

LIST OF ABBREVIATIONS

| | |
|------------------------|--|
| CO₂ | Carbon dioxide |
| dB(A) | A weighted decibel scale |
| EIA | Environmental Impact Assessment |
| EMMP | Environmental Management and Monitoring Plan |
| EMP | Environmental Management Plan |
| Engr. | Engineer |
| EPA | Environmental Protection Agency |
| EPD | Environmental Protection Department |
| EPO | Environmental Protection Ordinance |
| IEE | Initial Environmental Examination |
| Ltd. | Limited |
| LTI | Loss Time Injury |
| LWI | Loss Work Injury |
| m³ | Cubic meter |
| m³/h | Cubic meter per hour |
| MW | Megawatt |
| M/S | Messrs |
| NEQS | National Environmental Quality Standards |
| No. | Number |
| NOC | No Objection Certificate |
| NO_x | Oxides of Nitrogen |
| PEPC | Pakistan Environmental Protection Council |
| PEPA, 1997 | Pakistan Environmental Protection Act, 1997 |

| | |
|-----------------------|---|
| PEPA, 2012 | Punjab Environmental Protection (Amendment) Act, 2012 |
| PEPO | Pakistan Environmental Protection Ordinance |
| PKR | Pakistani Rupees |
| PM | Particulate Matter |
| PPEs | Personal Protective Equipment |
| Pvt. | Private |
| SMART | Self-Monitoring and Reporting |
| SOPs | Standard Operating Procedures |
| SO_x | Oxides of Sulfur |
| WAPDA | Water and Power Development Authority |

EXECUTIVE SUMMARY

INTRODUCTION

The executive summary presents an overview of the main findings of Environmental Impact Assessment (EIA) report for the **Establishment of Asphalt Manufacturing Plant By M/S Nazim & Qasim (Pvt.) Limited** located at Chak No. 170/9-L, Burewala Road, Tehsil Chichawatni, District Sahiwal. The main objective of this project is to fulfill the asphalt market demand for the constructing and maintaining roads, parking areas, railway tracks, airport runways and sidewalks. For this instance, Environmental Impact Assessment (EIA) of the Project has been conducted in accordance with the Punjab Environmental Protection Act 1997 (Amended) 2012 and IEE/EIA Regulations 2022. The process for conducting environmental assessment and the results of EIA are described in this document

M/S **EHS Services** Pvt. Ltd. has been engaged for conducting Environmental Impact Assessment (EIA) for the Establishment of Asphalt Manufacturing Plant of M/S Nazim & Qasim (Pvt.) Limited.

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.

This executive summary presents an overview of the main findings of the EIA Report for the aforesaid project i-e Asphalt Manufacturing Plant of M/S Nazim & Qasim (Pvt.) Limited.

PROJECT OUTLINE (Details are given in Chapter 2)

This report is related to the Establishment of Asphalt Manufacturing Plant having total area of 16.00 Kanals. The main objective of this project is to fulfill the asphalt market demand for the constructing and maintaining roads, parking areas, railway tracks, airport runways and sidewalks. Total cost of

project is approximately PKR 150 million. The said site lies at Latitude 30.365972, and Longitude 72.762194. **Asphalt manufacturing** begins with the **selection of aggregates** such as crushed stone, sand, and gravel, along with bitumen as the binding material. The **aggregates are stored** in separate bins, **dried and heated** in a rotating drum to remove moisture before being **screened and sorted** by size. These **hot aggregates are proportioned** according to the required mix design, while **bitumen is stored** in heated tanks to maintain fluidity. Both materials are then **mixed** in either a batch or drum mixer, ensuring proper coating and uniformity. The finished hot mix asphalt is **stored in silos** before being **transported** in trucks to construction sites.

Salient features of project:

| | |
|--|--|
| Proponent Name: | Muhammad Qasim S/o Sher Muhammad |
| Project Title: | Establishment of Asphalt Manufacturing Plant By M/S Nazim & Qasim (Pvt.) Limited |
| Project Location: | Chak No. 170/9-L, Burewala Road, Tehsil Chichawatni, District Sahiwal. |
| Name of organization preparing report | EHS Services Pvt. Ltd. |
| Total Land Area | 16.00 Kanals |
| Cost | 150 million |
| Capacity | 200 Ton/hr |
| Products | Asphalt. |
| Source of Water | Groundwater |
| Nearest Industry | U-Gas LPG Plant (0.15km) |
| Source of Power: | WAPDA Supply generators |
| Wastewater: | Wastewater is mainly generated from equipment washing, aggregate dust suppression and cooling processes. It will be disposed off after Treatment |

| | |
|--------------------------------|---|
| | effluent treatment plant. Municipal sewerage is disposed off as per area practices. |
| Solid Waste Management: | Solid waste is mainly generated from aggregate dust, rejected or leftover asphalt mix, and packaging materials such as bitumen drums or bags. Most of this waste is recyclable—dust and fines are often reintroduced into the mix, Damaged or excess asphalt is commonly reused in new asphalt production. Domestic waste will be handed as per area practices. |

MAJOR IMPACTS AND RECOMMENDED MITIGATION MEASURES:

Beneficial/Positive Impacts:

- The establishment of the said project will contribute to enhancing Pakistan’s domestic productivity, and help diversify Pakistan’s economy
- Provision of employment and stimulation of local economy.
- Provision of local high quality asphalt
- 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.

Negative Impacts:

| Impacts | Mitigation measures |
|-------------------------------------|---|
| Construction/Extension phase | |
| Dust emissions | Most of the dust generating activities during construction lasts for a brief period. Thereafter, vehicular movement generates most of the dusts. Dusts will be suppressed using water bowser to spray exposed land surfaces and particularly areas likely to be disturbed |

| | |
|---------------------------------|--|
| | <p>by trucks and other vehicles during the construction of the factory premises. Vehicular speed limits of 20 km/h will be ensured in order to minimize dust generation. Further mitigation measures will be:</p> <ul style="list-style-type: none"> • Covering haulage vehicles transporting aggregate, soil and cement • Covering onsite stockpiles of aggregate, cement, soil, etc. • Providing workers with the necessary Personal Protective Equipment (PPE) e.g. dust masks and ensure that they are worn • Operating well maintained vehicles and equipment |
| Wastewater | <ul style="list-style-type: none"> • Portable toilets with the septic tank were provided to workers during construction phase |
| Impacts of accidental spillages | <ul style="list-style-type: none"> • The integrity of storage facilities will be ensured • Drip pans will be made available where necessary |
| Safety | <ul style="list-style-type: none"> • Safety signage will be put in relevant places within the construction site • Reckless driving by construction workers will be prohibited and monitored. • Workers will be given PPEs such as; helmets, mask, ear-plugs/muffs, safety boots, safety goggles, safety jackets, harnesses etc. and its use will be strictly enforced • Workers will be trained on regular basis regarding personal safety • Incidents will be reported directly to the concerned authority |
| Solid waste management | <ul style="list-style-type: none"> • Recycling or reuse of waste wherever possible. |

| | |
|---|--|
| | <ul style="list-style-type: none"> • 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 as per practices of area • 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 |
| Operation Phase | |
| Particulate emissions and generator stack emissions | <ul style="list-style-type: none"> • No air emission is likely to be released during operation of the project; except the dust or PM to be produced during floor cleaning and other such operations, which also will not be posing any environmental threat (will not breach the safe standards). Wet suppression is done to control dust emissions. Generator emissions will be controlled by providing proper enclosure, tuning and maintenance. |
| Degradation of surface waters quality due to process water and sewage direct disposal | <ul style="list-style-type: none"> • Wastewater is mainly generated from equipment washing, aggregate dust suppression and cooling processes. • It will be disposed off after Treatment effluent treatment plant. Municipal sewerage is disposed off as per area practices. |
| To minimize loss work injury/hazards/incidents/accidents | <ul style="list-style-type: none"> • Training regarding EHS should be given on the regular basis |

