of G.F staff colony	3764sft
Covered area of G.F panel and transformer	1499sft
Covered area of G.F generator hall	1801sft
Covered area shed	11200sft

Total covered area	99981sft
Open area of plot	161705sft

1.2.3 Location of the Project

Frozen Potato French Fries making unit of "M/S Rafiq Farm Foods Pvt. Ltd." will be located at 6 km, Qabula Road, Arifwala, District Pakpattan. Coordinates of site are 30.247413, 73.061495.

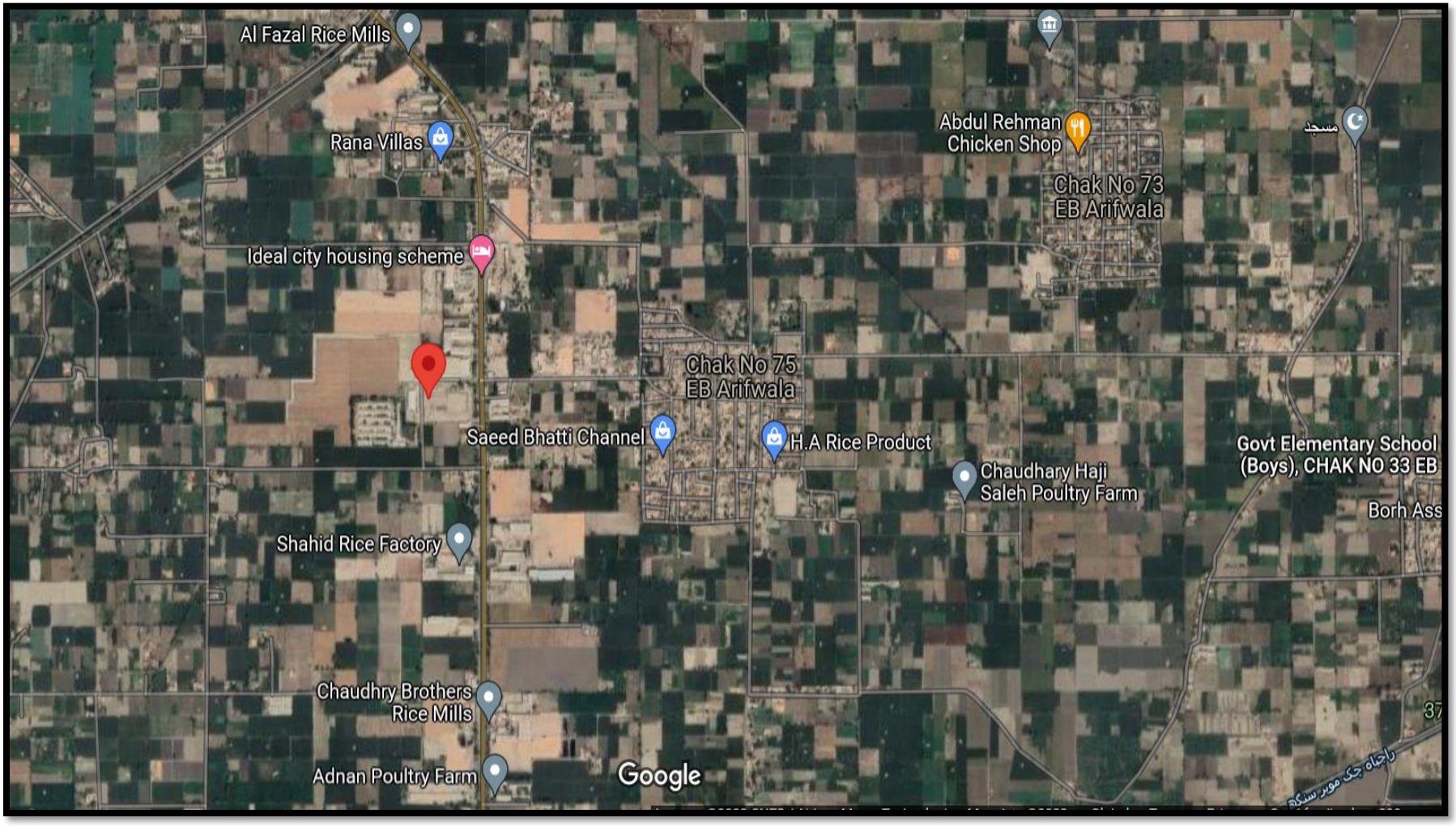


Figure 1-1: Location Map

1.2.4 Proponent

Mr. Saleem Khalid Rafiq through M/s Rafiq Farm Foods Pvt. Ltd. is the proponent of the Project. Details of proponent are given in following table:

Proponent Details	
Proponent Name	Mr. Saleem Khalid Rafiq
Address	Farid Town, H. No. 16-A, Sahiwal
Contact No.	0300-8691177

1.3 Details of Consultants

For the preparation of the EIA Report of the said project, the proponent has hired the services of the environmental consultants; **M/S EHS Services.** Team comprising of environmental engineers, chemical engineers, environmental experts and environmentalists has worked on this report. EHS Services is one of the pioneers Environmental Consultancy Companies in Pakistan with an unrivalled reputation for providing expert, tailored services and solutions. EHS Services provides the environmental services, litigation and consultancy to clients both industry and government.

EHS Services is providing quality services in various environmental sectors i.e.

- Environmental Assessment Reports i.e. IEE/EIA
- Environment Management Plans (EMP)
- Designing of Emission Control Equipment
- Waste Water Treatment Plant (WWTP) Designing
- WWTP Construction Supervision, Commissioning and Operations
- Establishing Bottled Water Plant based on RO or UF
- Lab testing (Drinking Water & Waste Water Analysis , Soil Analysis, Sludge Testing, Petroleum/ Lube Oil Testing, Fertilizer Analysis, Pesticides in Water, Soil, Fertilizer, Coal, Coke Analysis)
- Monitoring and inspection
- Environmental modeling

Consultant Details	
Consultant	EHS Services Pvt. Ltd.

Address	House No.#12, Street No.#06, V-Lane Cavalry Ground Extension, Lahore Cantt
Focal Person	
Name	Engr. Muhammad Asif
Contact No.	0304-4404111, 0345-3122696

Study team:

The following table lists the names of experts involved in the making of EIA report:

Table 1-2: List of Experts

Sr. #	Name	Qualification	Role
Engineers			
i.	Engr. M. Asif	M.Sc. Chemical Engineering	Monitoring and Testing
ii.	Engr. Muzna Manzoor	M.Sc. Environmental Engineering	Designing and report review
iii.	Engr. Fahad Nazir	M.Sc. Chemical Engineering	Socioeconomic Survey
iv.	Engr. Rida Azhar	B.Sc. Environmental Engineering	Report preparation
v.	Mahtab Alam	M.Sc. Chemical Engineering	Collection of baseline data
vi.	Saad Khattak	B.Sc. Chemical Engineering	Site survey and analysis of impacts on surroundings

1.4 PURPOSE OF EIA

The establishment/development/construction of any Project leads to positive and adverse changes in environmental and change in social settings of the Project Area. The intensity and level of change, however, depends upon the nature of the Project and the baseline environmental conditions of the area. The development of said project will cause minor to moderate adverse environmental and social impacts on the surrounding area. Thus, an environmental and social study is mandatory to establish the baseline conditions, evaluate the possible adverse impacts if any, and devise the mitigation measures.

Section 12 of Pakistan Environmental Protection Act, 1997 (PEPA, 1997) states "No proponent of a project shall commence construction or operation unless he has filed with the Provincial Agency an Initial Environmental Examination (IEE) and, where the project is likely to cause an adverse environmental effect, an Environmental Impact Assessment (EIA), and has obtained approval from the Provincial Agency in respect thereof." Later on, Punjab Environmental Protection Agency (Review of IEE and EIA) Regulations, 2000 provided the guidelines for categorizing the Projects. According to Schedule-II of PEPA (Review of IEE and EIA) Regulations, 2000; the construction of the said project falls under category B (4). i.e., the project requires an EIA study.

1.5 OBJECTIVES OF EIA

The main objectives of this EIA study were:

- ✓ To determine and document the state of the environment of the project area to establish a baseline in order to assess the suitability of the said project in that area.
- ✓ To identify pre-construction, construction and operation activities and to assess their impacts on environment.
- ✓ Provide assistance to the proponent for planning, designing and implementing the project in a way that would strengthen environment, improve ecological resilience, eliminate or minimize the negative impact on the biophysical and socio-economic environment and maximizing the benefits to all parties in cost effective manner.
- ✓ To present Mitigation and Monitoring Plan to smoothly implement the suggested mitigation measures and supervise their efficiency and effectiveness.

- ✓ To provide opportunity to the public for understanding the project and its impacts on the community and their environment in the context of sustainable development.
- ✓ Prepare an EIA Report for submittal to the Environmental Protection Agency, Punjab for according Environmental Approval.

1.6 Approach & Methodology

The following approach and methodology was adopted for carrying out the EIA study of the proposed project:

1.6.1 Approach for EIA

The approach for conducting EIA of said Project is to follow the requirement of Punjab Environmental Protection Act 1997, Initial Environmental Examination and Environmental Impact Assessment Review Regulations 2000 and the guidelines provided in the Pakistan Environmental Assessment Procedures, 1997

1.6.2 Orientation

Meetings and discussions were held among the members of the EIA Consulting Team. This activity was aimed at achieving a common ground of understanding of various issues of the study. Subsequent to the concept clarification and understanding, a detailed data acquisition plan was developed for the internal use of the EIA consulting team. The plan identified specific data requirements and their sources; determined time schedules and responsibilities for their collection; and indicated the logistics and facilitation needs for the execution of the data acquisition plan.

1.6.3 Desktop Studies

Prior to mobilization, the consultants conducted a desktop study through collection and review of guidelines, data and reports related to the proposed project, that included (a) review of National and Provincial Environmental Legislations; (b) Google Earth Satellite Imagery; (c)) and other relevant documents/drawings and design data provided by the Client.

1.6.4 Review of Environmental Laws and Institutional Requirements

All applicable national and international laws, legislations, guidelines along with relevant international protocols were reviewed relevant to the proposed project components.

1.6.5 Delineation of Study Area / AOI

For an EIA Study, a clear delineation of the Study Area / Area of Influence (AOI) is required. Study Area / AOI is the area within which the potentially significant impacts of the proposed Project activities (direct or indirect) are envisaged. In this report, the Study Area / AOI is the area where the Project impacts has been accessed on the environment due to the proposed Project activities. Based on the available Google Earth Imagery, Project footprints were overlaid on the existing Project Area Imagery. Utilizing the information collected through the detailed site visit, consultations with the locals and concerned departments and foreseen impacts of the proposed Project, a tentative AOI was delineated.

1.6.6 Survey of AOI

A team of Environmental Scientists, Environmental Engineers and Sociologist carried out the environmental and social survey of the AOI to familiarize themselves with the local conditions and the environmental settings. During the survey, the information regarding the topography, soils, surface water, groundwater, flora & fauna, social settings and major settlements along the AOI were observed.

1.6.7 Environmental Baseline Survey of the Project

Detailed environmental and social survey was carried out within the AOI as mentioned above. For data collection, formal meetings were held and data collected through visual observations, interviews with the local residents and officials. In order to collect the relevant published information, government offices were also visited. Prior to the start of field activities comprehensive checklists, proformas and maps were developed to collect the information

1.6.8 Stakeholder Consultations

The Consultant identified Project stakeholders and held meetings with them during the surveys to receive feedback on the expected environmental issues related to the Project and suggested mitigation measures. Meetings were carried out with stakeholders to discuss the issues/constraints and get their views and feedback to mitigate the potential environmental as well as social impacts associated with the implementation and operation of the Project.

1.6.9 Screening of Potential Environmental Impacts and Mitigation Measures

Based on the generally established baseline conditions in the adjacent as well as in the Project Area, potential physical, ecological and social impacts of the proposed Project were identified, evaluated and quantified, wherever possible. A logical and systematic approach was adopted for impact identification and assessment by utilizing a combination of the secondary data, satellite imagery, environmental checklists, socioeconomic survey proformas, field observations and discussion with the local residents of the Project Area. To mitigate the significant adverse impacts, adequate mitigation measures and implementation framework were proposed so that the proponent could incorporate them beforehand in the design phase.

1.6.10 Environmental Management Plan (EMP)

An EMP has been prepared to ensure the adequacy and effectiveness of the proposed protocol by clearly identifying the roles and responsibilities of the agencies, responsible for implementation, monitoring and auditing of EMP activities, existing and suggested framework, necessary approvals and the required further studies. EMP also include organizational setup, a monitoring mechanism, monitoring plan, environmental and social parameters to be monitored with their frequency. Similarly, costs for environmental monitoring and social component/social mitigation measures were also included as part of the EMP. Environmental monitoring, evaluation, auditing and reporting mechanism were also proposed in the EMP.

1.7 STRUCTURE OF REPORT

This EIA reviews information on existing environmental attributes of the Study Area. Geological, hydrological and ecological features, air quality, noise, water quality, soils, social and economic aspects and cultural resources are included. The report predicts the probable impacts on the environment due to the said project. This EIA also proposes various environmental management measures. Details of all background environmental quality, environmental impact/pollutant generating activities, pollution sources, predicted environmental quality and related aspects have been provided in this report. The structure of the assessment report will be as follow;

Section 1 "Introduction" briefly presents the project background, objectives, methodology and need of the EIA study.

Section 2 "Description of Project and Alternative" furnishes information about the studied alternatives, location of the proposed project, cost and size of the project, its major components and alternatives considered for the proposed project to select at the preferred alternative for detailed environmental assessment.

Section 3 "Environmental Baseline" describes physical, biological and socio-economic conditions prevalent in the project area.

Section 4 "Public Consultation" identifies the main stakeholders and their concerns raised through scoping sessions, and deals with the measures to mitigate the social impacts.

Section 5 "Anticipated Environmental Impacts and Mitigation Measures" identifies and evaluates impacts of the project activities during the construction and operation stages and recommends with the measures proposed to mitigate potential environmental impacts of the road project.

Section 6 "Environmental Management Plan" outlines roles and responsibilities for the implementation of the proposed mitigation measures, training needs of the staff for implementation of the mitigation measures, monitoring requirements, monitoring cost etc.

Section 7 "Conclusion and Recommendations" elaborates the conclusion of subject environmental study and suggests the recommendations to address the issues raised from proposed construction activities.

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 effect an Environmental Impact Assessment (IEE) and has obtained from the Government Agency approval in respect thereof."

As per the statutory notification of Review of Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) Regulations, 2000 made under Section 12 of Punjab Environmental Protection Act, 1997 (Amended 2012), The project for the Establishment of Frozen French Fries making unit of "M/S Rafiq Farm Foods Pvt. Ltd." falls under ***Schedule II,*** *(List of projects requiring EIA),* ***Category B*** *(Manufacturing and Processing) and* ***Sub category 4*** *"Food processing industries including sugar mills, beverages, milk and dairy products with total cost of Rs. 100 million and above"*. For this instance, Environmental Impact Assessment of the Project has been conducted in accordance with the Punjab Environmental Protection (Amendment) Act, 2012 and IEE/EIA Regulations 2000.

SCOPING

3.1 INTRODUCTION

The scoping identifies the key issues and impacts that should be further investigated. The Scoping defines the spatial and temporal boundaries, important issues and concerns raised during consultation and significant impact factors to be determined.

3.2 OBJECTIVES

The key objectives of this scoping are to:

- ✓ Inform the public about the proposed project
- ✓ Identify main stakeholders and their concerns and values
- ✓ Define reasonable and practical alternatives to be addressed
- ✓ Focus the important issues and significant impacts to be addressed in the EIA report
- ✓ Define the boundaries in time, space and subject matter
- ✓ Set requirements for the collection of baseline and other information
- ✓ Establish the Terms of Reference (TOR's) for the EIA study

3.3 SPATIAL AND TEMPORAL BOUNDARIES OF ENVIRONMENTAL ASSESSMENT

Project site is open land yet. Construction of said project will be completed in 5 to 6 months. Operation Lifespan will be more than 25 years.

Said project will have positive and negative impacts at local and national level. The establishment of the said project will contribute to enhancing Pakistan's domestic productivity, and help diversify Pakistan's economy. It will create potential of improvement for social and cultural values of local people's exchange of values and standards through positive social interactions. Positive changes in lifestyles will occur due to availability of income when the natives take up Company jobs.

Within 2km radius of project site, various industries are present. So the said project will not cause significant negative impacts as it is to be located near other industries and agricultural farms. No environmental sensitive area is present that could be impacted due to the current project.

3.4 Important issues and concern raised during consultation

During consultation it was observed that maximum of people was in favor of project and following issues and concerns were raised during Stakeholder Consultation:

- Air emissions and noise should be controlled effectively.
- Locals should be preferred for the job opportunities.
- Solid waste should be managed effectively by adopting the standard practices of the area.
- Cleanliness of the area should be ensured.
- Waste should not be dumped openly.
- Health of the workers should be ensured.
- Workers should be hired from local community.
- Environmental enhancement measures such as; Tree plantation, monitoring and safety should be ensured
- HSE plan should be enforced strictly
- Preventive measures should be adopted to avoid any unfortunate incident
- Proponent shall work for betterment of community
- All emissions and effluents shall be managed properly to avoid public nuisance
- Latest/State of the art technology must be adopted.

3.5 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
- Community impacts
- Control Air emissions
- Job opportunities for locals
- Confined noisy activities
- 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

ALTERNATIVES

4.1 General

This chapter deals with an analytical overview of the different alternatives that have been considered during the development of strategic development plan of proposed project. The following alternatives were considered during the study:

- Location/Site Alternatives, their selection and rejection criteria.
- Design/Technology Alternatives, their selection and rejection criteria.
- Environmental Alternatives, their selection and rejection criteria.
- Economic Alternatives, their selection and rejection criteria.

4.2 Site Alternatives

No site alternatives were considered as the project is located in an area surrounded by cluster of industries and proponents own agricultural farms. So the wastewater can be used within proponents own land. The selected land is under the ownership of the owner without any dispute. There is no protected or environmentally sensitive area present in the vicinity. 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 available on-site.

4.2.1 Reasons of Site Selection

The proponent has selected this site due to the following reasons:

- Selected site is owned by proponent
- Presence of industries nearby
- Located on accessible road
- No watercourse within a safe distance
- No ecologically sensitive or declared protected area within 10 km of the selected site

Areal distances of site from nearest receptors are as follows:

Receptors	Name	Distances

Residence	Ideal City	1km
Educational institute	Army Public School	1.2km
Hospital	Sabir Hospital	3.26km
Industry	Shahid Rice Factory	0.4km
Road	Qaboola Road	0.1km

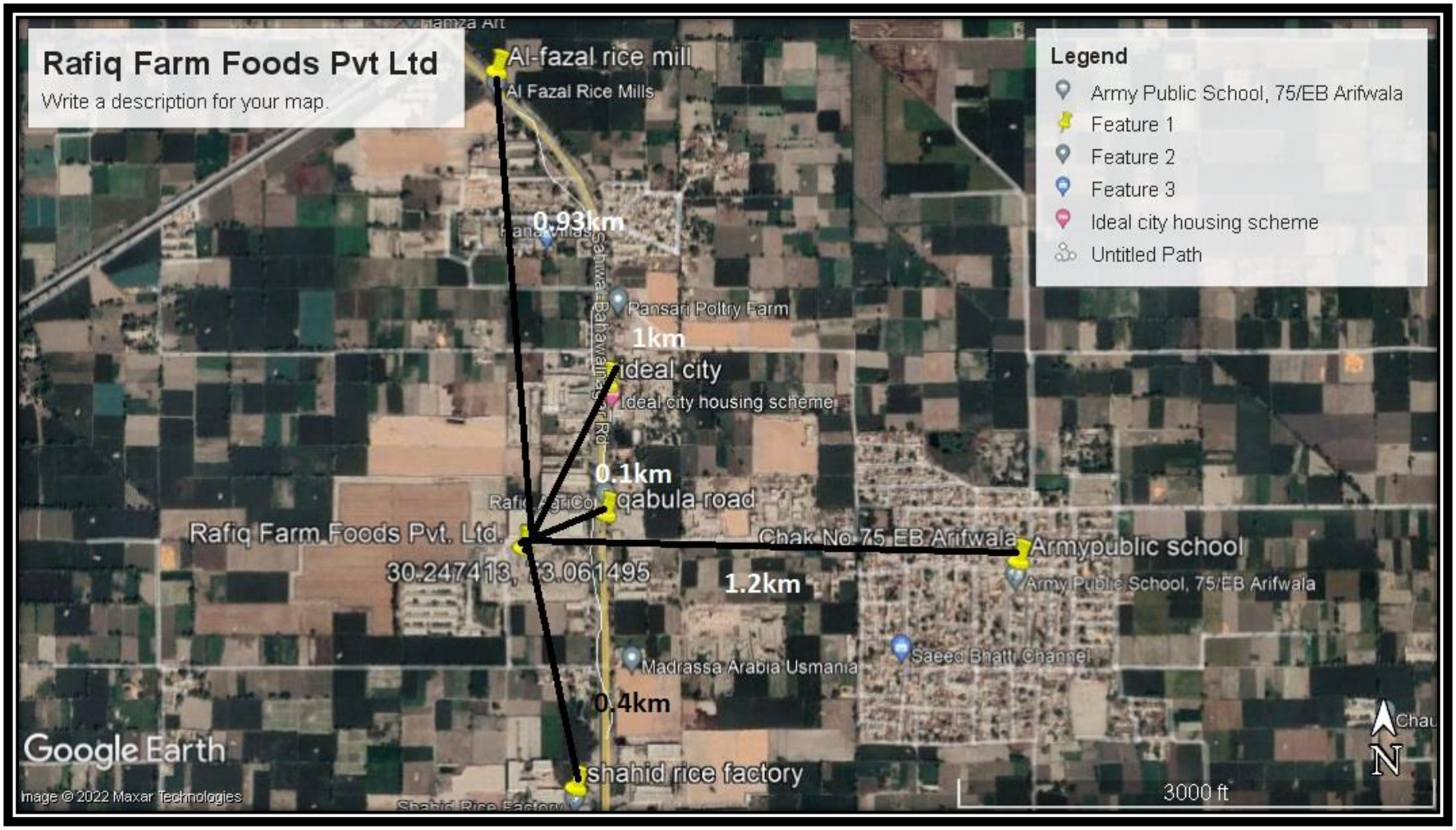


Figure 4-1: Nearest Receptors

4.3 Process/Technology Alternative

In said project, French fries line will be equipped with condensate recovering system. Higher potato yield is obtained with the condensate recovering system. A discharge valve will be provided to remove the steam condensate continuously from the peeling vessel. This special feature together with the possibility to peel with a higher steam pressure allows the peeling time to be reduced down to 60 seconds.

4.4 Environmental Alternative

The unit site is located in an area which is devoid of any biodiversity including forestry, wildlife, migratory birds, game reserves (flora and fauna), or protected species of fauna & flora; fishery or aquatic biology; watershed. There is no cultural or any other heritage in the project area. Summarily, there is no environmental sensitivity in the project area. These factors are also strongly supportive of the proposed project site.

4.5 Economic Alternative

Selected land is under ownership of proponent and no cost is required to purchase other land so it is viable and economic option for proponent to construct frozen fries unit.

DESCRIPTION OF THE PROJECT

5.1 GENERAL

This section covers the project comprehensively. It holds salient features; including location, project site layout, objectives, alternatives, cost and magnitude of operation and various phases.

5.2 OBJECTIVES OF THE PROJECT

Main objectives of said project are:

- To meet the growing demand of Frozen French Fries
- To ensure provision of high quality frozen fries
- To facilitate in bridging the gap between producer and consumer
- Create new employment opportunities as a part of the project activities scope

5.3 LOCATION & LAYOUT OF PROJECT

5.3.1 Location of the Project

Frozen Potato French Fries making unit of "M/S Rafiq Farm Foods Pvt. Ltd." will be located at 6 km, Qabula Road, Arifwala, District Pakpattan. Coordinates of site are 30.247413, 73.061495.

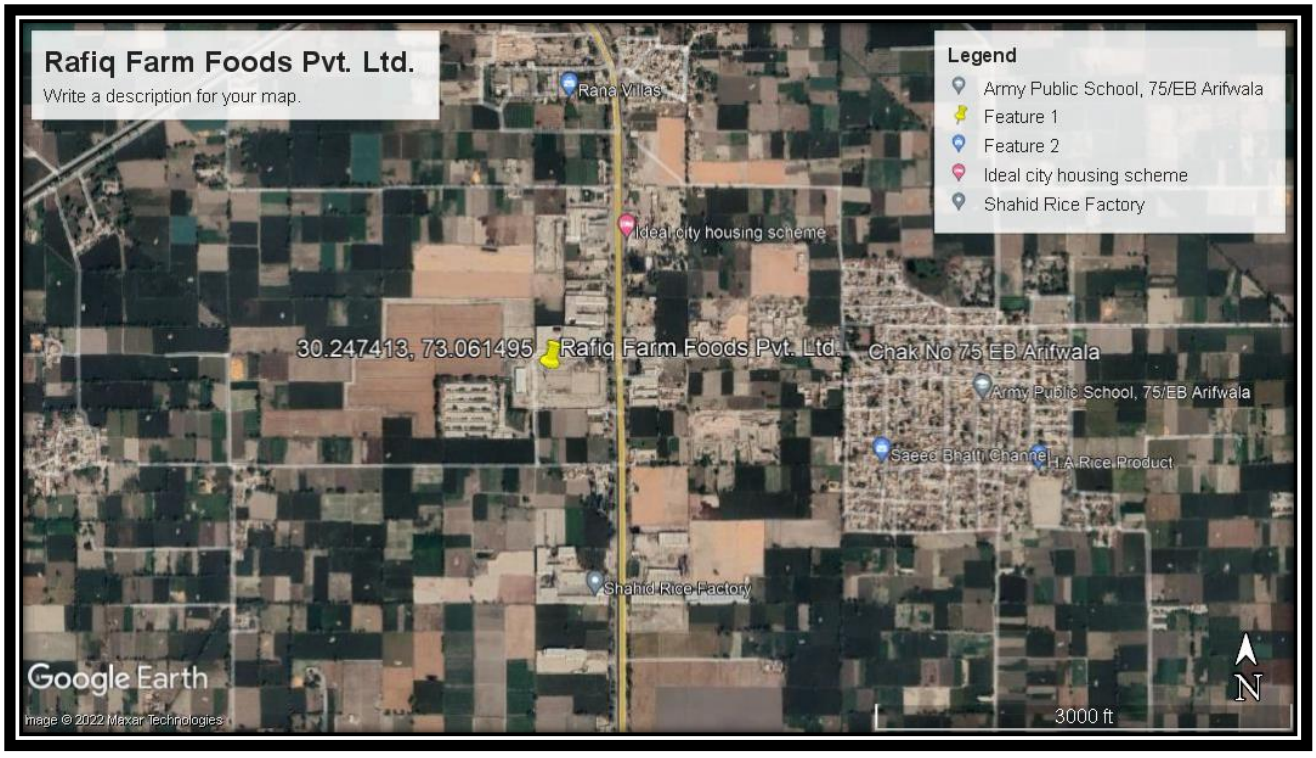


Figure 5-1: Location Map

5.3.2 Layout of the Project

TMA Approved Layout map of the project site is attached with the report as Annexure III.

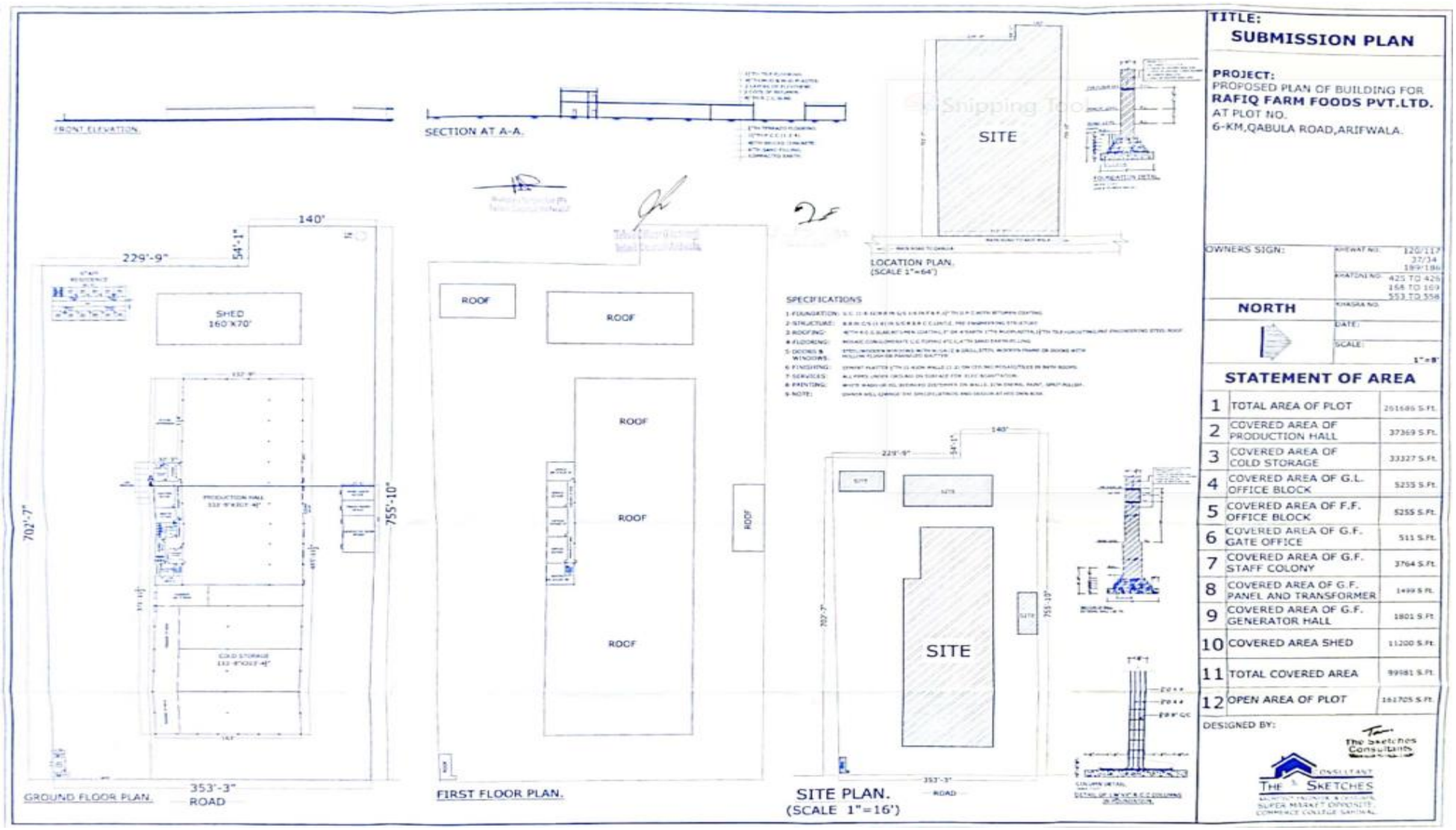


Figure 5-2: Layout Map of Project

5.4 GOVERNMENT APPROVALS

TMA approved map is attached with the report as Annexure III.

5.5 LAND OWNERSHIP & LAND USE

The land is owned by the owner of this project without any dispute. The nearby area is agricultural cum industrial in nature. Said area is surrounded by industries and agricultural areas. Site is open land yet, no construction has been done

5.6 ROAD ACCESS

Said project site is easily accessible through Qaboola Road. Road Network around project site is shown in below fig:

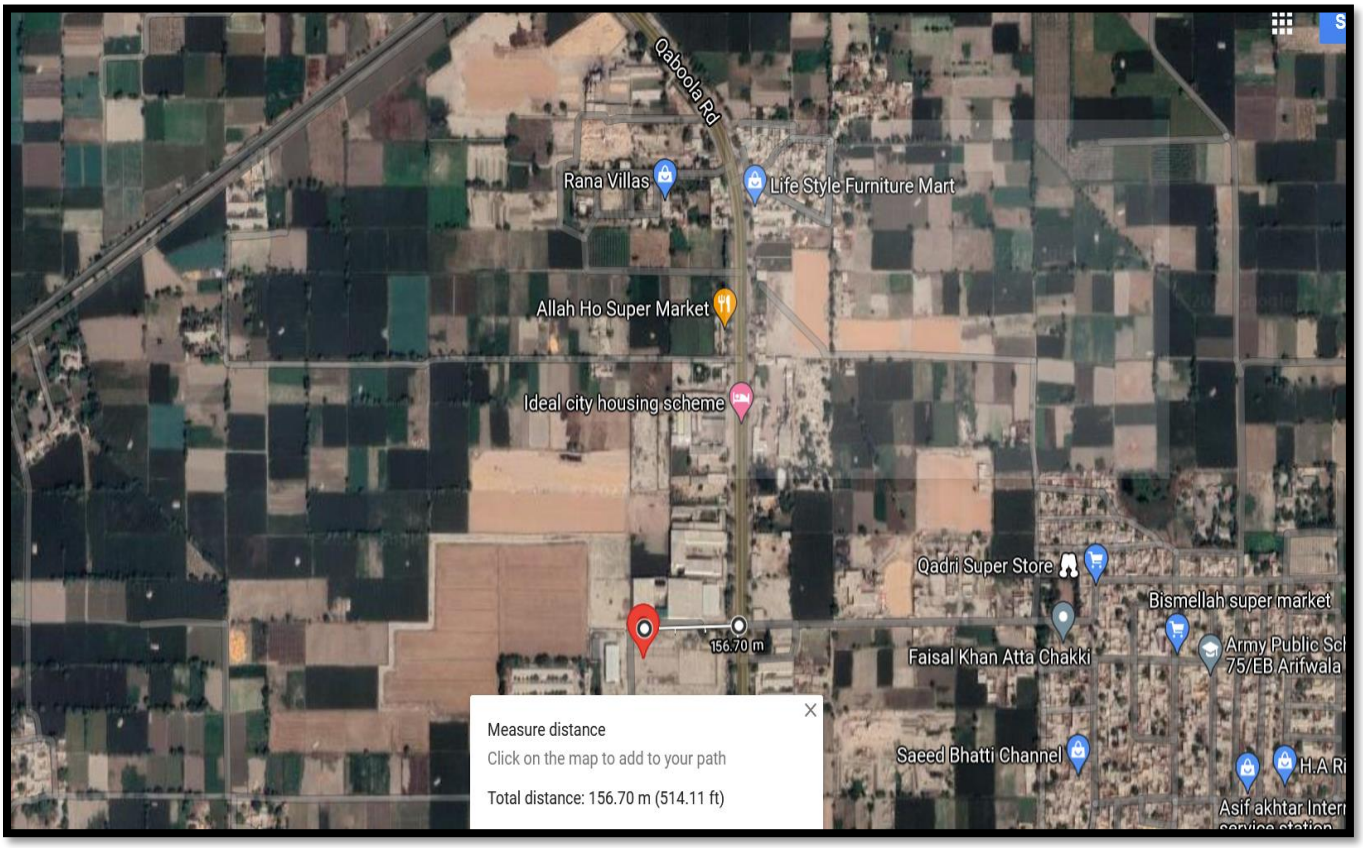


Figure 2-2: Road access to the project site

5.7 RELOCATION AND REHABILITATION PLAN

The main areas to be considered for site restoration include the construction area, temporary tracks; land used for vehicle and material stores, material excavation pits etc. These areas should be restored to its original condition with the maximum possible effort. The restoration work

comprises the removal of temporary construction works and removal of any fence installed, leveling of areas (wherever required), etc. The following procedures will be adopted for the restoration of the site:

- All temporary construction built for the site development will be removed.
- Any debris from construction activities should be removed properly from the site.
- All fencing and gates will be removed and pits will be backfilled.
- Whole of the site will be covered with the original soil to the original levels and grades and re-vegetation will be done, where required.

None of the locals or residents will be relocated or infrastructure will be affected or destructed because land is already under the ownership of the project owner. There is no need for the relocation or dismantling of significant structure. Hence, no relocation and rehabilitation is required.

5.8 VEGETATION FEATURES OF SITE

The project area is surrounded by agricultural lands. The main crops in the nearby vicinity of the project area include Jau (Barley) and Jwar (Sorghum) etc. Ber, Kikar and Shisham trees and some bushes and shrubs are present around the project site.