| | |
|--|--|
| | <ul style="list-style-type: none"> • 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 • Incidents should be reported directly to the concerned authority |
| <p>To minimize disturbance of communities due to noise</p> | <ul style="list-style-type: none"> • All the machinery will be installed and operated in a closed hall and from operation of machinery noise will not be a problem for the residents in the area nearby. Further Administration of the unit will take the precautionary measures to avoid the noise emissions. There is no possibility of Noise pollution • A thick greenbelt will be developed all around the plant which will be acting as noise barrier. • 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. |
| <p>Solid waste management</p> | <ul style="list-style-type: none"> • Solid waste is mainly generated from aggregate dust, rejected or leftover asphalt mix, and packaging materials such as bitumen drums or bags. Most of this waste is recyclable—dust and fines are often reintroduced into the mix, Damaged or excess asphalt is commonly reused in new asphalt production • Domestic waste will be handed as per |

| | |
|--|----------------|
| | area practices |
|--|----------------|

PURPOSED ENVIRONMENTAL MANAGEMENT & MONITORING PLANS:

During construction, ambient air quality for dust level in particular noise level (tests), solid waste management and soil contamination, and community and workers' safety (visual) need to be monitored. During operation, stack emissions, noise level, air quality, wastewater quality and workers' safety need to be monitored. Plan has been included in **Chapter-6** of this EIA Report.

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1 CHAPTER 1: INTRODUCTION

As per PEPA 2012 and the IEE/EIA Regulations, 2022 it is mandatory for the proponent of any development project to obtain Environmental Approval from EPA Punjab by filing an IEE or EIA as the case may be, before the Agency. This Report presents the Environmental Impact Assessment (EIA) for aforesaid Asphalt Manufacturing Plant.

For this purpose, the proponent has engaged environmental consultants, **M/s EHS Services**. 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 with the aim to find out appropriate measures for their mitigation, to either eliminate those impacts or to bring them to acceptable level and formulate Environmental Management Plan (EMP) for implementation of the project in environment-friendly manner.

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

1.1 THE PROPONENT

| | |
|----------------|--|
| Name | Muhammad Qasim S/o Sher Muhammad |
| Address | Al-Farid Garden, House No. 93, Block-E, Pakpattan |

1.2 THE PROJECT

1.2.1 Nature of Project

The Said Project is the Establishment of Asphalt Manufacturing Plant of M/S Nazim & Qasim (Pvt.) Limited. Its salient features have been described later in this Chapter, Chapter 2 and briefly in Executive Summary of this EIA Report.

1.2.2 Location of Project

Said project will be located at Chak No. 170/9-L, Burewala Road, Tehsil Chichawatni, District Sahiwal.

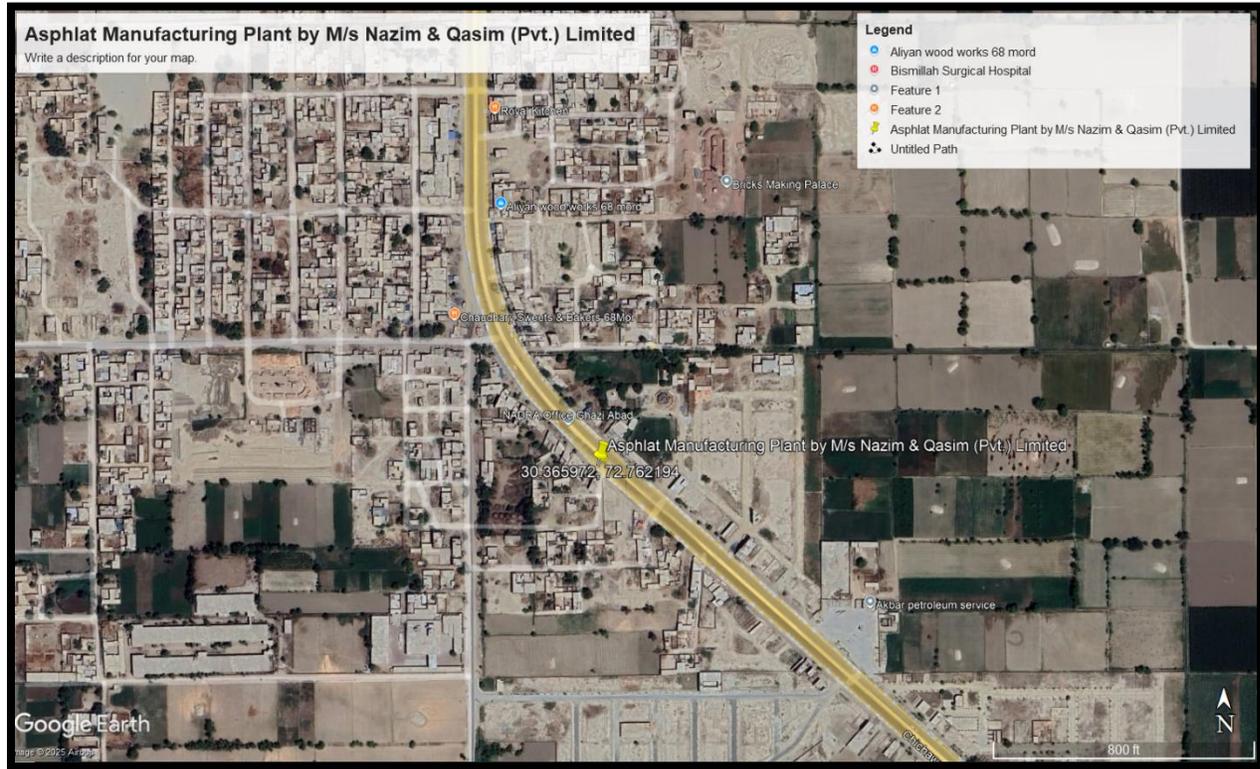


Figure 1-3: Location Site

1.2.3 Total area

Total area of land is approx. 16.00 Kanals.

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

Contact Details:

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

Study team:

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

Table 1-1: List of Experts

| Sr. # | Name | Qualification | Role |
|------------------|---------------|----------------------------|------------------------|
| Engineers | | | |
| i. | Engr. M. Asif | M.Sc. Chemical Engineering | Monitoring and Testing |
| ii. | Engr. Muzna | M.Sc. Environmental | Designing and |

| | | | |
|-------------|----------------------|------------------------------------|--|
| | Manzoor | Engineering | 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 REPORT

The development 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 and commencement 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, 2022 provided the guidelines for categorizing the Projects. 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.

1.5 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;

- Description of the Project
- Description of Environmental and Social Conditions
- Assessment of Environmental Impacts and Mitigation Measures
- Mitigation Measures for Identified Impacts
- Public Consultation
- Environmental Management and Monitoring Plan (EMMP)
- Recommendations and Conclusions

SCREENING & SCOPING

Screening

As per Review of Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) Regulations, 2022 the Said Asphalt Manufacturing Plant falls under **Schedule-II** i.e., the project requiring an EIA study and **Sub- category J** (Other Projects).

Scoping

Temporal and Spatial Boundaries:

Temporal Boundaries:

Construction period of said project is approx. 2 years. Operation Lifespan will be more than 25 years.

Spatial Boundaries:

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.

Important issues and concerns raised during consultation

- 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
- Tree plantation must be ensured
- Local employment should be ensured
- Proponent shall work for betterment of community

- All emissions and effluents shall be managed properly to avoid public nuisance.