5.9 DESCRIPTION OF THE PROJECT

The said project is Establishment of Frozen Potato French Fries making unit having total plot area of 251685 sft. Total cost of project is approximately PKR 50 crore. Capacity of project is to process 2 ton/hr of frozen French fries. Complete plant of frozen French fries production will be supplied by **Levati Food Tech.**

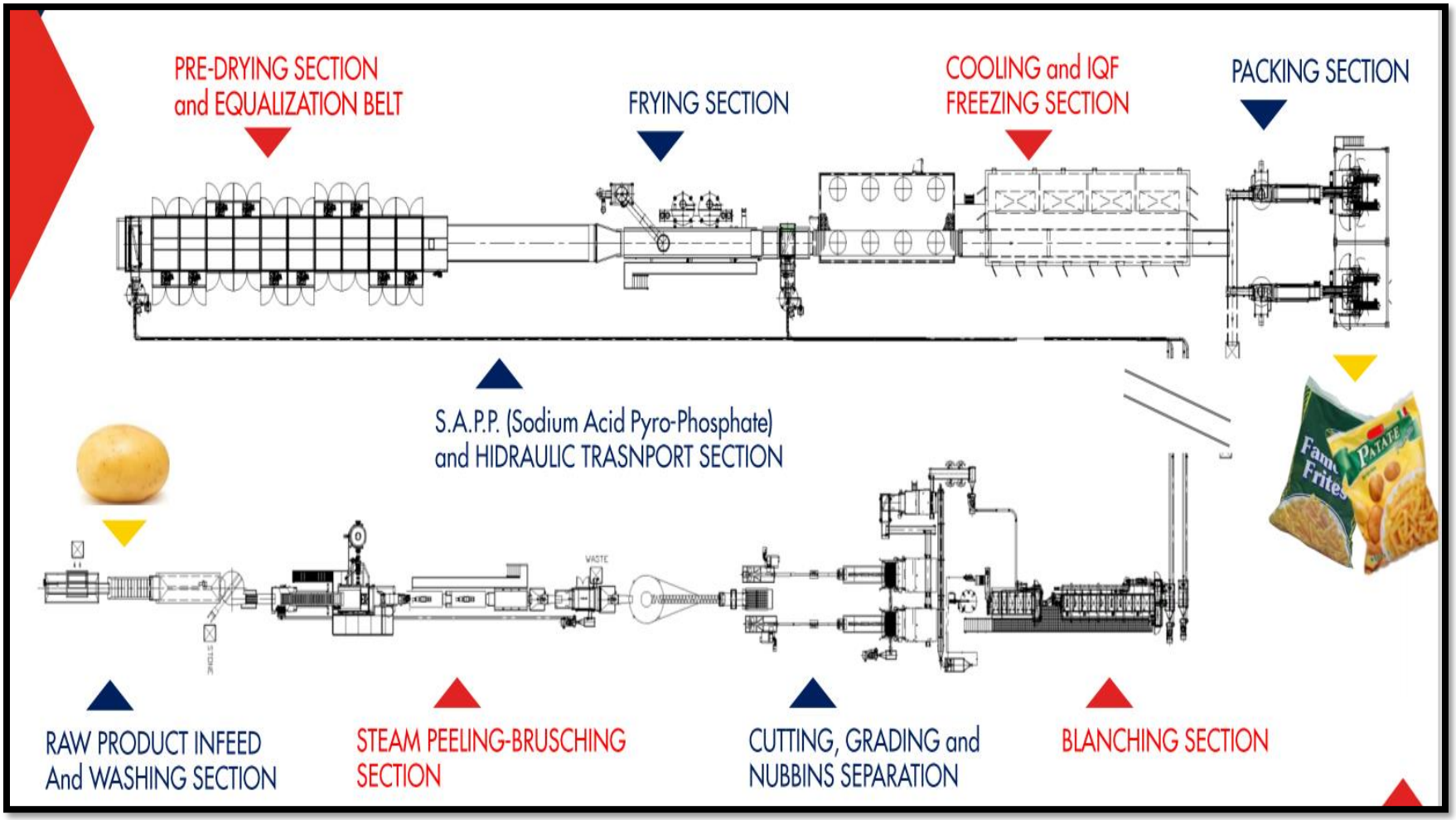


Figure 5-3: Layout of Frozen Fries Making Process

In process of preparing frozen French fried fries potatoes are peeled, trimmed, cut into fries, blanched to translucency, dehydrated to remove surface moisture, par-frying, individual quick freezing (IQF) and then corresponding packaging and storage .

5.9.1 Raw Material Selection

The properties of the potato are very important in producing idea French fries of good quality.

Size and Shape	Long or long oval tubers larger than 50mm are ideal
Moisture	Dry content of 20-24%
Reducing sugar	Not be more than 0.5%
Specific gravity	1.08 g/cm^3 or more with 1.1 preferred

Potatoes should be graded by size before putting into producing schedule. In one process, utilizing potatoes in one graded size is important. It will benefit an uniform potato fries size, consequently, allow for uniform cooking. Small potatoes are not well suited for producing French fries due to yield a high proportion of short cuts and slivers.

Figure 5-4: Potato Grader

5.9.2 Washing and Destoning

The washing machine with rotary drum has been designed to remove earth or debris from the product.

The horizontal or cyclone destoner has been designed to remove stones, iron pieces and heavy particles.

Figure 5-5: Drum Washer

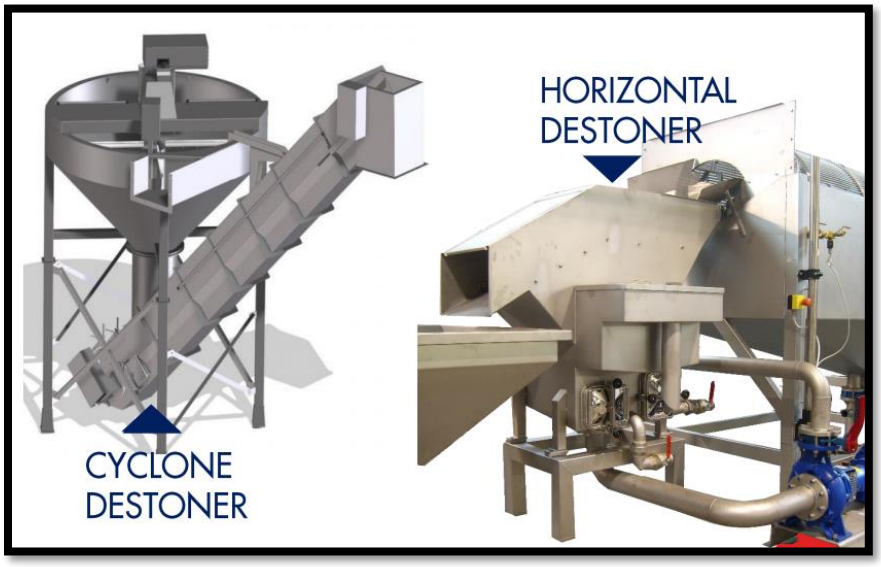


Figure 5-6: Destoner

5.9.3 Potatoes Peeling Section

Potatoes peeling is done by steam peeler. At the end of the peeling cycle the steam is discharged and therefore the pressure drops abruptly. The consequent evaporation of the water makes loose the peels around the potatoes. The potatoes are then discharged in cooling tank where the cold water stops the potatoes cooking

Figure 5-7: Potatoes Peeling Section

5.9.4 Brushing and Washing

The brusher removes peels from potatoes. The rollers with brushes are mounted on the cradle around the conveying screw. The brushes are driven by two motors with soft start. Each brush is self-cleaning and discharge the peels directly in the collecting hopper. The peels are dried in order to be used as animal feed.

5.9.5 Manual sorting

The operators remove all the bad potatoes or clean the potatoes removing the defects and release the wastes in the side pockets. The wastage are then conveyed from the return side of the belt to the feeding edge where they are collected in the wastage bin.

Figure 5-8: Manual Sorting

5.9.6 Buffer and Pre-heating

Before cutting, the potatoes have to be heated in order to make the tubers more elastic to avoid their shuttering and formation of cracks on sticks surface. During frying the edges of cracks become dark, increases the oil absorption causing oil soaked and off colored sticks.

Figure 5-9: Buffer and Pre-heating

5.9.7 Hydro Cutting (Stick or Segment)

The inclined screw elevator extract the potatoes from the holding tank. The potatoes fall in the hopper of the high pressure pump. The potatoes are shouted by the tremendous pressure against a wire mesh where they are cut length-wise

The advantages of hydro-cutting are:

- ✓ Production of extra-long sticks that are uniform in cross section
- ✓ Low give away product thanks to less production of nubbins and silvers

5.9.8 Grading (Nubbins/ Sleeve separator)

The vibrating screens separates the nubbins (short sticks). This unit is made essential by two vibrating plates, one over the other. The plates have bores with dia equal to minimum length of sticks accepted. The sticks that are shorter than the dia falls in the lower plate where they are further graded. The sticks are continuously sprayed with water to remove the exceeding starch and to ease the transport.

Figure 5-10: Nubbins Separator

After nubbins separator, sleeve separator separates sleeves (thin sticks). The sleeve separator is mainly a rollers conveyor. Each roller is lined with food grade corrugated plastic. The distance of rollers can be easily adjusted according to thickness of sticks that must be removed.

Figure 5-11: Sleeve Separator

The under-grade sticks and waste are conveyed from the recovering screw conveyor to a collecting point to be sold out for further use in market.

5.9.9 Blanching

Blanching is a processing step whereby potatoes are heated in steam or water for 2 to 3 min. This inactivates enzymes and prolongs the storage life of frozen fries. Moreover, blanching reduces the subsequent cooking time. Blanching also makes the colour more uniform after frying and it forms a layer of gelatinized starch that limits oil absorption and improves texture. The operation standard is that the potato fries are blanched until have a generally translucent throughout.

Ist stage blancher is used for enzymatic inactivation (85^0C). 2^{nd} stage blancher is used for sugar dilution (65^0C).

Figure 5-12: Blanching

5.9.10 S.A.P.P (Sodium Acid Pyro-Phosphate)

Sticks are treated in S.A.P.P dip to avoid discoloration during the drying with hot air. System is based on a water flume where sticks are submersed in water solution with additives. The system is supplied with pump to dose the solution in the water.

5.9.11 Pre-drying

The pre dryer is used to dry the sticks before the frying section. The pre dryer assures:

- ✓ Low oil absorption
- ✓ Low frying time
- ✓ Higher time of retention after the final frying

The sticks are feed at 90^0 by conveyor that assure correct distribution of the product on the pre dryer conveyor.

The % of water evaporated can be adjusted tuning the temperature and the speed of the conveyor. The air is heated two times while passing through the product.

5.9.12 Frying

The frying process is one of the most important step of the line. The sticks are partially fried for high quality product. Oil is filtered by a mechanical belt filter.

Figure 5-13: Frying

5.9.13 De-oiling

The de-oiling shaking conveyor is placed after the fryer. The exceeding oil is collected in the heated trays and pumped back to fryer.

Figure 5-14: De-oiling

5.9.14 Pre-cooling

The sticks are coming out from the fryer at a temp of 90 degree. In order to reduce the energy consumption of the freezing tunnel the product is cooled with cold air circulation in a cooling air tunnel.

Figure 5-14: Pre-Cooling

5.9.15 IQF Freezer

After the cooling tunnel the sticks are freeze at -18^{0}C (core temperature). In order to reduce energy consumption of freezing tunnel the product is cooled with ambient air. The drop between the two conveyors inside the tunnel avoid the formation of blocks of products. The air flow between the products allow a perfect freezing of the product.

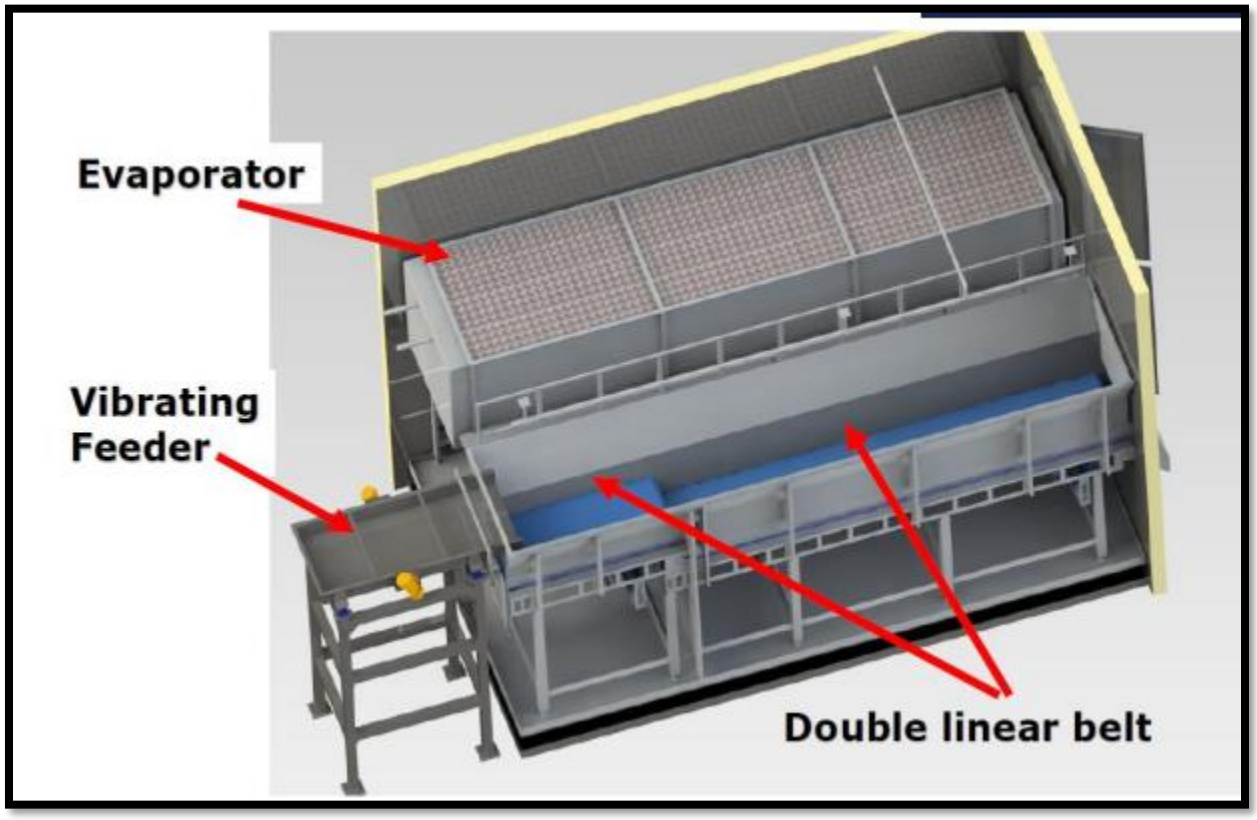


Figure 5-15: IQF Freezer

Process flow diagram of Frozen Fries Manufacturing line is given in fig below:

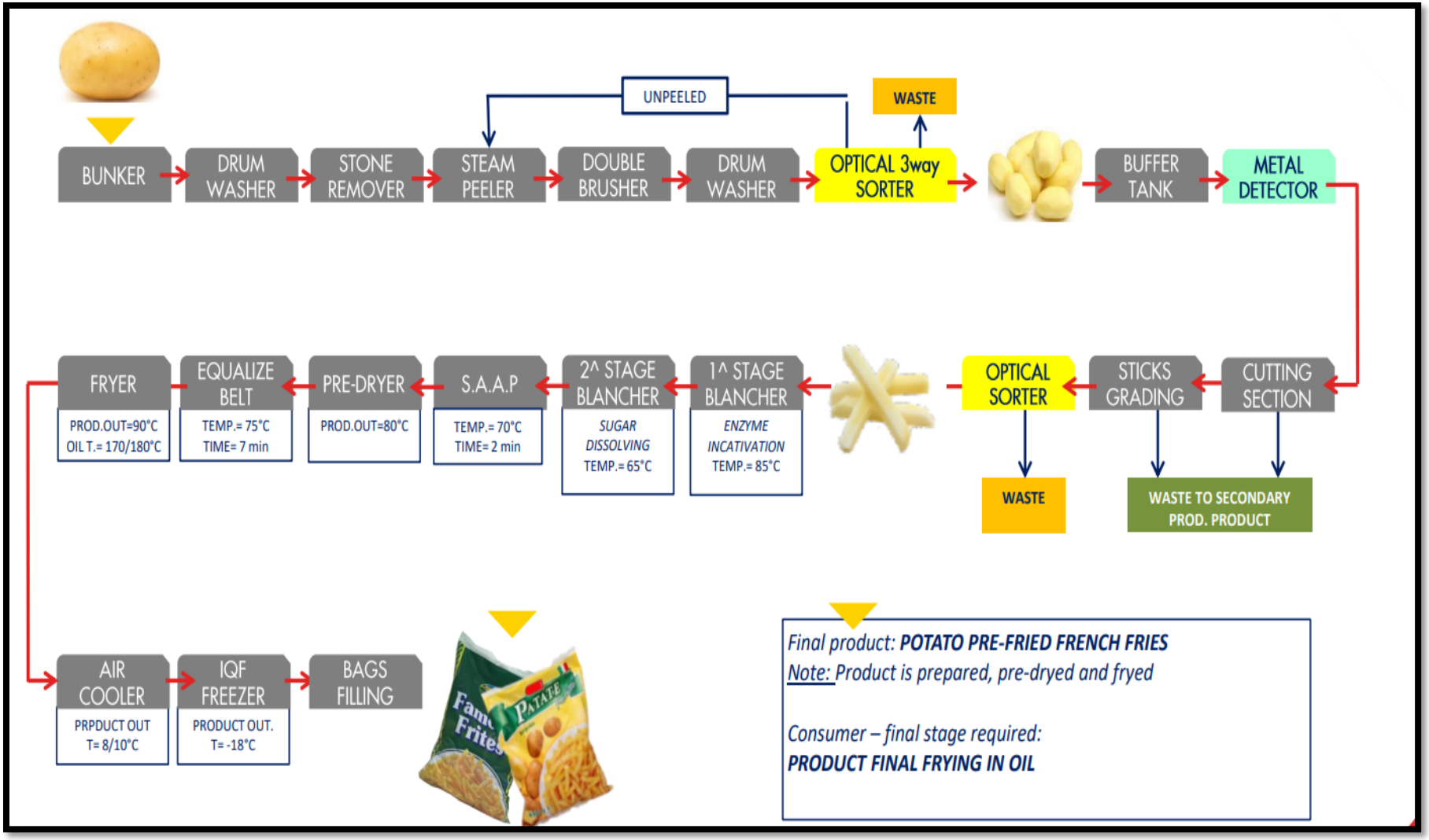


Figure 5-16: Process Flow Diagram

5.10 SUPPLIES & WASTES

5.10.1 Water Supply

During construction phase, approx. 2m^3/d of water will be required. During operation phase, the factory will require significant volumes of water in order to sustain various factory processes. This water will be required for washing and cleaning, boiler and domestic purpose. The groundwater will be utilized to fulfill the general requirement of water. The groundwater will be extracted from a depth of 200-250 ft. Domestic water requirement will be approx. 20m^3/d.

5.10.2 Power and Steam Requirement

Source of power will be WAPDA and generator of 1000KW will be installed as backup power source. Steam requirement of plant will be fulfilled through boiler of 4ton/hr capacity. Oil heater of 2000kcal will also be provided. Dual fuel boiler will be used in French Fries Processing. Fuel will be gas and wood. Boiler equipped with cyclones and wet scrubber will be used to control emissions in case if wood is used as fuel.

5.10.3 Manpower

During construction phase, 15-20 workers are required. During the operation phase of the project, the total manpower requirement is estimated to be 20 people comprising administrative, technical, and non-technical persons. These include technicians, engineers, machinery operators, accountants, administrative assistances, secretaries, etc. All recruited staff will be given appropriate training in order to educate them on the specific job tasks to be performed

5.10.4 Wastewater

Wastewater will be generated from cleaning and washing purpose besides the wastewater from the municipal activities of the workers. Approx. 20m^3/d wastewater will be generated. Municipal wastewater will pass through a Septic tank whereas washing and cleaning wastewater will be used for irrigation purposes in owned agricultural area.

5.10.5 Solid Waste

The solid waste to be generated during construction phase will consist of metal scrap from Fabrication Work and debris from construction activities. Debris will be re-used for refilling purposes whereas metal scarp is saleable item. During operation phase, potato waste including

trims, peels and under-grade sticks will be generated from French Fries Line that will be sold to vendors who make cattle feed. Solid waste of said unit can also be used as:

- Animal feeding
- Production of potato flakes, potato gnocchi, dumplings etc.
- Production of Hash Brown or similar

5.11 COST AND MAGNITUDE OF THE PROJECT

The magnitude of operation includes:

- ✓ Detailed site survey, planning and demarcation of the various regions in the project area
- ✓ Process, electrical and civil designing
- ✓ Purchase and delivery of equipment
- ✓ Civil construction
- ✓ Mechanical and electrical erection
- ✓ Testing and commissioning
- ✓ Plantation of various ecologically important species on the designated green space.

Estimated Cost of the Project will be Rs. 50 crore. Cost breakdown of project will be:

Total Cost	Rs. 50 crore
Land Cost	Not applicable
Construction Cost	Rs. 10 crore
Machinery Cost	Rs. 40 crore

5.12 SCHEDULE OF IMPLEMENTATION

Construction period of aforesaid unit is approx. 5-6 months.