Significant Impacts identified in scoping:

| Construction Phase | Operation Phase |
|---------------------------------|--|
| Dust emissions | Particulate emissions |
| Wastewater | Degradation of surface water quality due to process water and sewage direct disposal |
| Impacts of accidental spillages | Work injury/hazards/incidents/accidents |
| Safety | Disturbance of communities due to noise |
| Solid waste management | Solid waste management |

ALTERNATIVES

Site Alternatives

Said project is the establishment of M/S Nazim & Qasim (Pvt.) Limited. Selected site is surrounded by other industries and no other alternative site is considered for Said Project. The site is well located in regard to the following:

- Within vicinity of existing unit
- Plot near other industries
- Easy road access to the market
- No settlements in close vicinity
- No watercourse within a safe distance
- No ecologically sensitive or declared protected area within safe radius of the selected site

In view of these facts, it can be concluded that the Selected Site is best suited for the project, and will not pose any adverse impact or threat on any component of the environment.

Distance of selected site from different receptors is as follows:

| Sr. No | Receptors | Distance (Km) |
|--------|--------------------|---------------|
| 1 | Ugas LPG Plant | 0.71 |
| 4 | Bismillah Hospital | 0.50 |
| 5 | Govt. School | 1.73 |
| 6 | Burewala Road | 0.11 |
| 7 | Chak 164A/9L | 1.72 |

Considering the facts that said site is at a safe distance from sensitive receptors. The said site has advantage of not only to be environment friendly but also potentially sound to enhance sustainable development in the region. Therefore, given site is the most suitable for establishment of said project.

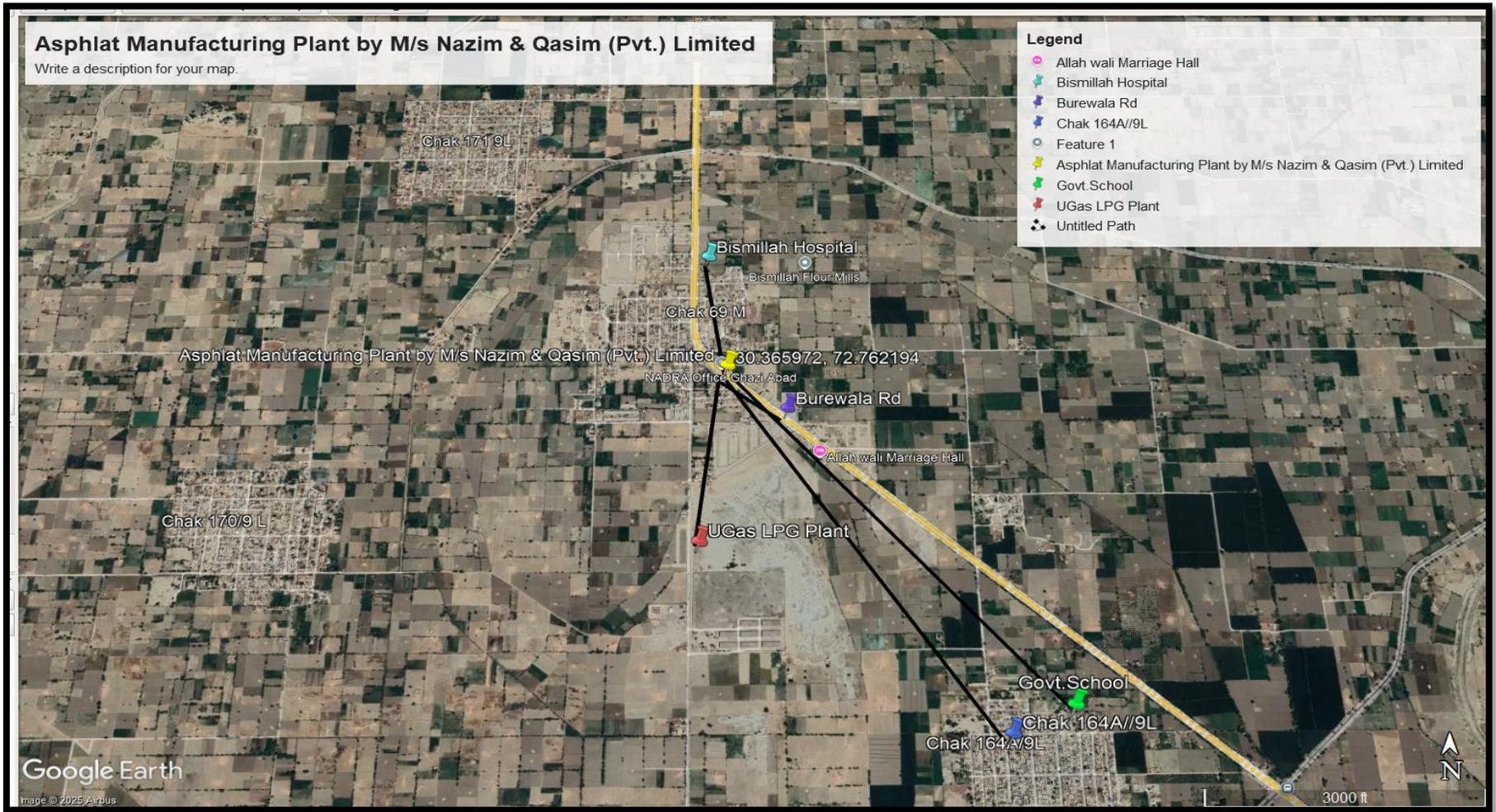


Figure 1-1: Distance of site from nearest receptors

2 CHAPTER 2: DESCRIPTION OF PROJECT

2.1 GENERAL

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

2.2 TYPE AND CATEGORY OF PROJECT

As per Review of Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) Regulations, 2022 the Said Asphalt Manufacturing Plant falls the said project falls under category. i.e., the project requires an EIA study

2.3 OBJECTIVES OF PROJECT

The primary objectives of said project are to:

- To fulfill the asphalt market demand for the constructing and maintaining roads, parking areas, railway tracks, airport runways and sidewalks
- Create new employment opportunities as a part of the project activities.

2.4 LOCATION AND LAYOUT OF PROJECT

2.4.1 Location of the Project

Said Project site is located at Chak No. 170/9-L, Burewala Road, Tehsil Chichawatni, District Sahiwal. The said site lies at Latitude 30.365972 and Longitude 72.762194.

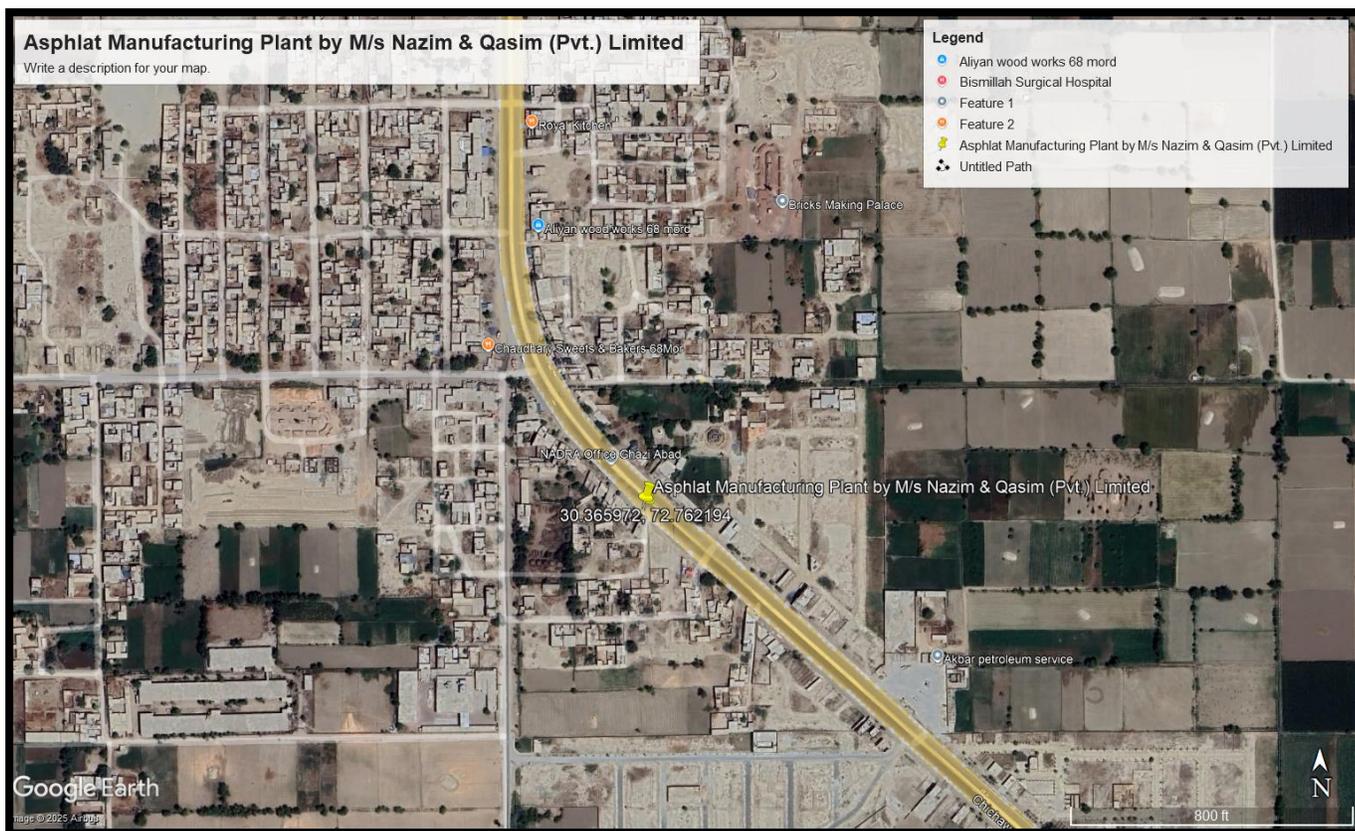


Figure 2-1: Location Map of the Site

2.5 GOVERNMENT APPROVALS

After acquiring the environmental approval proponent will apply for other approvals.

2.6 LAND USE ON SITE

Land is under the ownership of proponent property document are attached as annexure. Minor renovation will be done and machinery will be installed for operation of said industry.

2.7 ROAD ACCESS

The site is approachable via Burewala Road at 0.11km.

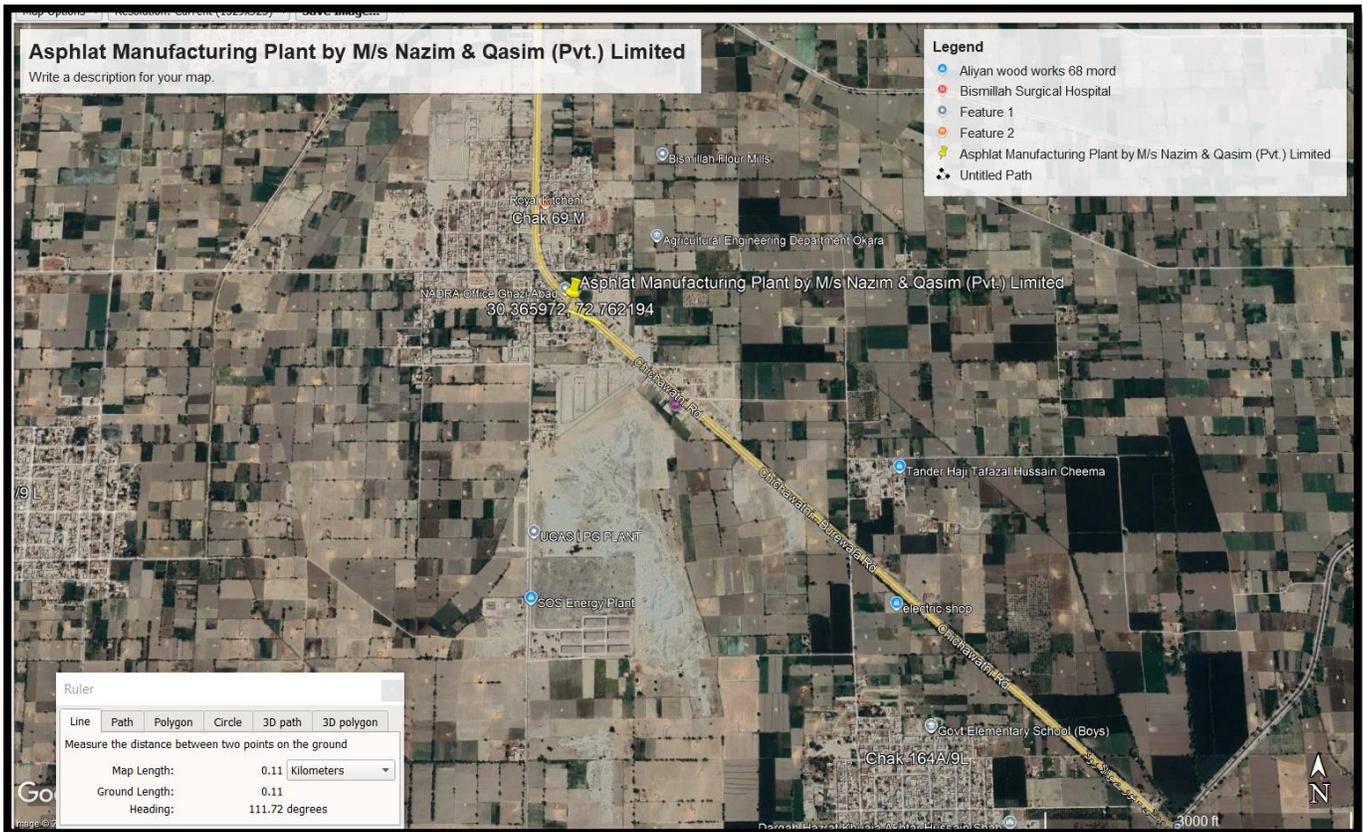


Figure 2-2: Road Access

2.8 VEGETATION FEATURES OF SITE

Various local plants are grown at the project site in the open areas, and along the boundary.

2.9 RESTORATION AND REHABILITATION PLANS

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.
- Site for construction camps should be restored to its previous conditions as much as possible.
- 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.

There exists no human settlement within safe radius of the selected project site to be displaced owing to the commencement of the said Project. No structure of any significance stands at the site to be relocated or dismantled. Nearest residence from project site is:

| Residence | Distance |
|---------------------|---------------|
| Chak 164A/9L | 1.71km |