Sr. #	**Activities**	**3 Months**			**3 Months**		
		1M	1M	1M	1M	1M	1M
1	Detailed Designing						
2	Construction of Unit						
3	Obtaining required approvals						
4	Installation of machinery						

5	Commissioning of project						

ENVIRONMENTAL AND SOCIAL BASELINE

6.1 GENERAL

This section covenants with the prevailing environmental conditions of the project area. Information that has been collected from different sources, including public literature, reports of other studies conducted in this area, knowledge with the proponent and the concerned government departments and the first-hand surveys and field measurements has been presented in this section. This chapter encompasses all the important aspects of local environment; such as biological resources, socioeconomic development and quality of living values.

A Social survey in the Project Area was also carried out through consultation with the various communities. Local residents living in the Project Area were interviewed to obtain their feedback regarding the construction of the said Project and its impacts on their daily life/future in the short and long term.

6.2 PHYSICAL ENVIRONMENT

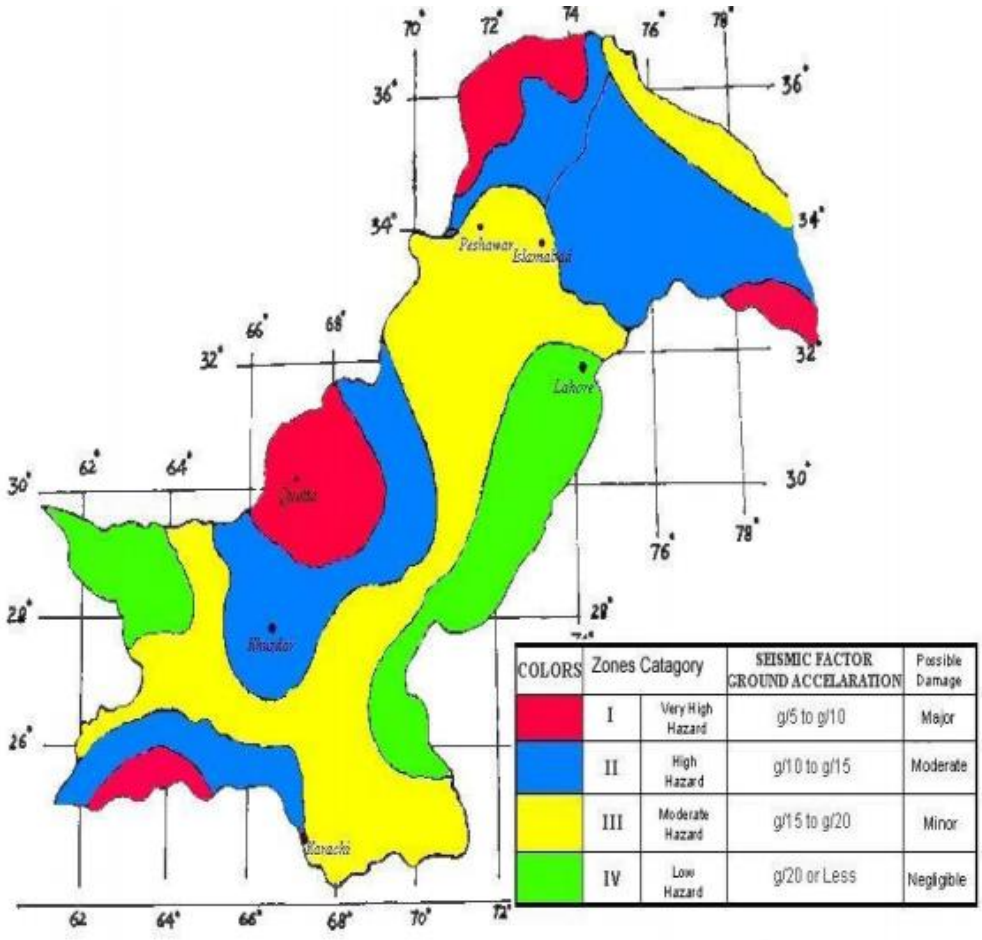
This part examines the physical resources such as topography, soil, climate, surface and ground water resources and quality, ambient air quality and geology of not only the Project site but also the city as a whole to assess whether the project under assessment can or does have any impacts on any of these parameters. The description of physical environment of project site is presented in the following sub sections.

6.2.1 Soil Types

The said Project area forms a part of the vast Indus plain, which is a part of the IndoGangetic depression. This depression is of a synclinal nature. Synclinorium depression is a fore deep downward of the Himalayan foreland of variable depth, converted into flat plains by the simple process of alluviation. The alluvial deposits are underlain by rocks of Precambrian age. The soil of the level area is generally medium to coarse texture. Bar and levees have medium to coarse material. In sub-recent flood plain the soils of the bar and levees are relatively coarser while those of channels / basin are predominantly clayey

6.2.2 Siesmicity Data

Earthquake in non-cohesive soil may cause serious problems. In extreme cases liquefaction can occur if Relative density is low Initial confining pressure (overburden) is low Earthquake intensity is high Duration of ground shaking is long National Seismic Monitoring Centre of Pakistan issued the seismic zone map for Pakistan, as shown in Figure below. Said Project area falls in low hazard area and low risk associated with the infrastructure found in this area.



COLORS	Zones Catagory		SEISMIC FACTOR GROUND ACCELARATION	Possible Damage
	I	Very High Hazard	g/5 to g/10	Major
	II	High Hazard	g/10 to g/15	Moderate
	III	Moderate Hazard	g/15 to g/20	Minor
	IV	Low Hazard	g/20 or Less	Negligible

6.2.3 Hydrology

Pakpattan canal system is the main source of the surface water within the project area. There are some seasonal nallahs which run during the monsoon period but due to lack of any collection and storage infrastructure, it is too scant and unreliable to be of any agricultural or other use. Pakpattan canal is a perennial canal and closes only for cleaning purpose. The main canal is divided into

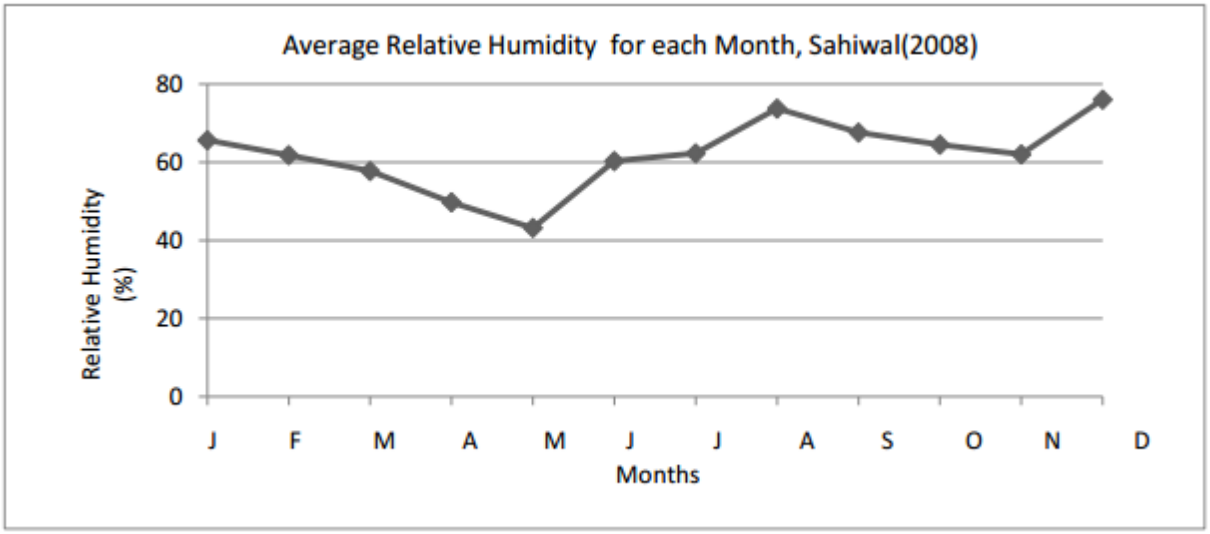
two parts; Upper Pakpattan and Lower Pakpattan canal. The Upper canal off-takes from river Sutlej at Suleimanki Barrage and Lower canal feed through SMB Link canal. M.P Link canal is another source of upper Pakpattan canal and brings about 1000 cusecs of water from L.B.D.C. Pakpattan-Islam Link canal off-take from upper Pakpattan at RD 406 and takes about 1000 cusecs of Upper Pakpattan canal water to Islam Barrage to accommodate the discharge of Upper Bahawal and Qaim Canal. The discharge capacity of the Upper Pakpattan canal at the head regulator (Suleimanki Barrage) is 6,594 cusecs.

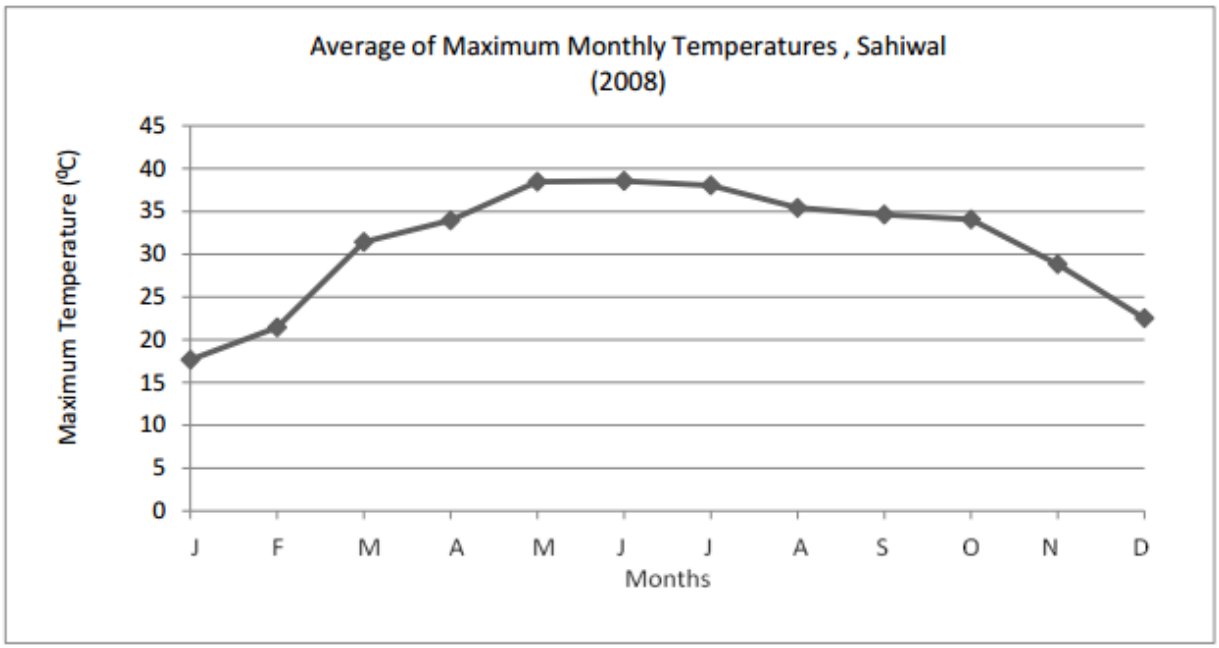
Project site:

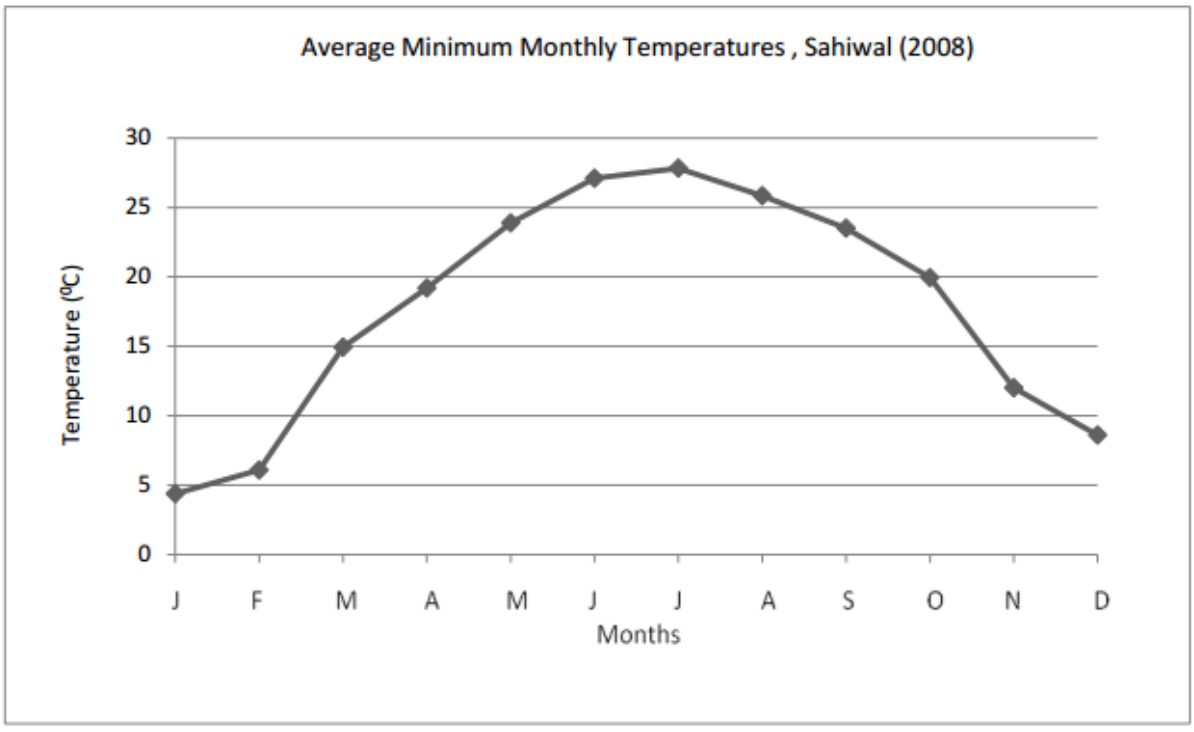
Groundwater from depth of 200-250ft can be used for drinking and other purpose. Lab reports of water quality are annexed.

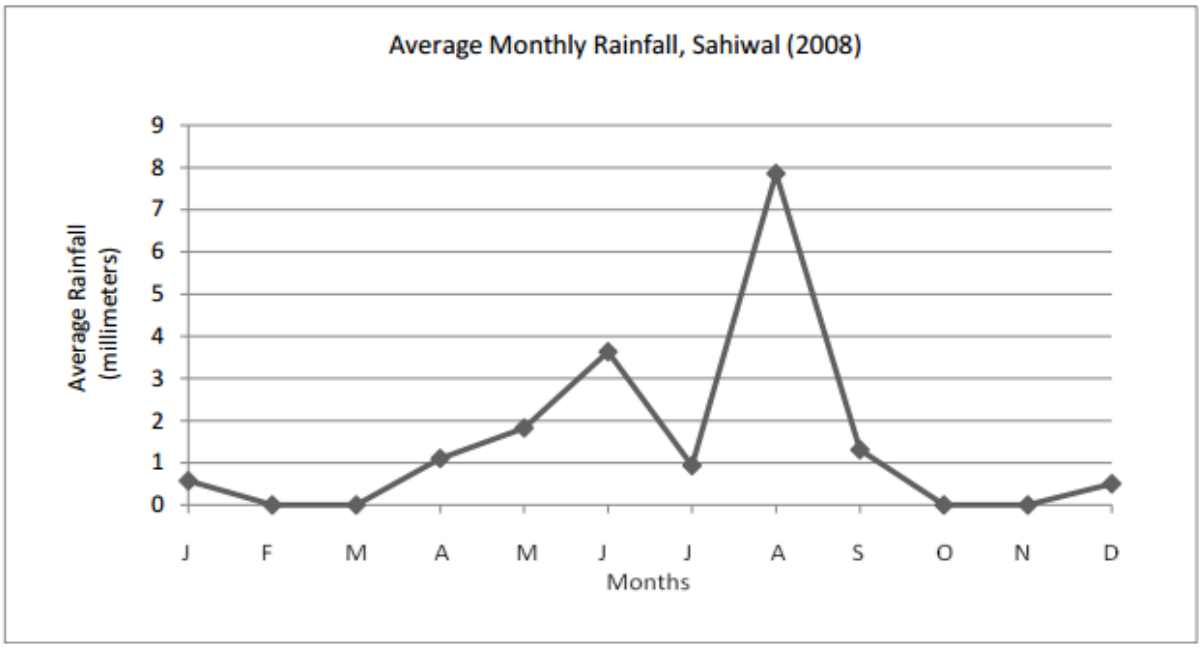
6.2.4 Climate

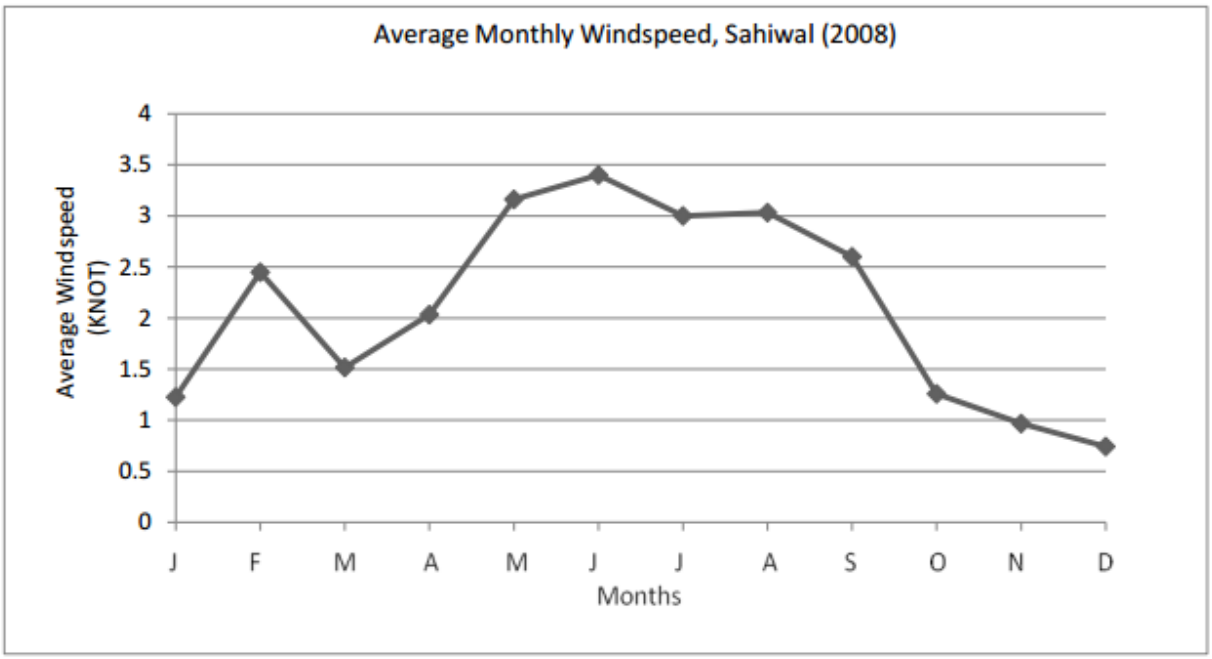
The climate of the area is arid and characterized by a long hot summer and short mild winter. The data collected from the nearest meteorological station of the project, at Sahiwal is presented in the following graphs.




Average of Maximum Monthly Temperatures , Sahiwal (2008)
Maximum Temperature (ºC)
45
40
35
30
25
20
15
10
5
0
J F M A M J J A S O N D
Months


Average Minimum Monthly Temperatures , Sahiwal (2008)
Temperature (ºC)
30
25
20
15
10
5
0
J F M A M J J A S O N D
Months





6.2.5 Ambient Air Quality

Lab reports of ambient air quality are annexed.

6.3 BIOLOGICAL ENVIRONMENT

6.3.1 Flora

Prior to canal irrigation in the Pakpattan area, wild trees such as Jand (Prosopis spicigera) and Van (Salvadora abeoides) were prominent in the region. After 1930 trees such as Shesham (Dalbergia sisoo) and Kikar (Acacia nilotica) were planted whereas in recent years, Sufaida (Eucalyptus) has also been planted in the area.

Reference: IEE of Punjab Irrigated Agriculture Investment Program, Tranche 3 — Pakpattan Canal and Suleimanki Barrage Improvement Project, August 2012

6.3.2 Fauna

About a century ago, wildlife species of the area included neel gai (blue bull), Chankara deer, Hog deer, wolves, wild cat, hyenas and leopards. But due to the development of irrigation system during 1920s and construction of new cities including Vehari, Burawala, Arifwala etc the habitats of some of these animals were distracted and they become extinct in this area. Also vigorous hunting and killing during last three to four decades eradicated some of the above species from this part of the world.

Reference: IEE of Punjab Irrigated Agriculture Investment Program, Tranche 3 — Pakpattan Canal and Suleimanki Barrage Improvement Project, August 2012

6.3.3 Protected areas / National Sanctuaries

There is no wildlife sanctuary or game reserve or any other protected area within the project area.

6.4 SOCIOECONOMIC ASSESSMENT

Socioeconomic Assessment is represented by the human and economic development and quality of life values. For the study of socio-economic environment of the project area, field surveys were conducted and interviews were held with the general public and neighbors.

6.4.1 Educational Facilities

The educational facilities available by the government are not adequate, and people have the option to send their children to private schools for education or in the nearest town(s) for higher education, which the poor parents find difficult to afford. However, people are more interested in imparting religious education to their children and happily send them to the mosques for

reading the Holy Quran through the Clergy, Imam of the mosque. This religious education is normally provided free of cost. Education facilities found in area are:

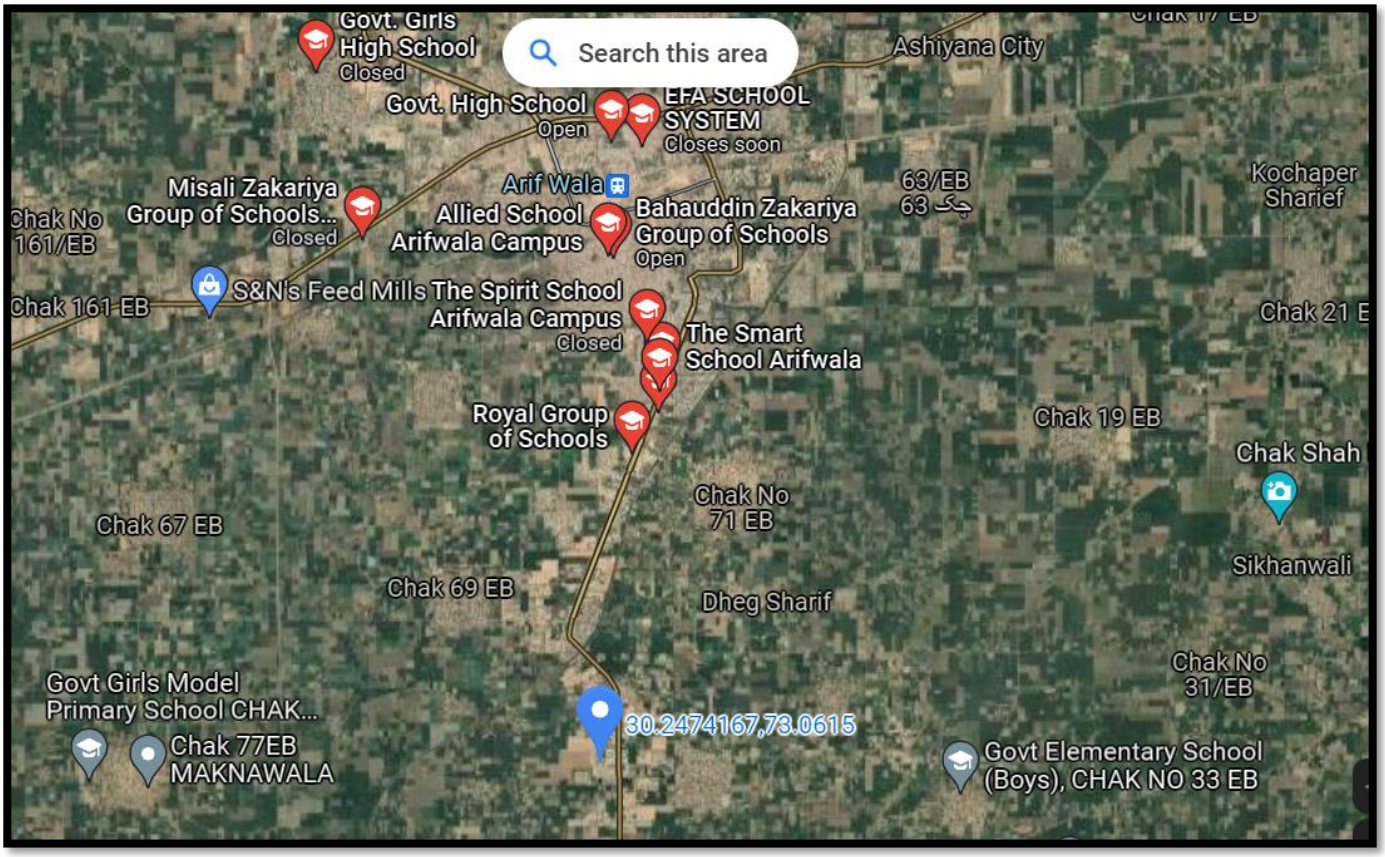
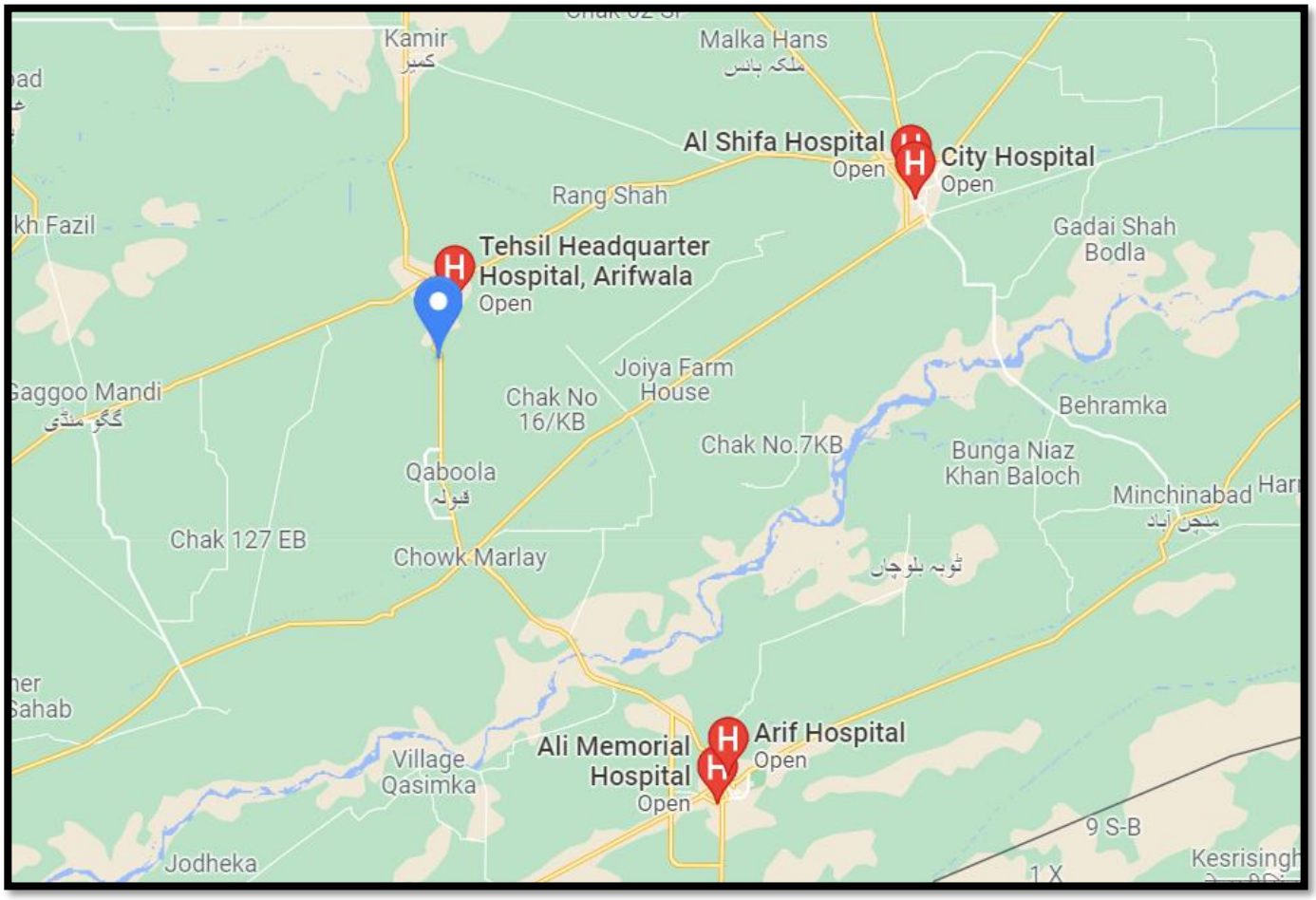


Figure 6-1: Nearby schools

6.4.2 Health facilities

Health condition is one of the major determinants of a society's social development and quality of life. The overall health condition of the residents is good in the Project Area, as no serious disease was reported by the respondents. However, few hepatitis patients were also found in the study area. The health facilities provided by the government in the Project area are very limited. Therefore, people are compelled to consult private practitioners and Hakeem etc. for their medical treatment. Health facilities present in nearby areas are:



6.5 QUALITY OF LIFE VALUES

Majority of people in project area are working in shops and some are doing jobs . The locals of proposed area are provided with basic facilities like electricity, roads, transport etc. If we talk about educational facilities then education up to primary level are available nearby. They are also provided with health facilities including dispensary and hospital where basic health facilities are provided to workers and community.

6.5.1 Social Amenities

The sample respondents were inquired during socio-economic survey about the presence of utilities in their homes to develop the social baseline of the area. A significant majority (90 percent) of the respondents have electricity, only one (1) percent has the facilities of government water supply schemes. Similarly, two (2) percent have landline telephone facilities**.**

Sr. No	Social Amenities	Frequency	%
1	Electricity	180	90
2	Water supply	1	1
3	Telephone	2	1

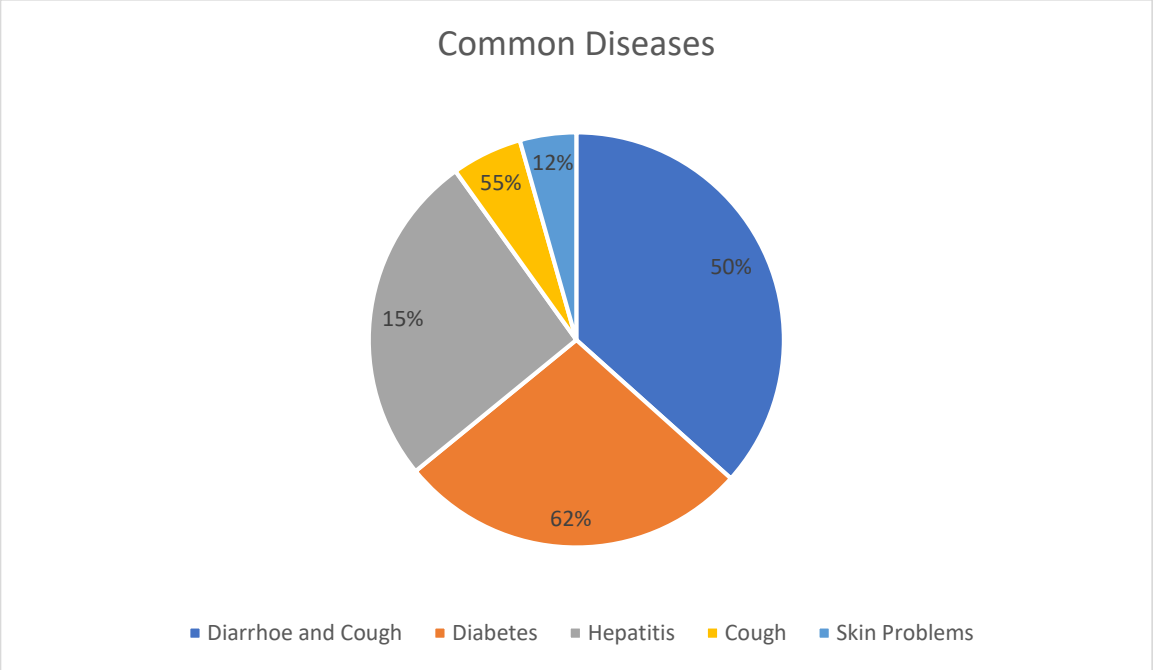
6.5.2 Occupation

The occupational /professional status of the respondents as given in table indicates that about 47 percent are farmers, and the remaining are livestock holders nineteen (19) percent, laborers twelve (12) percent, government/private employees eleven (11) percent, businessmen ten (10) percent, and student are also reported to be one (1) percent. The students are treated as unemployed.

Sr. No	Profession	Percentage (%)
1	Farmers	47
2	Livestock holders	19
3	laborers	12
4	Govt. / private employees	11
5	Businessman	10
6	Unemployed/student	1

6.5.3 Health

The non-availability of health facilities particularly affects women and children. In almost all localities, people complained that fatalities sometimes occur when patients are being transferred to hospitals in the main cities. Even the staff is inadequate at the tehsil and district level hospitals; resultantly people have to be content with the private health care facilities. However, private treatment is not affordable for the majority of the population. Common disease found in area were:



6.5.4 Education level

The most prominent issue of concern among the local population is lack of educational facilities, as they showed dissatisfaction with existing educational facilities. It becomes more difficult especially to send girls to far off places for education due to poor transportation facilities and long distance between homes and schools.

Table 6-1: Respondents Education Level

Sr. No	Education level	Percentage
1	Illiterate	59
2	Primary	12
3	Middle	2
4	Matric	11
5	F.A	6
6	B.A	8
7	M.A	1

8	M. Phil	1

6.6 LAB REPORTS OF ENVIRONMENTAL ANALYSIS

Testing of different parameters was done from a certified laboratory to check the quality of different environmental parameters. The copy of the lab reports of these parameters (ambient air analysis, water quality analysis) is given in annexure.

6.7 SITE SUITIBILITY

The proponent has selected this site due to the following reasons:

- Selected site is owned by proponent
- Presence of industries nearby
- Located on accessible road
- No watercourse within a safe distance
- No ecologically sensitive or declared protected area within 10 km of the selected site

IMPACT ASSESSMENT

7.1 General

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.

7.2 Impact Identification and Characterization

The identification of impacts is done on the basis of literature review, site surveys and expert opinion on prevailing site conditions and sensitive receptors. Characterization is done on the basis of significance, probability and prevalence of the potential impacts in the surrounding environment. To evaluate the impacts, Impact Characterization Matrix is prepared and given in Table

7.3 Significance Rating

The overall significance of the impacts is defined based on the result of a combination of the consequence rating and the probability rating. Each identified impact is analyzed in terms of magnitude, extent, duration, and probability of occurrence, the value of the affected environment and likely degree of recovery of the affected area.

Table 7-1: Impact Characterization

✓ Nature	(direct/indirect)
✓ Duration of impact	(short term, medium term, long term)
✓ Geographical extent	(local, regional)
✓ Timing	(project phase: before, during and after construction
✓ Reversibility of impact	(reversible/irreversible)
✓ Likelihood of the impact	(certain, likely, unlikely, rare)
✓ Impact consequence severity	(severe, moderate, mild).
✓ Impact significance	(High, medium, low)

Table 7-2: Environmental Impact Characterization for Project Construction Phase

Impact	Nature	Duration	Geo Extent	Timing	Reversibility	Likelihood	Consequence Severity	Impact Significance
Physical Environment								
Soil Erosion,	Direct	Short Term	Local	During Construction	Reversible	Likely	Moderate	Medium
Soil Degradation	Indirect	Short Term	Local	During Construction	Reversible	Likely	Mild	low
Air Quality Deterioration	Direct	Short Term	Local	During Construction	Reversible	Likely	Moderate	low
Surface water Contamination	Indirect	Short Term	Local	During Construction	Reversible	Unlikely	Mild	Low
Groundwater Contamination	Direct	Short Term	Local	During Construction	Reversible	Likely	Moderate	Medium
Water Consumption	Direct	Short Term	Local	During Construction	Reversible	Likely	Moderate	Medium

Biological Resources								
Loss of/Damage to Natural Vegetation	Indirect	Short Term	Local	During Construction	Reversible	Rare	Mild	Low
Loss of/Damage to Wildlife	Indirect	Short Term	Local	During Construction	Reversible	Rare	Mild	Low

Table 7-3: Environmental Impact Characterization for Project Operation Phase

Impact	Nature	Duration	Geo Extent	Timing	Reversibility	Likelihood	Consequence severity	Impact significance
Soil Contamination	Indirect	Short Term	Local	After Construction	Reversible	Rare	Mild	Low
Water Contamination	Direct	Short Term	Local	After Construction	Reversible	Likely	Mild	Low
Health and Safety	Direct	Short Term	Local	After Construction	Reversible	Likely	Moderate	Medium

Solid Waste	Indirect	Short Term	Local	After Construction	Reversible	Likely	Mild	Low
Air pollution	Direct	Short Term	Local	After Construction	Reversible	Likely	Moderate	Medium
Biological Environment	Indirect	Short Term	Local	After Construction	Reversible	Rare	Mild	Low

SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURE

8.1 GENERAL

This Chapter identifies the potential impacts (positive and adverse) on the physical, biological and socio-economic environment of project area due to proposed project. It also identifies measures that will help to mitigate the adverse environmental and social impacts (if any) and it will enhance positive impacts of the project. Impacts are assessed by analyzing their magnitude and sensitivity, which is a legal requirement

8.2 Anticipated Impacts of Project

Subsequent to the characterization, appropriate mitigation measures were identified, in order to minimize, if not completely eliminate, the adverse impacts associated with project activities. The impact characterization of the predicted impacts and mitigation measures are discussed below:

8.2.1 Project Location

The impacts associated with the project siting is those which relate to its location at the designated site. These impacts are different from those which are associated with the project's construction and operational phases. The construction and operational impacts are associated with the activities such as land clearing, waste disposal, whereas the siting impacts relate to the mere presence of a facility at the given location. Following mitigation measures will be adopted:

- The land use of project will not be changed as number of industries and agricultural fields are already present in surroundings.
- Project has been designed on sustainable basis with all utilities like water, natural gas, sewerage system, drainage and electrification.
- Energy efficient products and technologies will be used to the extent possible to provide comfort and better lighting facilities as well to cut short the energy crisis if happens in the aforesaid project.
- Grey water usage mechanism and Rainwater harvesting will be incorporated in the design to conserve water, and that can be used for horticulture purpose, thus reducing the pressure water shortage problem.
- The design of the proposed project would be adopted in a manner that minimizes the changes in the topography, landscape and damage to the natural vegetation.