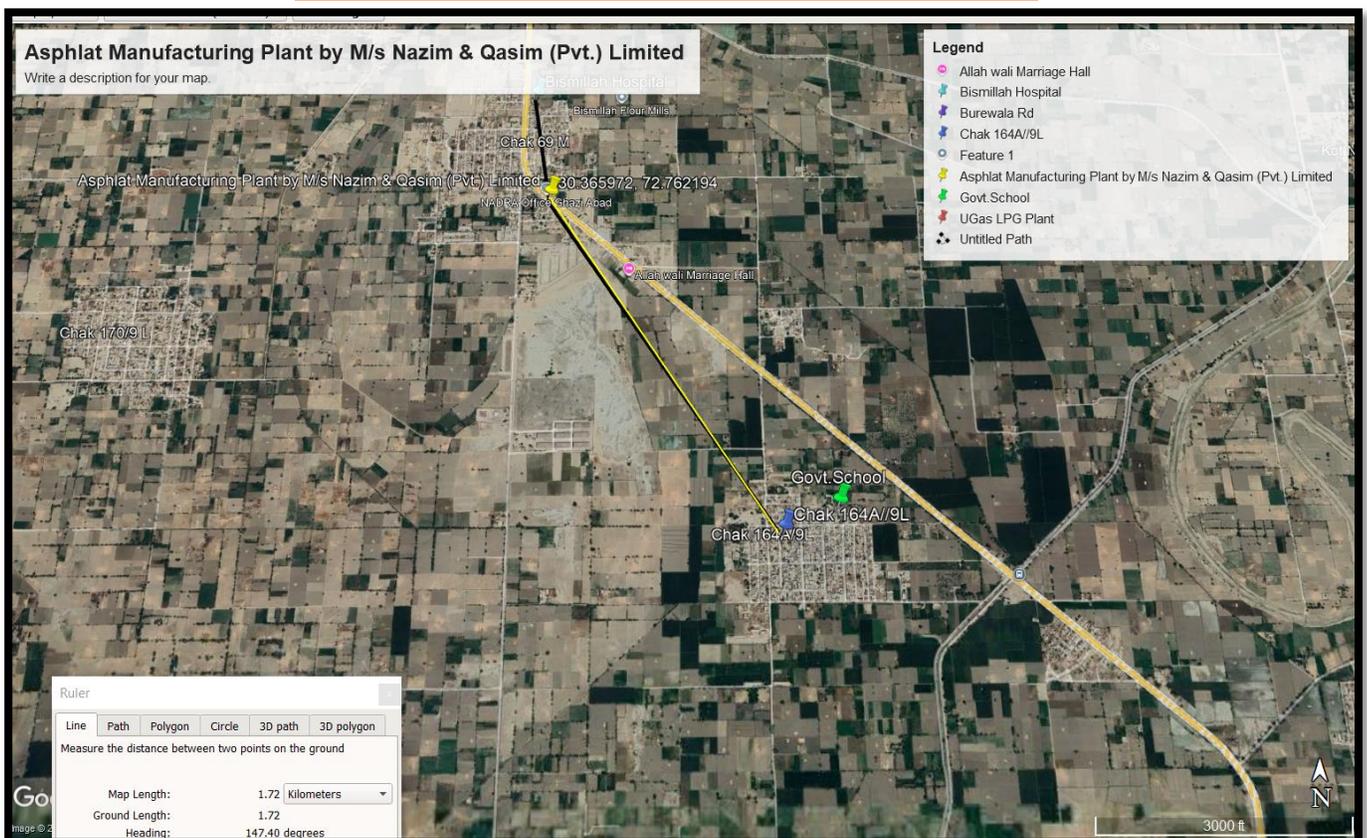


Figure 2-3: Distance of site from nearest residence

2.10 DESCRIPTION OF PROJECT

2.10.1 Raw Material and products

Raw Material

- Bitumen
- Aggregates

Product =

- Asphalt

2.10.2 General Process

Nazim & Qasim (Pvt.) Limited. is involved in manufacturing of asphalt for market demand. Generalized procedure for manufacturing of asphalt is given below:

2.10.3 Step 1 – Cold Feed Bins

Aggregate cold feed bins hold the necessary aggregates to produce asphalt. At this point the aggregates are cold and wet. Then, aggregates are conveyed to the dryer.

2.10.4 Step 2 – Drying

The drying process is designed for three purposes:

- To take moisture away from the aggregates.
- To heat up the aggregates. This is important when all the ingredients are put together as the high temperature will give workability to the mix.
- Take very fine aggregate through the air and reuse it as filler in the final mix.

2.10.5 Step 3 – Hot Elevator

After the aggregates are heated up, they are transported through an elevator. It also helps to transfer the heat throughout the aggregate.

2.10.6 Step 4 – Screening

At the top of the plant, the aggregate is divided by size. Each screen has holes of different sizes, allowing the aggregate to filter properly. The rocks that are too big are sent down through the right side elevator.

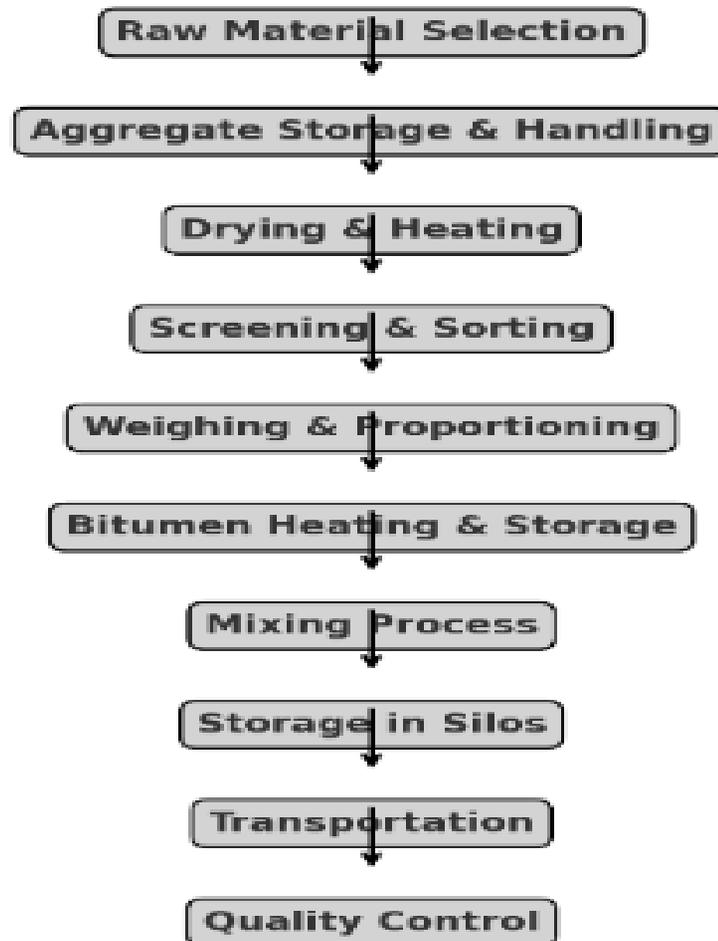
2.10.7 Step 5 – Mixer

The aggregate has been divided in four sizes. The sizes of aggregate used in the mix will depend on the type of asphalt to be prepared. Recycled Asphalt is conveyed into the mixer. Bitumen is added to the mix from the tanks.

2.10.8 Step 6 – Transport to Site or Hot Storage

The asphalt is now ready to be transported to the working site or hot storage

Asphalt Manufacturing Process Flow Chart



2.11 SUPPLIES.

2.11.1 Manpower(Direct & Indirect)

The Project requires manpower during both the construction and operational phases. During construction phase 20-30 workers were involved. During the operation phase of the project, the total manpower requirement is estimated to be 80 people (Both Direct & Indirect) comprising administrative, technical, and non-technical persons. These include chemists, computer 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.

2.11.2 Firefighting, evacuation plan, Health & Safety and HVAC plan

The fire-fighting system includes water and gas devices / extinguishers. Plant has established a proper fire-fighting system. Indoor and outdoor fire hydrants are installed according to the codes and standards.

A proper evacuation plan is formulated to cope with any emergency situation. Assembly points are set and marked. Fire frightening and emergency plan is mentioned in layout plan.

2.11.3 Electricity

WAPDA will be the main source of electricity for the said unit. Stand-by generator will provide electricity for this Unit in load-shedding conditions. one standby diesel fired generator are also provided in existing unit.

2.11.4 Water supply

The water requirement for the project includes drinking water, Process water and water for fire hydrants. Ground water supply is used to fulfill this demand.

2.11.5 WASTEWATER

Wastewater is mainly generated from equipment washing, aggregate dust suppression, and cooling processes. It will be disposed off after Treatment effluent treatment plant. Municipal wastewater generator from domestic use and cleaning is disposed off as per area practices.