8.2.2 Pre-Construction/Design Phase Impacts

Incompatible layout plan and engineering design of the project's structures can undermine the overall aesthetic beauty and ambience of the project area. Also,low utilization of the available space and not designing the structures considering, the prospective and futuristic needs can result in structures with low social acceptability and functionality. This impact will be temporary and moderate negative in nature.

Inappropriate structure may rupture during the earthquake or any other natural incidence and may cause fire or hazard at the site. Following measures will be adopted:

- ✓ All structural, layout and engineering will be carried out in strict accordance withthe applicable bylaws and engineering parameters.
- ✓ The proposed project will be designed according to international standards forthe prevention and control of fire and explosion hazards, including provisions for segregation of process, storage, utility, and safe areas.
- ✓ Safety distances should be derived from specific safety analysis for the facility, and through application of internationally recognized fire safety standards.

8.2.3 Construction Phase Impacts

Construction phase will be the most significant part of the project with respect to environmental considerations, since most of the impacts are likely to take place during this period. Various construction activities will invariably create environmental disturbances, which may have impacts on the physical, biological and social environment of the area and nearby communities.

Such impacts include the following:

- Physical Environment
  - Soil erosion and degradation
  - Air quality deterioration
  - Water Quality (Surface and ground water)
- Biological Environment
  - Loss of Vegetation
  - Damage to wildlife
- Socio-economic Environment

- Traffic congestion
- Noise and vibration
- Safety hazards, Public health and nuisance issues

8.2.3.1 Soil erosion and contamination

Following impacts on soil quality are envisaged due to proposed project interventions:

- Excavation, land clearing and land levelling activities can destabilize the surrounding land surface;
- The unspent materials and debris produced from consumed up materials, if left as such and allowedto mix with soil underneath, can degrade the quality of receiving soils;
- Leakages of oils, lubricants, chemicals, and other similar substances from their storage sites and from engines of the generators, machines, equipment and vehicles can spoil the receiving soils andmay undermine ability of the spoiled soils to support growth of vegetation and plants.

However, it is envisaged that due to project activities, the impacts will be minor and limited to project area only.

- ***Mitigations:***
- All spoils will be disposed of at designated site and the site will be restored back to its original conditions;
- Avoid use of heavy machinery on wet soil to prevent damage to soil structure;
- Land clearing, leveling and grading should be minimized.
- Provision of such native species of trees which help in reducing the erosion.
- Vehicles and equipment will not be repaired in the project site. If unavoidable, impervious sheathing will be used to avoid any soil contamination.
- For the domestic sewage from the construction site, septic tanks will be constructed having adequate capacity.
- Waste oils (if any) will be collected in drums and sold to the recycling contractor.
- Domestic solid waste will be disposed in a manner that does not cause soil contamination/water contamination.
- All the unspent and left-over materials be completely removed offsite upon completion of construction and the site be restored to original or near to original condition.

8.2.3.2 Air Pollution

Air quality will be affected by fugitive dust emissions from construction machinery; dust from the unpaved surface and construction vehicles. Emissions may be carried over longer distances depending upon the wind speed, direction, temperature of surrounding air and atmospheric stability. Besides, multifarious construction activities and increased vehicular traffic (construction vehicles) would also contribute to the localized airborne dust. The larger sized particles, under influence of gravity, tend to settle down in the immediate vicinity of the source. The Suspended Particulate Matter (SPM) tends to remain suspended in the environment for much longer and persistent time and is an environmental hazard. The objectionable impacts of settling of the suspended dust would be its dry deposition on vegetation, motor vehicles, structures, and other exposed surfaces. Exhausts from fossil fuel burning in the construction machinery will also deteriorate local air quality. Similarly, exhausts from generators can also have impacts on air quality in the vicinity. The overall impact on the quality of air during the construction phase will be monitored, however, it will be temporary and limited to the project's implementation phase only.

Mitigation Measures

The construction phase impacts of the proposed Project could be effectively mitigated by the implementation of simple procedures by the Contractor including but not limited to the following:

- All vehicles, machinery, equipment and generators used during construction activities should be kept in good working condition and be properly tuned and maintained in order to minimize the exhaust emissions;
- Open burning of solid waste at construction site should be strictly banned;
- Preventive measures against dust should be adopted for on-site mixing and unloading operations;
- Construction materials (sand, gravel, and rocks) and spoil materials will be transported through trucks covered with tarpaulins and all vehicles (e.g., trucks, equipment, and other vehicles that support construction works) will comply with the PEQS for carbon emissions and noise;
- Regular water sprinkling of the site should be carried out to suppress excessive dust emission(s);
- Emissions from power generators and construction machinery are important point sources at the construction sites. Proper maintenance and repair is needed to minimize the hazardous emissions;
- Construction equipment is generally left idling while the operators are on break or waiting for the completion of another task. Emissions from idling equipment tend to be high. Existing idling control

technologies, which automatically shut the engine off after a preset time can reduce emissions, without intervention of the operators;

- PEQS applicable to gaseous emissions generated by construction vehicles, equipment and machinery should be enforced during construction works;
- Construction workers should be provided with masks for protection against the inhalation of dust;
- Regular monitoring of air quality in accordance with the formulated environmental monitoring plan (given in EMP).
- Vehicle speed in the project area should be prescribed not more than 20 km/ hr and controlled accordingly

8.2.3.3 Noise and Vibration

The noise and vibration will be produced due to the operation of construction machinery and equipment like bulldozers, scrapers, excavators, compactors, trucks, large capacity dumpers, graders, heavy duty cranes, concrete batching plants and stone crushers. The operation and movement of such equipment will increase the noise and vibration in the Project Area. Noise and vibration are perceived as one of the most undesirable consequences of construction activity. The above machinery is expected to generate noise levels that would be severe in the project area. This impact is temporary and moderate in nature.

Mitigations

- For the construction machinery generating noise level in excess of that prescribed in PEQS, Contractor will make arrangements to bring the noise level within applicable limits (including proper tuning of vehicles and mufflers/silencers).
- Movements of the trucks and other construction machinery causing high noise levels must be restricted at night time to avoid disturbance to the nearby locality.
- Truck drivers should be instructed not to play loud music at night and stop use of horn.
- Proper noise barrier boundary walls will be built on asphalt/ concrete plants which come close to any locality.
- Providing the construction workers with suitable hearing protection like ear cap, or earmuffs and training them in their use.
- Use of low noise machinery, or machinery with noise shielding and absorption.
- Contractors shall comply with submitted work schedule, keeping noisy operations away from sensitive points; implement regular maintenance and repairs; and employ strict implementation of operation procedures.

- PEQS standards for noise will be followed for compliance.

8.2.3.4 Impact on Water Resources (Surface and Groundwater Contamination)

The project activities that can contaminate soil may also contaminate the surface water and groundwater. These include.

- Solid waste disposal
- Sewerage disposal
- Equipment/ vehicles maintenance
- Spillage/ leakage of fuels, oils and chemicals
- Camp site sanitation facilities.

Mitigations

- Wastewater from construction sites should not be disposed into the water bodies;
- Soil erosion should be avoided in watershed areas to protect water resources;
- Water required for construction may be obtained in a sustainable way from alternate water sources;
- Provision of septic tanks must be ensured to treat the construction waste and wastewater fromcampsites.
- Septic tanks and sumps will be built at a safe distance from any water hole, stream or dry stream bed,to prevent entry of surface water, and the bottom of the sump will be kept above groundwater level.
- Prohibit washing of vehicles and machinery at the project site.
- No waste should be disposed in the open.
- PEQS and WHO guidelines will be used for any effluent generated from the project relatedactivities, before its discharge into any surface water resources.

8.2.3.5 Solid/Construction Waste Generation

Large quantities of waste will be produced at the different stages of the project. Without a proper solidwaste management system, solid waste may result in odor, breeding ground for disease vector, and aesthetic concerns. Solid waste may result in leachateproduction and percolation in groundwater. The impact of solid waste will be moderate in nature.

Mitigations:

- Three Rs: "Reduce, Reuse, Recycle" waste management hierarchy will be adopted.
- Recording system for the amount of waste generated, recycled and disposed;

- Disallow siting for work camps, including waste dump sites, in a distance closer than one km toany inhabited areas;
- Incorporate technical design features for refuse collection containers at sites that would minimizeburning impacts;
- Devise plan(s) for safe handling, storage and disposal of harmful materials;
- Burning of waste shall not be allowed in any case; and
- All recyclable waste should be used on site or sold out for reuse in market.
- Solid waste generated during construction and camp sites should be safely disposed of at designated waste disposal sites.
- Proper labelling of waste containers, including the identification and quantity of the contents should be carried out.
- Construction workers and supervisory staff should be encouraged and educated to practice waste minimization, reuse and recycling to reduce quantity of the waste.
- Waste disposal plan must be reviewed during the entire construction phase in the light of changing weather conditions.
- Close coordination should be carried out with concerned department for the proper disposal of construction waste.

8.2.3.6 HSE Issues

Worksite related accidents can result in injuries and casualties. Workers may be exposed to unsafe and/or unfavorable working environment due to storage, handling and transport of hazardous construction material. The construction activities and vehicular movement at construction sites and access service roads may also result in roadside accidents particularly inflicting local communities who are not familiar with presence of heavy equipment and machinery. The impact is medium adverse in nature.

Mitigations:

- The contractor will be required to strictly follow WB EHS Guidelines.
- Providing basic medical training to specified work staff and basic medical service and supplies toworkers;
- Work safety measures and good workmanship practices should be followed by the contractor toensure no health risks for laborers;
- Use of PPEs by workers must be ensured by the contractors; and

- Timely public notification on planned construction works.

8.2.3.7 Impacts on Public Health and Safety Hazards

The construction activities and vehicular movement at construction sites may result in roadside accidents particularly inflicting local communities who are not familiar with presence of heavy equipment. Quality of groundwater and surface water resources available in the nearby local communities may be affected due to the construction activities, oil spillage and leakage, roadside accidents, etc. The proposed project will also have potential of air (dust pollution), noise and vibrational impacts on nearby community. The labor works with different transmittable diseases may cause spread out of those diseases in the local residents. The construction areas located near the residential, settlements, may cause accident for the people moving near to those areas. Conflicts may arise between the local community and the construction workers, which may be related to religious, cultural or ethnic differences, or based on competition for local resources.

Mitigations

- Contractor will ensure the provision of medicines, first aid kits, emergency vehicles, etc. at the work place.
- The laborers with different transmittable diseases will be restricted within the construction site.
- Ensure that the site is restricted for the entry of irrelevant people particularly children.
- Training of workers in the construction safety procedures, environmental awareness, and equipping all construction workers with safety boots, helmets, gloves, ear plugs, and protective masks, and monitoring their proper and sustained usage.
- Provision of proper safety and diversion signage, particularly at urban areas and at sensitive/accident-prone spots.
- Setting up speed limits in close consultation with the local stakeholders.
- The mitigation measures provided for air and noise shall be adopted to reduce the air pollution, noise pollution and vibrational impacts on nearby community.
- Defensive driving practices will be inculcated in the project drivers through trainings, posters and other similar measures.
- Vehicle speeds of 20 km/hr at the project site will be implemented.
- Personnel injuries risks can be mitigated through the provision of appropriate training and emergency response procedures.
- The contractor will ensure better working conditions for its employees.

- Firefighting equipment will be made available at the site offices and construction workers. Construction staff will be provided firefighting training.
- Road signage will be fixed at appropriate locations to reduce safety hazard associated with project-related vehicular traffic

8.2.3.8 Occupational Health and Safety Occupational Health and Safety (OH&S)

OH & S related impacts will arise during construction phase activities including clearing of earth, levelling, compaction, carpeting, pavement finishing and testing & commissioning. Eye injury can be caused by stone or metal particles. Hazard of being hit by falling objects, major hand-arm and whole body vibration hazards, skin and respiratory tract irritation from exposure to cement dust, overexertion and awkward postures etc. will be another impact. Welding hazards include electric shock, fumes and gases, fire and explosions, falls from height, eye and head injuries etc. Security as well as the safety of the Contractor and Consultant staff will be major issue. Operating mechanical and electrical equipment will trigger the H&S issues e.g., struck by moving vehicles or other equipment, slips or trips, struck by flying objects, such as dirt or splashed fluids, caught in pinch points, shear points, crush points, falling from machine etc. Considering these consequences, this impact temporary and medium probability.

Mitigations

- Providing basic medical training to specified work staff and basic medical service and supplies to workers;
- Training of workers in construction safety procedures, environmental awareness, equipping all construction workers with safety boots, helmets, gloves and protective masks, goggles, shields and monitoring their proper and sustained usage;
- Contractor will ensure the provision of medicines, first aid kits, ambulance etc. at the camp site;
- Contractors will instruct their staff to use Personnel Protective Equipment (PPE) (e.g., wire containment, displaying warning signs along the work site, communicating advance warnings to mats) to enhance the safety; and
- Safety lookouts will be built to prevent people and vehicles from passing at the time of hot or cold work; and
- An emergency management plan must be devised by the contactor in close coordination with the provincial emergency services.

8.2.4 Operation Phase Impacts

8.2.4.1 AIR EMISSIONS

POTENTIAL IMPACTS

Air emissions from the project are relatively small. Particulate emissions are typically not significant. Fugitive dusts and emissions may likely to occur. Other potential sources for air emissions are combustion products (nitrogen oxides, sulfur dioxide, particulate matter, carbon monoxide) from standby diesel generators and combustion products from vehicles used for project activities. The emissions from standby generators will be less in concentration. The emission levels depend on the type and quality of fuel and the manner in which it is burnt.

MITIGATION MEASURES

The following mitigation measures will be implemented. The proposed mitigation measures to reduce the impacts on air quality during the proposed operation activities are:

- Monitoring of Ambient air parameters (Particulate matter, SOx, NOx) emissions should be carried out on regular basis to ensure compliance with the PEQS.
- Plantation of indigenous trees within the premises and along the boundary.
- Proper tuning and maintenance of generator
- Boiler will be equipped with cyclone and wet scrubber.

RESIDUAL IMPACT

If proper mitigation measures are effectively implemented, the residual impact of the proposed activities on the area's air quality is expected to be low in terms of significance.

8.2.4.2 NOISE

POTENTIAL IMPACTS

The main sources of pollution from noise are during raw material and finished good loading and unloading, vehicle movements, operation of machines. The increased noise may be a source of disturbance to workers, working near to the machines. Noise level during operation phase of unit will be limited to operational site. Workers could be exposed to high noise levels, however only concerned staff will be working in the area with required personal protective equipment (PPE) to minimize or reduce the noise exposure.

MITIGATION MEASURES

The following mitigation measures will be undertaken in order to further reduce the noise levels:

- Effective noise suppression design and plan will be made for all noise producing equipment i.e. high noise generating machines will be kept in isolation from other machines to minimize the overall cumulative noise.
- It will be ensured that generators, vehicles and other potentially noisy equipment are in good condition. Noise from generators, vehicles, other equipment and machinery will be kept to the minimum through regular maintenance.
- Noise monitoring will be carried out periodically.

RESIDUAL IMPACTS

Implementation of the mitigation measures proposed above will result in negligible to no residual impact due to unit noise on the surrounding environment.

8.2.4.3 TRAFFIC

The operational phase of the said unit will result in increased traffic. However, the impact will be minimal. Vehicles will be well maintained to prevent unnecessary exhaust emissions and drivers will be appropriately trained.

MITIGATION MEASURES

The following mitigation measure will be implemented.

- Nighttime driving of project vehicles will be limited where possible.
- Vehicles will remain confined to defined access.
- Speed limits will be maintained.
- Road signage relevant to the project traffic will be placed, where necessary.
- Community complaint register and other means will be adopted for the community to complain about non-adherence of traffic to speed limits, safe driving and other safety related concerns.
- All vehicle drivers will be trained in community safety aspects. Drivers will be trained in responsible and safe driving practices; safe speed limits for vehicles will be followed.

8.2.4.4 SOLID WASTE

There will be generation of wastepaper / combustibles that should be disposed-off properly. Wash water, culls, peels, potato pieces (nubbins) from the slicers and inspection tables, will be produced from new proposed FF line. Ash willbe produced from proposed boiler, and it may impact on the surrounding environment and the workers.

MITIGATION MEASURES

- Potato waste including trims, peels and under-grade sticks will be generated from French Fries Line that will be sold to vendors who make cattle feed. Solid waste of said unit can also be used as:
    - Animal feeding
    - Production of potato flakes, potato gnocchi, dumplings etc.
    - Production of Hash Brown or similar
- Take measures to ensure paperless environment. There should be maximum utilization of electronic media.
- There should be a control over issuance of paper to restrict its excessive use.
- Separate waste bins will be placed for different type of wastes plastic, paper, and metal etc.
- No waste will be dumped at any location outside the plant boundary.
- Records of all waste generated will be maintained. Quantities of waste disposed, recycled, or reused will be logged on a Waste Tracking Register.
- Training will be provided to personnel for identification, segregation, and management of waste.

8.2.4.5 WASTEWATER

Wastewater will be generated from proposed potato processing line during washing process and cooling of boiler. The effluents may contain high organic loads, cleansing, salt, and suspended solids such as fibers and soil particles.

MITIGATION MEASURES

- ✓ A water management strategy will be developed to ensure minimal water use during washing process; hence volume of discharge will be minimum.
- ✓ Follow good housekeeping practices with potato line machinery that may potentially discharge

wastewater.

- ✓ Blowdown wastewater from boiler will be recycled in cooling system.
- ✓ Procure clean raw potatoes, thus reducing the concentration of dirt and organics in the effluent.
- ✓ Wastewater will be used in proponent own agricultural field

8.2.4.6 OCCUPATIONAL HEALTH AND SAFETY

This section discusses the occupational health and safety impacts of the operation of unit. Physical hazards may include exposure to same-level fall hazards due to slippery conditions. In a variety of situations, a worker can be exposed to lifting, carrying, and repetitive work and work posture injuries.

MITIGATION MEASURES

In order to reduce the physical hazards and other health and safety issues that may be encountered at workplace, following will be followed.

- Proper training will be provided for the proper usage of machineries and personal protective equipment (PPE) will be provided. It will be ensured that the individual who has received the correct training is operating a particular machine.
- Regular housekeeping practices will be ensured by keeping the floor dry and during washing; proper protective equipment are being used. Restricted entry should be ensured during washing.
- Training of staff in the handling of lifting materials.
- Timely maintenance and repair of electrical equipment will be conducted.
- Implementation of work rotations, provision of regular work breaks.
- At workplace, first aid facilities will be maintained at readily accessible places.

8.2.4.7 SOCIOECONOMIC IMPACTS

A summary of potential socio-economic impacts of the project is presented in Table below.

Table 8-1: Potential Socioeconomic impacts of the project

Impact	Beneficial	Adverse
Economic	Employment generation Procurement of equipment and services Local authority business tax / rates revenue Increase in property value	Negative economic Impacts are not anticipated

Social	Indirect beneficial community impacts from employment Provision of training to employees and workers	Risks of occupational and environmental health issues.

By implementing the following mitigation measures, impact to community can be minimized.

- All vehicle drivers will be trained in community safety aspects.
- The company will maintain a social complaint register at the site to document all complaints received from local communities. The register will also record the measures taken to mitigate these concerns.
- It will be ensured that generators, vehicles, and other potentially noisy equipment used are in good condition. Noise from generators, vehicles and other equipment will be kept to the minimum through regular maintenance.
- Maximum number of unskilled and semi-skilled jobs will be reserved for the local communities.

8.3 POTENTIAL ENVIRONMENTAL ENHANCEMENT MEASURES

8.3.1 EMPLOYMENT OPPORTUNITIES

The project is expected to have positive impact on economic condition of locals. Employment opportunities will be generated due to said project activities. The project will generate approximately 20-30 jobs during operation phase of the project.

Similarly, the operation of the project will create far greater number of indirect income resources for example income resource for transporters for the transportation of the raw materials, procurement of required goods from local market etc.

Overall the project will have a positive impact on the employment opportunities of Pakistan.

8.3.2 GREENBELT DEVELOPMENT

Apart from functioning as a pollutant sink, green belts provide other benefits like:

- Green belt helps in noise abatement for the surrounding area. Thus, it is recommended as noise barriers.

- Green belt helps in achieving bio diversity by providing possible habitats for birds and animals.
- Green belts increase the aesthetic value of the site.

Adequate number of small plants and trees are planted along the periphery of the unit and available open spaces.

ENVIRONMENTAL MANAGEMENT PLAN

9.1 GENERAL

This chapter summarizes the various mitigation measures as outlined previously in this EIA Report that will be implemented during the construction, operational and decommissioning stages of project. It does not discuss further the mitigation measures which have been adopted within the design and planning of the project, as these are comprehensively covered in previous section of this EIA Report. Outline and key features of the EMMP for operations phase of the aforesaid project is presented in the sub-sections below. As per the environmental legislation in Pakistan, the compliance status of the conditions mentioned in the construction should be submitted along with other documents to the environmental protection agency to obtain confirmation for compliance and Environmental Approval for project operation. Even after implementation of the suggested mitigation measures, the impact may remain significant, and requires regular environmental monitoring.

9.2 Objectives

An Environmental Monitoring Plan (EMP) was outlined alongside Environmental Management Plan to ensure all the corrective actions to counter adverse impacts which gives a detailed EMMP. The EMMP will serve as a principal execution module of the project that would not only mitigate adverse environmental impacts during the installation and the operational phase of the project but also ensures that environmental standards and good in-housekeeping are being practiced. Continuous environmental monitoring is exercised to ensure that preventive measures are in place and effective to sustain environmental integrity.

The key objectives of EMMP are:

- To outline functions and responsibilities of persons associated with the commencement of the proposed project
- To state and implement standards and guidelines which are required under environmental legislations particular in context to the proposed project commencement
- To facilitate the implementation of the mitigation measures by providing the technical details of each Project's impact and proposing implementation schedule of the proposed mitigation measures
- Define a monitoring mechanism and identify monitoring parameters to ensure that all proposed mitigation measures are completely and effectively implemented

- Identify the resources required to implement the EMMP and outline corresponding financing arrangements

9.3 MANAGEMENT APPROACH

The organizational roles and responsibilities of the key players are summarized below:

Proponent*:* The project proponent will undertake overall responsibility for compliance with the EMP. Concerned Departments will carry out verification checks to ensure that the contractors are effectively implementing their environmental and social requirements.

Contractors*:* The contractors will implement the majority of environmental and social mitigation measures. The contractors will carry out field activities as part of the project. The contractors are subject to certain liabilities under the environmental laws of the country, and under its contract with proponent.

9.4 COMPONENTS OF THE EMP

The EMP consists of the following:

- Management plan
- Monitoring Plan
- Communication and documentation
- Institutional capacity
- Environmental training

9.5 ENVIRONMENT MANAGEMENT PLAN

It lists all the mitigation measures identified in the EIA and the associated environmental or social aspect in line during operational phase with the administrative framework involving all the responsible implementing authorities who are required to take the planned actions/measures. It enhances project benefits by reducing its impacts and making it environmental friendly.

Objective	Management Action	Responsibility	Time framework	Residual impact
Construction phase				
Employment Opportunities				
To promote the employment of local persons	Recruitment of local workers will be undertaken without discrimination and in accordance with company recruitment policy by contractors involved in construction	Contractor	On commencement of construction activities	Unemployed people of area will get job opportunities and their standard of living improved
To promote the use of local service providers	Local procurement of goods and services will be undertaken wherever possible and cost effective and where practicable to the project	Contractor	On commencement of construction activities	Indirect job opportunities
Safety during construction				
To ensure safety on construction site	• Safety signage will be put in relevant places within the construction site • Construction drivers are subjected to public safety awareness • Reckless driving by construction workers will be prohibited and monitored • Workers will be given PPEs such as; helmets, mask, ear-plugs/muffs, safety boots, etc. and its use will be strictly enforced • Workers will be trained on the regular basis regarding personal safety • Incidents will be reported directly to the concerned authority	Contractor/Environmental manager/EHS manager	On commencement of construction activities	Safety of workers will be ensured by implementing proposed mitigation measures
Construction waste management				

To prevent the contamination of soils and water resources due to inappropriate management and disposal of waste	• The construction site will have litter bins for waste collection • Recycling or reuse of waste wherever possible. • Application of a good strategy to collect, remove and safely dispose of waste on daily basis to ensure a clean environment in the factory site • Integrated waste management system will be adopted for the proper management of the waste at site • At the end of the construction phase, left-over waste will be removed by using the standard waste management procedures • All the idle machinery and equipment will be immediately removed from the site • Scrap and the debris will be removed from the site at the end of the construction stage after appropriate segregation of the material	Contractor	Throughout construction stage	Waste will be disposed of/reused/ recycle or resale as per practices of area
Pollution control management				
To contain spillages	• Proper maintenance of construction vehicles and equipment will be undertaken • Appropriate environmental security measures including shovels and plastic bags etc will be provided to prevent accidental release to ground.	Contractor	On-site establishment	Potential for accidental release of materials during transport and handling on the site will be minimized.

	• Appropriate procedures and protocols will be established and monitored for materials transport and handling whilst on the site.			
Protection of biodiversity				
To avoid unnecessary disturbance of and quick recovery of biodiversity in the plant site	• Avoid destruction of biodiversity outside the designated factory construction site • Minimize clearing of vegetation during construction • Surface soil excavated during construction to be placed back on the sub-soil to fast vegetation recovery • Prepare and implement an appropriate landscaping programme to help in re-vegetation of affected project areas after construction • The flora of the site will be restored at the end of the construction phase by landscaping and planting native vegetation	Contactor	Throughout construction phase	Vegetation loss cannot be avoided, but successful restoration, improvement and long-term management of the surrounding areas and maintenance of planted trees will be provided
Air quality & dust management				
To minimize the dust entrainment during construction	• Regular surface wetting will be implemented on dusty sections in the factory construction site • Strict on-site speed controls will be enforced for construction vehicles • All trucks hauling soil, sand and other loose materials will be covered	Contractor	On commencement of construction activities	Dust propagation was limited to construction area and did not influence local community. However workers will be supplied with dust masks especially on dry days.

	• No excavation activity will be carried out during windy days • Fuel-efficient and well-maintained haulage trucks will be employed to minimize exhaust emissions • Construction workers will be sensitized on measures to reduce air pollution			
Noise				
To minimize disturbance due to noise	• Loading and unloading of materials will be done carefully to reduce noise disturbances to surrounding households • Residences are at a safe distance from site so no disturbance is envisaged. • Drivers will be instructed to avoid unnecessary gunning of vehicles, hooting and buzzing. • Regular maintenance of the machinery will be done to reduce the noise • Vehicles will be tuned on regular basis	Contractor	On commencement of construction activities	Noise level will be within PEQs
Occupational health & safety				
To ensure healthy and Secure/safe environment in the construction site for all workers	• Management will ensure that fire extinguishers are located in strategic and visible places	Contractor	Throughout construction phase	Record of all incidents will be maintained and reported to EHS manager.

	• All vehicles and construction equipment will be under control of competent personnel • Inspection of material and harmonization to the occupational health and safety standards. • Adequate security for workers will be be provided during construction • Sensitize workers to operate in teams			
Operation phase				
Wastewater management				
Degradation of surface waters quality due to washing water and sewage direct disposal	• A water management strategy will be developed to ensure minimal water use during washing process; hence volume of discharge will be minimum. • Follow good housekeeping practices with potato line machinery that may potentially discharge wastewater • Wastewater will be used in own agricultural land. • Procure clean raw potatoes, thus reducing the concentration of dirt and organics (including pesticides) in the effluent.	Rafiq Farm Foods Pvt. Ltd.	Throughout project life cycle	None

Air quality management				
Particulate emissions and stack emissions	Source of Air Emission from the said project is exhaust from Generator, boiler and vehicles. • In order to control the emissions from generators, all the generators will be provided with enclosure. • Further proper tuning, maintenance and regular monitoring of generator will be ensured on regular basis. • Tree plantation will be done to further minimize impact of emissions. • A set frequency of stack emission monitoring is required to check the generator emissions and impact on environment. • Further ambient air quality monitoring is also required to be conducted to compare pollutants concentration level as per legal,	Rafiq Farm Foods Pvt. Ltd.	Throughout operation phase	Local air quality will be virtually unaffected and will be based on PEQs

	environmental compliance requirements • Boiler emissions will be controlled by providing cyclone and wet scrubber.			
Noise & vibration				
To minimize disturbance of communities due to noise	• All the machinery will be installed and operated in a closed hall • Equipment should be regularly serviced. • Ensure that the workers are wearing PPE's (ear plugs, ear muffs etc.) where engineering control is not applicable to reduce the impact of noise • Schedule different noisy activities to occur at the same time as less frequent noise activities would be less annoying. • A thick greenbelt will be developed all around the plant which will be acting as noise barrier.	Rafiq Farm Foods Pvt. Ltd.	Throughout project life cycle	Noise level will be based on PEQs

	• Introduction of control and monitoring rooms having good sound insulation properties. • All the workers will be provided with ear plugs. • All the transporters will be advised to carry out regular maintenance of their vehicles.			
Traffic & transport				
Increased heavy vehicles traffic both locally and nationally.	• Restricting delivery hours to reduce noise nuisance; avoid heavy truck movements in the night hours will be considered whether deliveries should be scheduled to avoid peak times to reduce congestion	Management of Rafiq Farm Foods Pvt. Ltd.	Throughout project operation	The traffic has the potential to contribute to congestion and lead to complaints due to noise/vibration nuisance on a local basis. However, the study indicates that there will not be a significant impact.
EHS				
To minimize loss work injury/hazards/incidents/accidents	• Training regarding EHS should be given on the regular basis • Workers will be given PPEs such as; helmets, mask, ear-plugs/muffs, safety boots, etc. • It should be strictly enforced to wear PPEs while working • Workers will be trained on the regular basis regarding personal safety and disaster management	Environmental manager/EHS	Throughout life cycle of project	Potential of injuries will be minimized

	• Incidents should be reported directly to the concerned authority			
First aid				
To ensure safety and health	• First aid box will be available at the site • First aid training will be given to the employees on the regular basis • Numbers of all the concerned/authorized persons that will be contacted in the case of emergency will be displayed on-site	Environmental manager/EHS	Throughout life cycle of project	None
Fire hazard				
To prevent any disaster	• Firefighting equipment including DCP type fire extinguisher, CO2 Type extinguisher, sand buckets, sand drums with spade and hose pipe cabinet will be installed inside the plant • All the equipment will be placed at strategic locations where the risk of out-burst of the fire is high. • Smoking will not be permitted in the vicinity of the plant • Regular site inspection will be done to eliminate all the chances of the hazards • Checking and maintenance of the fire-fighting equipment will be carried out on the regular basis	Environmental manager/EHS	Throughout life cycle of project	Potential of disaster will be minimized by suggested mitigation measures implementation
Employment				

To provide job opportunities and helping in improving living standard of people	• During this phase, skilled and unskilled labour will be required. • Employment opportunities for the un-skilled workers will therefore increase which will enhance the positive benefits for the local people who are in dire need of income for sustenance. • Indirect opportunities for employment will arise from the provision of services to the construction teams, such as sale of raw-material such as cement, bricks, sand etc., as well as food and beverages for the labour and after completion of construction phase serve as a permanent business opportunity.	Rafiq Farm Foods Pvt. Ltd.	During construction and operation phase	Direct and indirect jobs
Solid Waste Management				
Potato trims, peels and under-grade sticks	Potato waste including trims, peels and under-grade sticks will be generated from French Fries Line that will be sold to vendors who make cattle feed. Solid waste of said unit can also be used as: • Animal feeding • Production of potato flakes, potato gnocchi, dumplings etc. • Production of Hash Brown or	Rafiq Farm Foods Pvt. Ltd.	Throughout operation phase	Local air quality will be virtually unaffected and will be based on PEQs

	similar • Take measures to ensure paperless environment. There should be maximum utilization of electronic media. • There should be a control over issuance of paper to restrict its excessive use. • Separate waste bins will be placed for different type of wastes plastic, paper, and metal etc. • No waste will be dumped at any location outside the plant boundary. • Records of all waste generated will be maintained. Quantities of waste disposed, recycled, or reused will be logged on a Waste Tracking Register. • Training will be provided to personnel for identification, segregation, and management of waste.			

9.6 Roles and Responsibilities of Environment Management Team

The Proponent will utilize the following arrangements in the implementation of theEMMP during planning and design, construction, and operation phase. The Proponent is accountable for ensuring that resources are made available to effectively implement the EMMP and necessary environmental management measures arising from the project.

Position	Responsibility
Project Manager	• Supervising construction works. • Schedule preparation and resource forecasting for engineering and other technical activities relating to the project. • Effective implementation of the EMMP • Regular performance reviews • Corrective and/or remedial action where this may berequired.
Contractor	• Undertake development of facility in accordance withcontract signed with the Proponent. • Adhere to Proponent HSE policies, procedures and other requirements while undertaking the Project. • Implement aspects of EMMP assigned to them.
HSE Executive	• Preparation of environmental monitoring, reporting and anypermit applications (if any) • Overseeing of construction process and ensuring theimplementation of avoidance and mitigation measures • Conducting monitoring and review of EMMP implementationby contractor • Inspect the constructed facility after completion.

	• Develop policies and procedures on the environmental,social, health and safety issues. • Oversee implementation of the EMMP. • Review and analysis of monitoring results and preparationof brief reports to Project Manager • Planning of training programs for personnel in accordancewith relevant laws • Oversee inspection of the constructed facility after • completion of construction works

9.7 ENVIRONMENTAL MONITORING PLAN

Environmental monitoring is a vital component of the Environmental Management Plan. It is the mechanism through which the effectiveness of the environmental management Plan in protecting the environment is measured. The feedback provided by the environmental monitoring is instrumental in identifying any problem or lapse in the system under implementation and planning corrective actions.

Table 9-1: Environmental Monitoring Plan

Env. Components	Project Stage	Parameters	Instrument	Standards	Monitoring			Institutional Responsibility
					Location	Frequency	Duration	
Air	Construction	PM_{10}, SO_2, NO_2, CO, SPM ,O_3	Air Quality Monitors/Gadgets	PEQS	Project site	Twice during construction	As per approved testing method	Contractor through approved monitoring lab
	Operation	PM_{10}, SO_2, NO_2, CO, SPM ,O_3	Air Quality Monitors/Gadgets	PEQs	Project site	Quarterly	As per approved testing method	Through approved third party/monitoring lab
Noise Levels	Construction	Noise levels on dB(A) scale	Digital Sound Meter	PEQs	Project site	Twice during construction	Reading to be taken at 15 seconds interval for 15 minutes every hour and then averaged	Contractor through approved monitoring lab

	Operation	Noise levels on dB(A) scale	Digital Sound Meter	PEQs	Project site	Annually	Reading to be taken at 15 seconds interval for 15 minutes every hour and then averaged	Through approved third party/monitoring lab
Water Quality	Construction/ operation	Groundwater Quality (Total Coliform, Fecal E.Coli, pH, TDS, Total hardness, Alkalinity	As per EPA approved methods	PEQs	Ground water	Quarterly	As per approved testing method	Through approved third party/monitoring lab

9.8 REPORTING AND REVIWING PROCEDURES (Communication and Documentation)

An effective program for storing and communicating environment information during the project is an essential requirement of an EMP. This activity will be done by an independent monitoring consultant. The key features of such a mechanism are:

- Precise recording and maintenance of all information generated during the monitoring in a predetermined format.
- Communicating the information to a central location

- Storing the raw information in a central database
- Processing the information to produce periodic reports

Data recording and maintenance: All forms will be numbered and a tracking system will be developed for each. Whenever a form is released for use in the field, its number will be recorded. The monitors will be required to account for each form after completion. In this manner, it will be ensured that all forms are returned to the office, be they filled, unused or discarded.

Storage of information: A database for information collected during the project will be prepared. The database may include information on training programs, staff deployment, non-compliance, corrective actions, water resources, results of effects monitoring.

Meeting: For effective monitoring, management and documentation, of the environmental performance during the operation, environmental matters will be discussed during a daily meeting held on-site. Environmental concerns raised during the meetings will be mitigated after discussions with the proponent site representatives.

Reporting: Monitoring body will produce daily, weekly, monthly and another periodic report, as well as a final report of the project based on the information collected. The proponent site representative and the contractors will also prepare a weekly environmental report. Copies will be provided to the proponent and contractor's higher management

9.9 Schedule for Implementation & Environmental budget

Approximately PKR 1.8 Million budget will be reserved for tree plantation, solid waste management, trainings and environmental monitoring. Monitoring tests for ambient air quality, noise and groundwater quality will also be conducted.

Table 9-2: Schedule for Implementation & Environmental budget

Amenities	Frequency	Cost in PKR (Million)	
Ambient air monitoring	Construction: Biannualy Operation: quarterly	20,000/-	0.8 Million

Noise monitoring	Construction: Biannualy Operation: quarterly	10,000/-	
Water quality monitoring	Construction: Biannualy Operation: quarterly	20,000/-	
Health & safety	Daily	500,000/-	
Tree Plantation/Green Belts Development	Monthly	200,000/-	
Solid Waste Management	Monthly	50,000/-	
Trainings	Monthly	1 Million	
Total Cost		**PKR 1.8 Million**	

9.10 Training Program

Training programs are a necessary agenda that has to be implemented to effectively implement Environmental Management & Monitoring Plan. The Environment, Health & Safety Officer will impart training to the contractor's staff. The key objective of the training program is to ensure that the requirement of EMP are clearly understood and followed throughout the project. The training shall cover following areas:

- EMP communication and documentation requirement.
- Community issues and their mitigation measures.
- Safe construction practices
- Use of personnel protective equipment's (PPEs)
- Environmentally sound construction practices
- Vehicular safety.
- Site restoration requirement.
- Solid Waste Disposal

Type of Training	Training Description	Period	Duration	Training By	Trainee
Occupational Health & Safetyfor workers	Health, safety and hygiene. Proper usage of Personal Protective Equipment (PPE's), Precautions to be taken for working safely	Before Construction Activities	Full Day	EHS Manager	Workers
Solid Waste Management	Waste segregation, identification of HazardousWaste, Use of PPEs and waste Handling	Before Commencementof Project Activities	Full Day	External Sources	Relevant workers and staff
Vehicular safety	Safe operation and maintenance of all vehicles, insurance in accordance with the applicable local and provincial/federal laws	Before Commencementof Project Activities	Full Day	EHS Manager	Relevant workersand staff
Health Safety and Environmental Auditing	Health Safety and Environmental Audits,Reporting Requirements	Before Commencementof Project Activities	Full Day	External Sources	Relevant Department
Implementation of environmental management and monitoring plan	Explanation of Environment Management andMonitoring Program	Quarterly. As soon asthe project activities start	Full Day	External Sources	EHS Staff

STAKEHOLDERS CONSULTATION

10.1 GENERAL

Public consultation refers to the process by which the concerns of local affected persons and others who have plausible stake in the environmental impacts 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, public consultation is mandatory for any socio-environmental study.