2.11.6 AIR EMISSIONS

No air emission is likely to be released during operation of the project; except the dust or PM to be produced during floor cleaning and other such operations, which also will not be posing any environmental threat (will not breach the safe standards). Wet suppression is done to control dust emissions. Generator emissions will be controlled by providing proper enclosure, tuning and maintenance.

2.11.7 NOISE

All the machinery will be installed and operated in a closed hall and from operation of machinery noise will not be a problem for the residents in the area nearby. Further Administration of the unit will take the precautionary measures to avoid the noise emissions. There is no possibility of Noise pollution.

2.11.8 SOLID WASTE

Solid waste is mainly generated from aggregate dust, rejected or leftover asphalt mix, and packaging materials such as bitumen drums or bags. Most of this waste is recyclable—dust and fines are often reintroduced into the mix, Damaged or excess asphalt is commonly reused in new asphalt production. Domestic waste will be handed as per area practices. For collection of solid waste dust bins are kept in the unit premises to manage the waste.

2.11.9 AREA

Total Area of the said project is 16.00 Kanals.

2.11.10 COST AND MAGNITUDE OF OPERATION

Cost of project is approx. PKR 150 million Raw Material, Operation and maintenance of the Production machinery are the costly activities involved in the operation phase of the project. Equipment safety will be assured if these operations are carefully managed. No separate fund allocation is required. However, budget will be allocated for purchase and maintenance of standardized PPEs for workers and for waste management and environmental enhancement. Despite these costs, this project was found to be financially feasible in the feasibility report. Magnitude of operations includes:

1. Applying for and getting all necessary approvals and contracts
2. Construction of boundary wall and other structures
3. Installation of machinery
4. Installation of firefighting equipments
5. Marking of emergency exits, assembly points
6. Tree plantation and land-scapping

Cost Breakup

| Operation | Cost |
|-------------------|-------------|
| Land Cost | 50million |
| Construction Cost | 50 million |
| Machinery Cost | 50million |

2.11.11 SCHEDULE OF IMPLEMENTATION

The project extension intends to take 6 months from start to completion.

| Sr. # | Activities | 6 Months | | | 6 Months | | | 6 Months | | | 6 Months | | |
|--------------|--------------------|-----------------|----|----|-----------------|----|----|-----------------|----|----|-----------------|----|--|
| | | 2M | 2M | 2M | 2M | 2M | 2M | 2M | 2M | 2M | 2M | 2M | |
| 1 | Detailed Designing | | | | | | | | | | | | |

| | | | | | | | | | | | | | |
|----------------|---|--|--|--|--|--|--|--|--|--|--|--|--|
| 2 | Mobilization of Contractors | | | | | | | | | | | | |
| 3 | Lean Construction Period | | | | | | | | | | | | |
| 4 | Peak Construction Period | | | | | | | | | | | | |
| 6 | Installation of machinery | | | | | | | | | | | | |
| 7 | Installation of firefighting equipments & emergency exits | | | | | | | | | | | | |
| <i>M=Month</i> | | | | | | | | | | | | | |

3.2.2 Geography

Sahiwal town is situated at a distance of about 18 miles from the left bank of the river Ravi, 187 Km west of Lahore and 200 km east of Multan. The Grand Trunk Road and the main railway line connecting Peshawar-Lahore with Karachi pass through the town. The Lower Bari Doab Canal separates the town into two parts. Its approximate height above sea level is 500 feet. Sahiwal lies 30°39'52.16" N latitude and 73°6'30.54"E longitude.

Geologically the area does not have any outstanding features. Saltpeter, which is made from saline earth called kallar, is found when the water table is high. In the east of the town it is found to consist of common salt mixed with a less quantity of sulphate of soda and addition very small quantity of lime and magnesium salt.

3.2.3 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. Synclinal 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.

3.2.4 Seismicity 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.

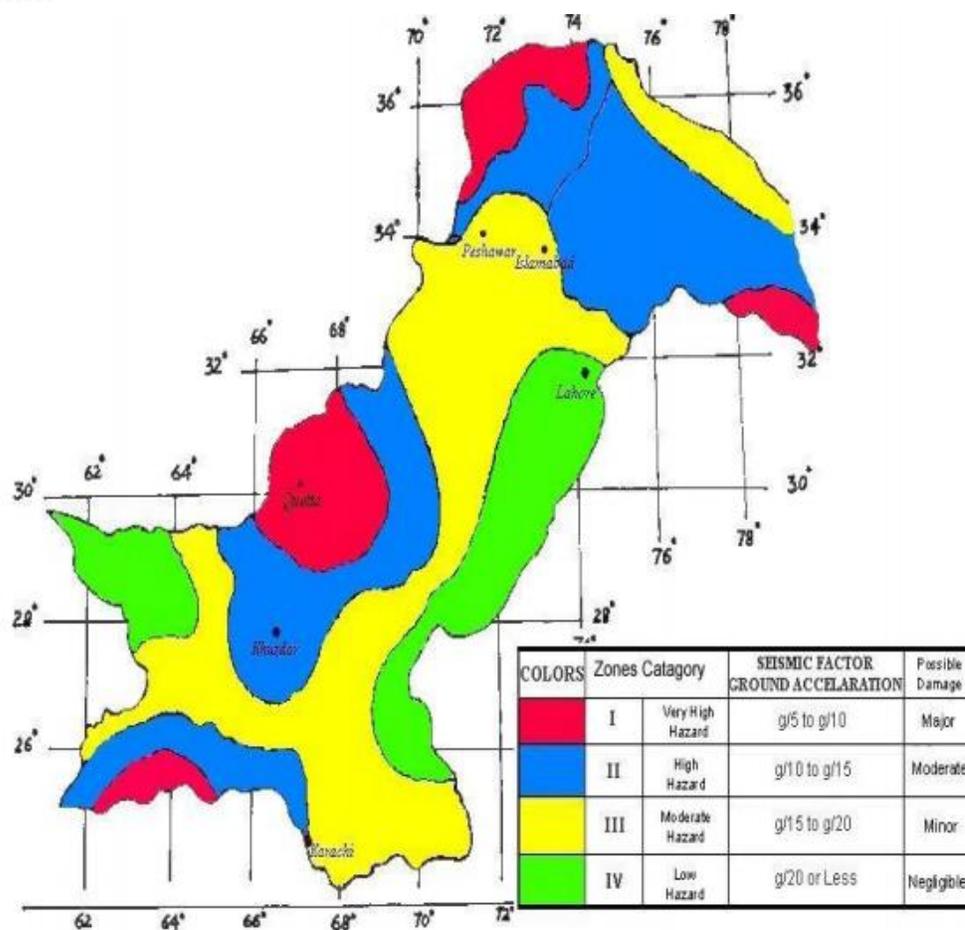
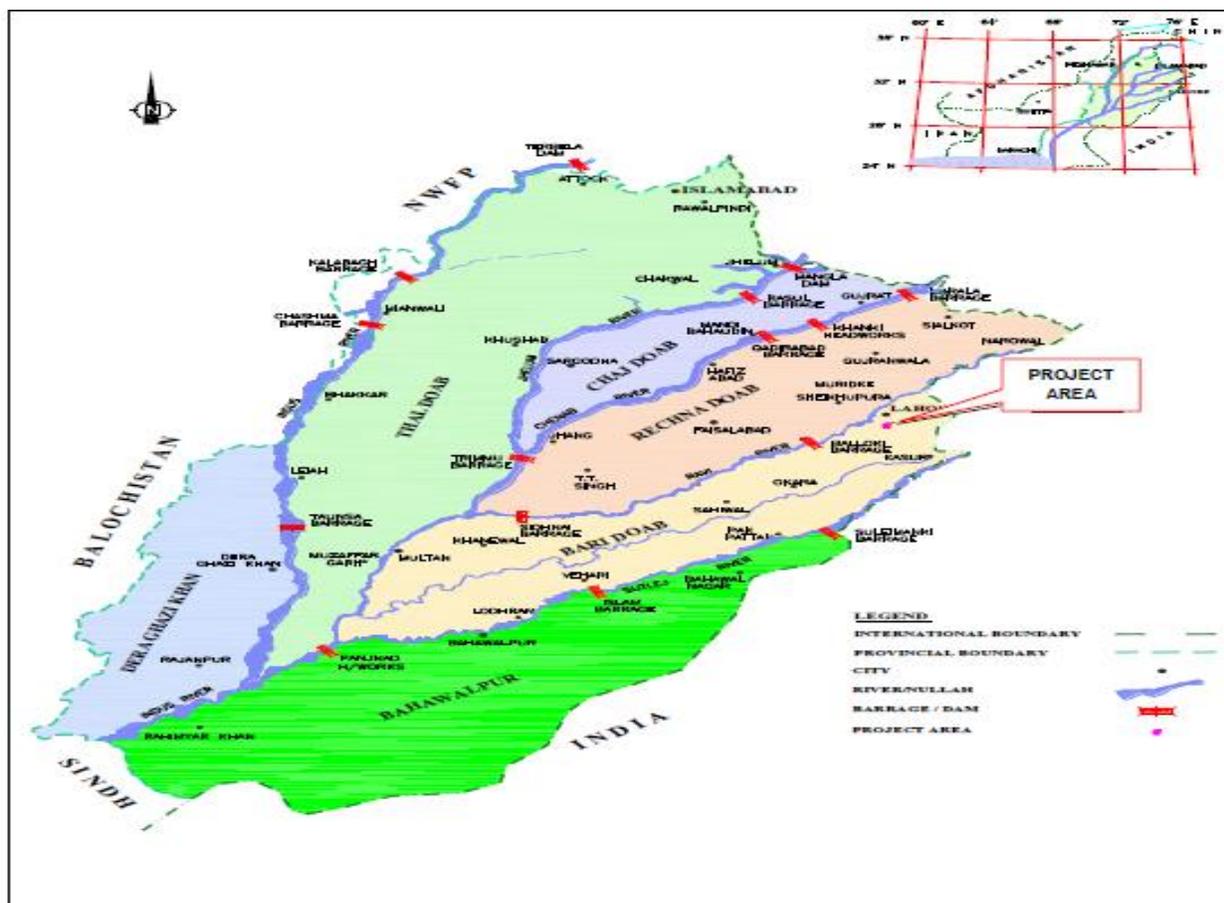