Impact assessment survey and public consultation sessions held with different stakeholder groups that may be impacted by the said project development. The consultation process was carried out in accordance with the guidelines laid by EPA. The objectives of this process were to:

- Share information with stakeholders on said 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 the said project
- To invite people to express their views about the positive/negative impacts on their life styles and environment

This report includes all the comments, which were taken into account in preparing the definitive development concept for the establishment of said project..

10.2 OBJECTIVES OF CONSULTATION

Public consultation plays a vital role in studying the impacts said project on stakeholders in its successful implementation and execution. It provides an opportunity to exchange knowledge with theall stakeholders. Referring particularly to a project related to environmental assessment, involvement of public is all the more essential, as it leads to better and more acceptable decision-making. The overall objective of the consultation with the stakeholders is to help verify the

environmental and social issues, besides technical ones, that have been presumed to arise and to identify those which are not known or are specific to the project. In fact, discourse with many who have thoroughly observed the site conditions in the pre-developmental phase, goes a long way in updating the knowledge and understanding.

10.3 IDENTIFICATION OF STAKEHOLDERS

All the people who are directly or indirectly affected or concerned with the project are the stakeholder. Besides the living population of the surrounding areas, some other stakeholders were identified and contacted. They are the key players including; shops owners, vendors, public offices, school, university, hospitals,. Not only published material (Both brief and comprehensive literature were obtained on request) but also noted their views and the concerns. Following stakeholders are identified for this project:

Project stakeholders include the settled families, either property owners or the tenants, businessmen (land owners, traders, shopkeepers, vandors, transporters, restuarent owners etc.), employees of the commerical entities. PAPs are of two types, for instance:

10.3.1 Direct

In this case, the PAPs are those who will be benefited directly by project. No disturbance on the local community is being foreseen due to the installation of the said plant.

10.3.2 Indirect

Indirect impact will occur on those who are living or doing business within project area of influence. Indirect respondents include;

- ✓ Government agencies responsible to deal with the project related activities
- ✓ Government Agencies directly, indirectly or widely involved in the execution and monitoring of the said project
- ✓ Workers of political, cultural, religious or social scientific bodies, directly or indirectly related

10.4 PUBLIC DISCLOSURE

Public disclosure is the outcome of all such activities where public is involved at least in the information sharing process. This is an integral part of that process so before the proponent applies

for NOC to the EPA, this disclosure will be distributed properly among all stakeholder. It is the responsibility of the proponent and the consultants to display public disclosure document at prominent places where community has easy access.

10.5 CONSULTATION PROCESS

Information disclosure, public consultation and discussion regarding the various aspects of the project with the people of the area are necessary. This process is intensified during the EIA Studies, and separate rounds of public consultations were held. Surveys were carried out in order to investigate physical, biological and socio-economic resources falling within the immediate area of influence of the project. Primary data collection included:

- Data collection regarding the socio-economic condition of the study area
- Pretesting of socio-economic survey tools in the field
- To consult the locals for collection of information on biological environment

Various meeting with the stakeholders were held the following objectives:

- Share information with stakeholders on the said project and expected impacts on community in the vicinity of the project
- Understand stakeholders' concerns regarding various aspects of the project, including the existing condition of the upgrading requirements, and the likely impact of construction and operation activities
- Provide an opportunity to the public to influence the project design in a positive manner
- Obtain local and traditional knowledge, before decision making
- Increase public confidence about the proponent, reviewers and decision makers
- Reduce conflict through the early identification of controversial issues, and work through them to find acceptable solutions
- Dissemination of information through discussions, education and liaison
- Documentation of information narrated by the stakeholders and mitigation measures proposed by the stakeholders
- Incorporation of public concerns and their address in the EIA; and eliciting their comments and feedback

10.5.1 Consultation Methodology

The methodology adopted for consultations is summarized below.

10.5.1.1 Consultation Material

The main document for distribution to stakeholders during the consultations was Social Impact Assessment Interview**.**

10.5.1.2 Consultation Mechanism

Primary stakeholders were consulted during informal and formal meetings held in the project area. The consultation process was carried out in the Urdu language. During these meetings a simple, non-technical, description of the project was given, with an overview of the project's likely human and environmental impact. This was followed by an open discussion allowing participants to voice their concerns and opinions. In addition to providing communities with information on the said project, their feedback was documented during the primary stakeholder consultation. The issues and suggestions raised were recorded in field notes for analysis, and interpretation.

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 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.

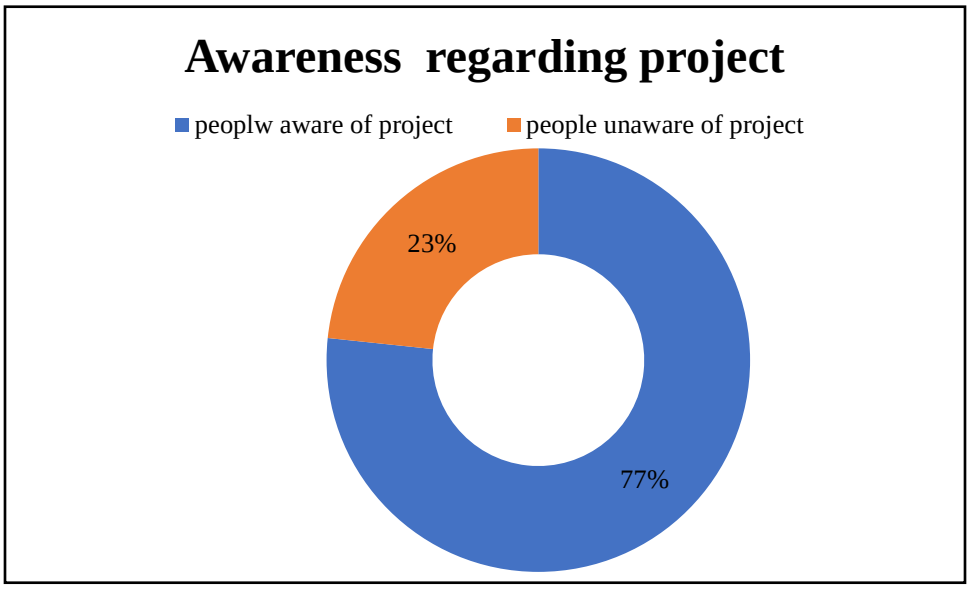
10.5.2 Primary Stakeholders Consultation

The community consultations were conducted with the community members outside their settlements to encourage and facilitate their participation. Consultation was done for 1 day.

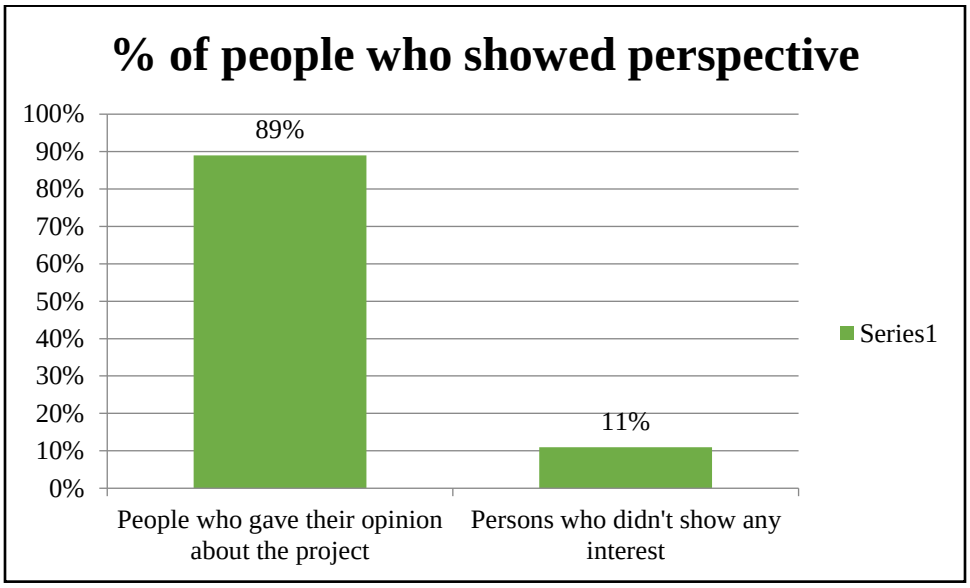
10.5.2.1 STAKEHOLDER CONCERNS AND RECOMMENDATIONS

The finding of the community consultation has been addressed in various sections of EIA. Mitigation plan has been incorporated into EMP. The summary of consultation with various stakeholders is given below

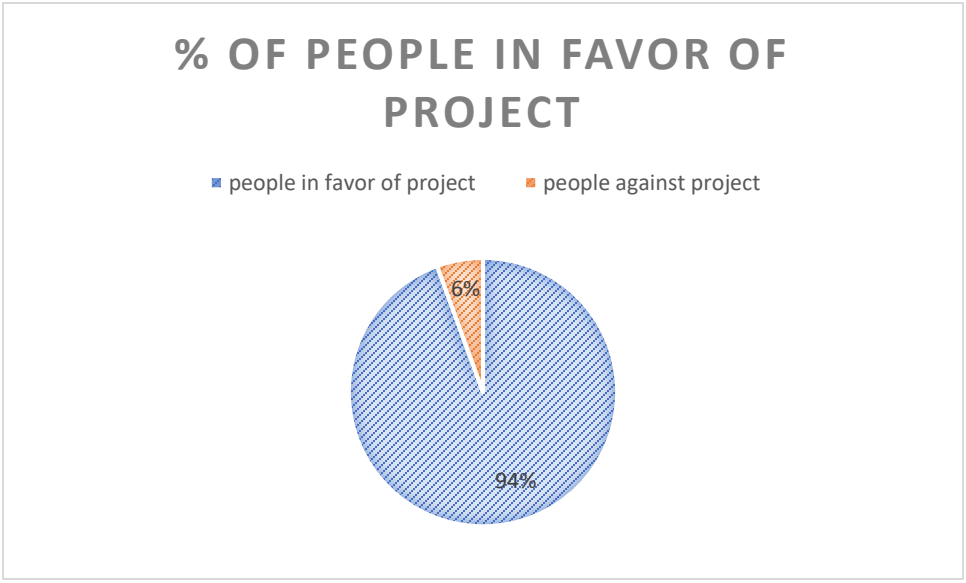
Out of total respondents of, 77% knew about the project whereas 23% were not aware of the project planning and implementation. All people were then briefed about the project.



89% commented their views about the project and 11% didn't respond.



Out of 89%, majority of the people (about 94%) favored the construction of the project keeping in view its importance and 6% people showed pessimistic views in general but mitigation measures and solutions to their concerns were provided.



Majority of people were in favor of project. They said that project will result not only in direct jobs opportunities for locals but also will enhance subsidiary business, trade, education, and community development. The people were of the view that industry might also elevate education standards, struggle for career enhancement besides improvement in standard and quality of living

in area. People were also of the view that industry may also be instrumental in connecting the local people with major cities and will result in increase in GDP.

Very few near to 6 % only shows concerns over generator and boiler emissions, noise, and health impacts. Majority of the concerns were changed in the favor of installation after communicating the participants proper solutions and mitigation measures. Some of concerns shown by public are:

- The project would encourage potatoes farming in the region
- There will be both direct and indirect employment for the people: the former will apply to workers who will be employed by Rafiq Farm Foods Pvt. Ltd. and the later will apply to farmers and those who will be employed in business that will spring up due to the presence of said project.
- New businesses will spring up and old ones will grow as a result of migration of people in the area.
- The local economy is likely to grow through backward and forward linkages and income and employment multiplier effects resulting from the project.
- The establishment of project in the region will contribute to industrial development.
- The project will enhance export of country

10.5.2.2 LIST OF PRIMARY STAKEHOLDERS CONSULTED

Names and CNIC of consulted stakeholders are given in table below:

Table 10-1: List of consulted stakeholders

Sr. No	Stakeholder name	CNIC Number
1.	Muhammad Hakim	32301-0899669-5
2.	Abdulaziz	32302-8865076-7
3.	Asghar Ali	32301-6707794-1
4.	Kashif Ali	32301-1042443-9
5.	Parvez Hussain	31304-3641875-7
6.	Muhammad Naeem	32301-7769904-3
7.	Muhammad Zulfiqar	32302-1923668-3
8.	Muhammad Waqar	32301-2286586-7

9.	Muhammad Arif	32301-3560885-7
10.	Muhammad Javed	32301-2306631-7
11.	Muhammad Jalal	32301-3712974-7
12.	Muhammad Tofail	31301-1430910-3
13.	Syed Barat Hussain	32301-0911865-5
14.	Arif Khan	32302-9944089-5
15.	Basheer Hussain	32301-1072234-5
16.	Saddam Hussain	32302-6563777-9
17.	Muhammad Javed	32301-6984887-3
18.	Muhammad Aslam	32302-1531131-3
19.	Hameed Ahmad	32301-5823956-3
20.	Muhammad Zafar	32302-8161811-7
21.	Muhammad Maqsood	32301-6784699-1
22.	Muhammad Aslam	32301-8661151-9
23.	Muhammad Akram	32301-5319694-7
24.	Muhammad Aslam	32301-7149972-1
25.	Muhammad Arshad	32301-0750673-3
26.	Muhammad Amir	32302-4496559-7
27.	Muhammad Hashim	32301-0899299-1
28.	Muhammad Tariq	32302-4890073-5
29.	Muhammad Parvez	32301-4365044-1
30.	Syed Irfan Mehdi	32301-2072338-5
31.	Sajjad Ahmed	32302-4578228-1
32.	Muhammad Waqas	32303-1119009-9
33.	Hafeezullah	32301-0269175-5
34.	Bahadur Abbas	32301-9404522-9

10.5.3 Secondary Stakeholders Consultation

The consultations were carried out with the local government officials. Comments and recommendations of all consulted stakeholders are presented in table below:

S#	Participant	Designation	Concerns/Remarks
Responsible Authority			
1	Mr. Abbas	Inspector Environment	• EMP should be enforced strictly • Proponent should also work for local people benefit • Preventive measures should be adopted to avoid any unfortunate incident • Environmental enhancement measures such as; Tree plantation, monitoring and safety should be ensured
Departments and Agencies			
Agriculture Department			
2	Mr. Khaliq Dad Wattoo	Deputy Director	• He told that potatoes are one of most harvested crop of pakpattan. He had a view that this crop should be properly and hygienically utilized to enhance export of country. • Project will raise living standard
Proponent Environment Management Team			
3 4	Mr. Saleem Khalid Rafiq Mr. Fahad	Proponent EHS Officer	• Local employment will be ensured • Tree plantation will be done to make project environment friendly • No waste will be dumped improperly • No compromise on hygiene • Healthy product supply will be ensured
Environmental Practitioners and Experts			
5	Dr. Muhammad Faqir Irfan	PhD. Environment Lawyer	• Proponent should give preference to the local unemployed youths when employing workers for the project. • Proponent shall follow Environment Protection Act Regulations throughout construction and operation of project
Affected and Wider Community			
6	Mr. Khurram	NGO (Parho Barho Punjab)	• Local employment should be ensured • Proponent shall work for betterment of community

CONCLUSION AND RECOMMENDATIONS

11.1 CONCLUSION

The report presents Environmental Impact Assessment (EIA) of Establishment of Frozen Potato French Fries making unit of **"M/S Rafiq Farm Foods Pvt. Ltd.".** Main objective of said project is to meet the growing demand of Frozen French Fries and to ensure local provision and export of high quality frozen fries.

EIA of Said Project is performed according to guidelines of EPA. It includes description of the project, description of the environmental baselines, potential environmental impacts and suggested mitigation measures. An implementation mechanism for mitigation measures in the form of an Environmental Management Plan is included in the study.

Baseline physical, biological and socio-economic and cultural data and information was collected from a variety of primary and secondary sources, including field surveys, review of relevant literature and online publications. The collected data was used to organize profiles of the physical, biological and socio-economic environments, likely to be affected by the project. Communities were consulted as per public consultation processes including women, men and institutional stakeholders. The aim of public consultation was to assure the quality, comprehensiveness and effectiveness of the EIA; as well as to ensure that the views and opinions of the local people were adequately taken into account in the decision making process.

The performed EIA showed all anticipated impacts (both positive and negative), associated with the project. Appropriate mitigation measures as explained in the environmental study will strengthened the environment and promote sustainable development.

Based on overall assessment of the environmental impact of the project, it is concluded that the economic benefit from the project is not at the cost of environment. The project construction and operation activities can potentially impact the natural resources of the area. These adverse impacts can be largely reduced by implementing the appropriate mitigation measures which has been discussed in this report.

The potential impacts during construction phase includes soil erosion and degradation, soil and water contamination, ambient air quality deterioration caused by the exhaust emission and kicked up dust, noise pollution, damage to local infrastructure, safety hazards, very less loss to the wildlife and natural vegetation and public health concerns for the nearby communities.

The significant environmental management issues during operation phase include Safety hazard, Public Health and Nuisance, air and dust pollution, sewage disposal, solid waste and noise pollutions, vehicular traffic and water consumption.

On the basis of the overall impact assessment, more specifically, nature and magnitude of the residual environmental impacts identified during the present EIA, it is concluded that the proposed project is unlikely to cause any significant, long-lasting impacts on the social, physical and biological environment of the area, provided that the proposed activities are carried out as mentioned in this report, and the mitigation measures and EMP included in this report are completely and effectively implemented.

It is accordingly recommended that Environmental Approval for the project may be issued by the Punjab Environmental Protection Agency

11.2 RECOMMENDATIONS

The Environmental Impact Assessment study and survey results are finally evaluated to recommend the following:

- Implementation of EMP must be given top priority.
- Proper PPEs including ear plugs, ear muffs, mufflers, goggles, gloves and shoes etc. should be provided to workers
- Train workers to use PPEs
- Advise workers to follow SOPs.
- Equipment maintenance and efficiency must be checked.
- No compromise on public health and environment should be allowed.
- Waste minimization practices should be employed and workers should be encouraged to adopt such methods.
- Wages should be distributed on time.

- Proper tree plantation plan should also be developed in order to make the project environment friendly.
- Small waste storage bins should be installed at different corner for proper waste collection and discharge.
- Proper dispensary and first aid box should be provided for workers
- Smoking should be avoided within premises of project site and near fuel storage areas.
- The Security Guards shall also be trained to act in case of all possible emergency situations. The fire alarms can be activated to signal evacuation. At the same time, communication shall be made with hospitals, emergency services and police for urgent support.
- The proposed Environmental Management & Monitoring Plan should be implemented.