Figure 3-1: Seismic Zoning of Pakistan.

3.2.5 Hydrology and ground water

The Study Area forms the upper part of Punjab plain, which is a part of the Indo-Gangetic depression. This depression is of a synclinal nature. Synclinal depression is a fore deep downward of the Himalayan foreland of variable depth, converted into flat plains by simple process of alluvial deposition. It is part of the large inter alluvial upper Bari Doab, which is bounded by the Ravi River in northwest and the Sutlej River to the southeast. The Bari Doab along with other Doabs like Rechna, and Chaj form the vast alluvial plain of the upper Indus Plain in Punjab.



3.2.6 Climate

The climate of Sahiwal district is extreme, reaching 34 °C in summer, and down to 4 °C in winter. The soil of the district is very fertile. The summer season starts in April and continues till October. May, June and July are hottest months. The average rainfall is about 200 mm. The Project Area experiences very light rainfalls. The summer season continues from July to September and the winter season from December to April. The bulk of the monsoon precipitation occurs in July and August.

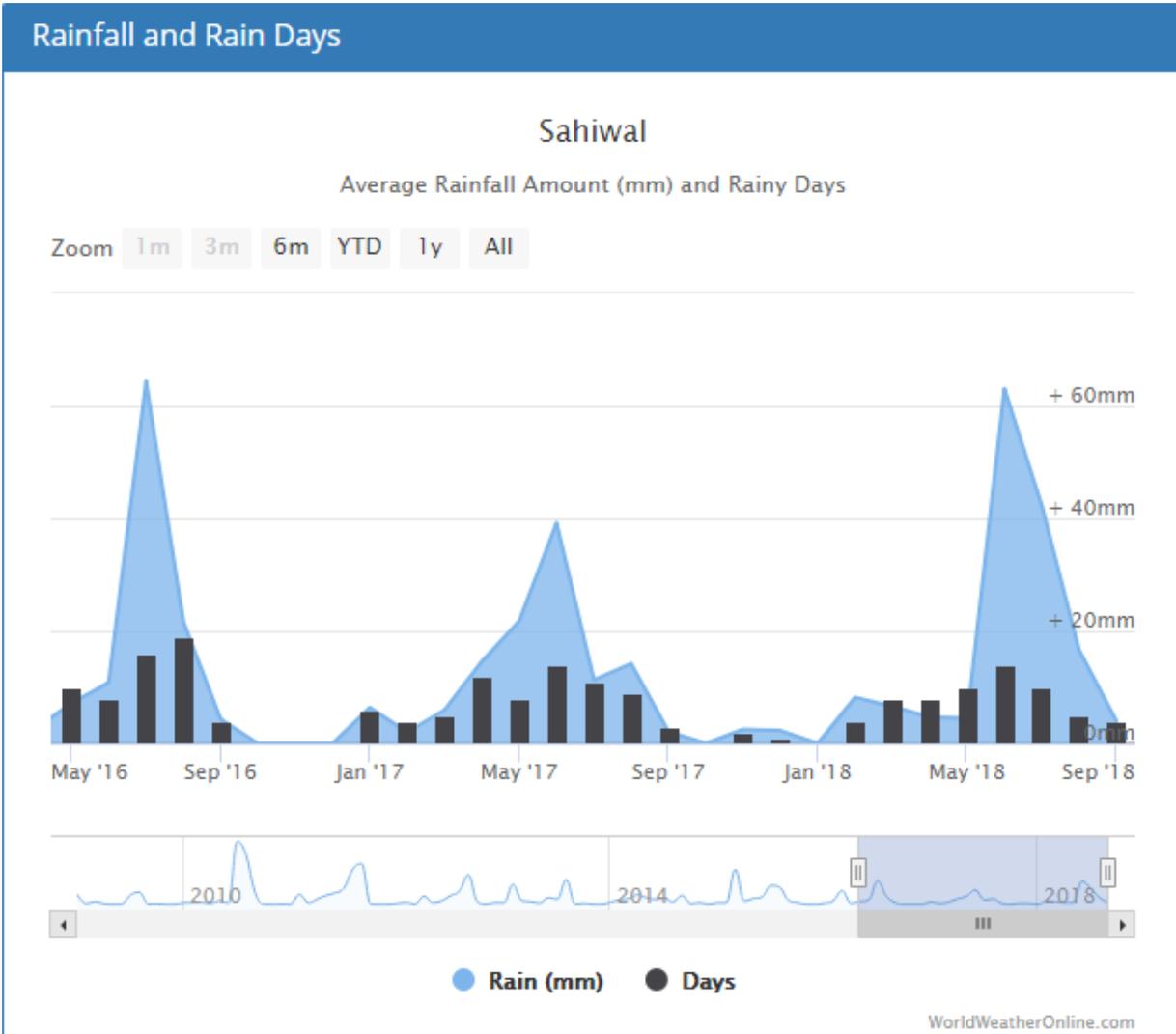


Figure 3-2: Rainfall and Rain days in Sahiwal

Reference: Medium Term Integrated Climate Resilient Urban Infrastructure Investment Program and Pre-Feasibility Study. A study of Urban Unit

3.3 Baseline Environmental Quality

3.3.1 Ambient Air Quality

The degradation of air quality in large cities is a predominant environmental concern these days.

Project Site

The Ambient Air Quality report has been attached as Annexure IV of this

report.

3.3.2 Ambient Noise Level

Noise is considered to be a source of environmental pollution even though it is contemplated to be less damaging for humans when comparison is made with water, air or land pollution.

Project Site

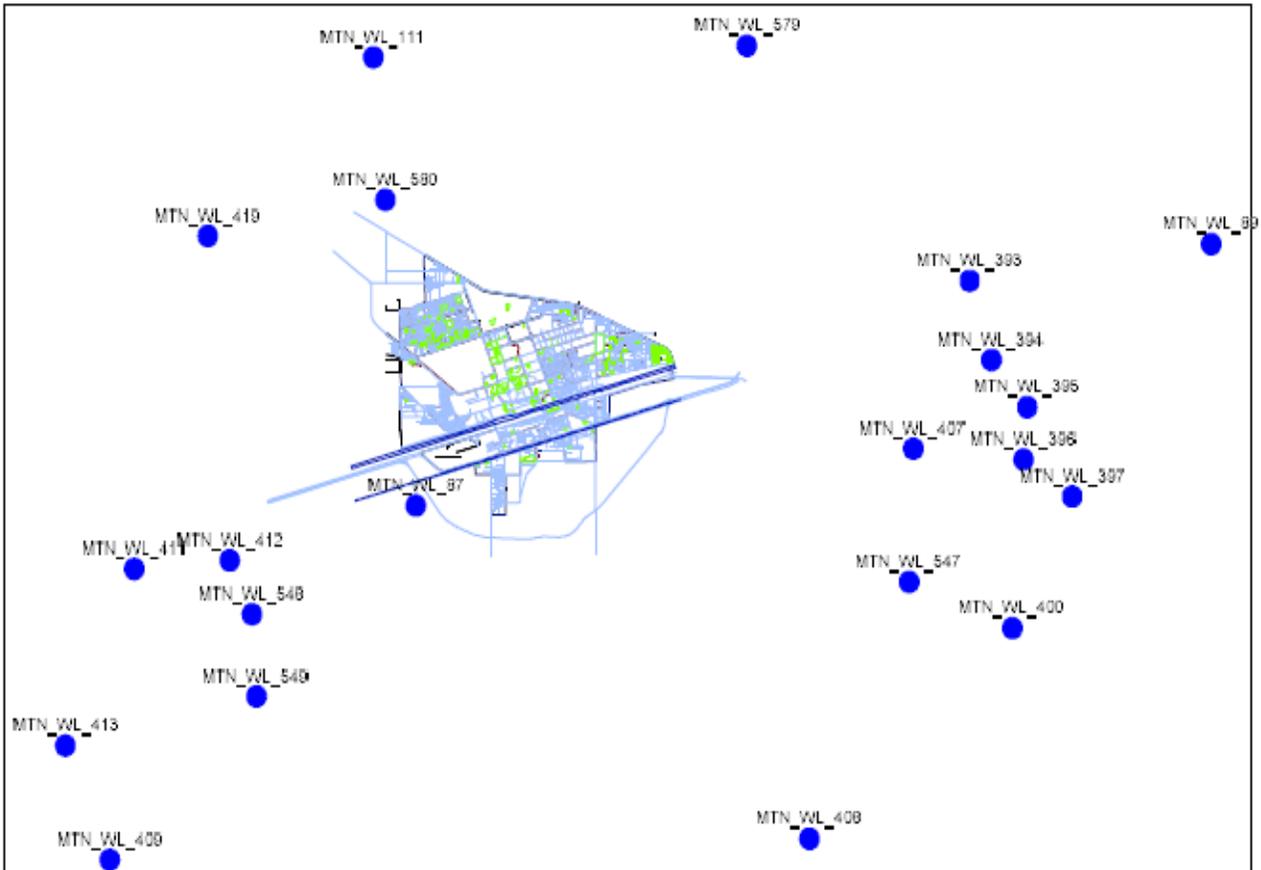
Noise monitoring report of the proposed project site has been attached in the Annexure IV of this report.

3.3.3 Water Quality

Groundwater is the only source of portable water in Sahiwal City. Good quality water is abstracted from the sandy deposits below 30 feet that vary from fine to coarser material having layers of calcareous kankar modified by limestone / sandstone weathering. Lithological logs of test holes (180–300 m deep) and test tubewells (30–110 m deep) indicate that Bari Doab consists of consolidated sand, silt and silty clay, with variable amounts of kankers (Basharat et al., 2013). Within the middle zone, where Sahiwal is situated, silt/clay layers tend to be thinner and distributed unevenly, both vertically and horizontally.

The water table average is about 40-50 feet below the ground level and upper level produce limited quantities of mineralized water. At depths of 450-500 feet greater quantities of good quality ground water are available and this is where the city's supplies are derived (GHK, 2010).

Groundwater is the only source of portable water in Sahiwal City. Punjab Irrigation Department (PID) maintains the groundwater monitoring wells in the area. The locations of these wells are shown in Figure 3-4 and the latest reported groundwater depths are presented in Figure 3-5. It can be seen that the recent groundwater depth below the city is around 12 meter bgs.



Source: Punjab Irrigation

Figure 3-3: Location of Wells

Reference: Hydrology and Modeling for Climate Risk and Vulnerability Assessment (CRVA) Pre-Feasibility Study for Sialkot and Sahiwal Cities by ADB.

Project Site:

As Groundwater is the only source of portable water in Sahiwal so water from depth of 250ft will be used. Water Quality report of the proposed project site has been attached in the Annexure IV of this report.

3.4 Biological Environment

3.4.1 Flora

The climate of Sahiwal district is extreme. The original flora of the area consists of usually hard wooded species. The trees have usually short holes and low branching crowns, which rarely meet except on exceptionally

favorable spots. At present, there is generally a mixture of species. The area has been used for agricultural purposes for almost a century. Natural vegetation including Sacred fig (Peepal), Banyan (Bargad), Eucalyptus (Safaida), Salvadora, Persica (Peelu), Prosopis cineraria (Jundi), Sal, Tecomella undulata (Okaan), Dalbergia, sissoo (Shisham), Acacia nilotica (Kikar or Babul), Azadirachta Indica (Neem), and Melia azedarach (Bakain)

Before canal irrigation was introduced in the district Sahiwal the only trees were those characteristics of Bar lands Jand, Vann, Okan, Karir. But since colonization all these species have gradually made way for the more useful and valuable Sheesham and Kikar.

Reference: Punjab Cities Improvement Investment Program, Sahiwal City Profile, The Urban Unit and P&D Department, Punjab

3.4.2 Fauna

Fauna and flora are an essential part of the environment and depend on each other in many ways and as the flora is not only plentiful, but also enriched with lush green crops. The fauna of the area comprises mammals, reptiles and birds etc.

No wild animal is found in this district. However, jackal, wolf and fox are found in some part of district. Wild boar is also found near the river banks. In Sahiwal important Livestock Breeds are Cattle= Sahiwal, Buff = Nili Ravi, Goat = Beetal and Sheep =Lohi.

Reference: Punjab Cities Improvement Investment Program, Sahiwal City Profile, The Urban Unit and P&D Department, Punjab

3.4.3 Protected areas / National Sanctuaries

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

3.5 SOCIOECONOMIC ENVIRONMENT

This section provides collective information about the existing socio-economic and environmental condition of the project area within the AOI. The different

types of socio-economic aspects were covered such as demographic profile, occupation, education and health facilities. This data helped in identifying major interventions for the development of Environmental Management and Monitoring Plan (EMMP). The study also helped to assess the positive or adverse impacts on local community.

3.5.1 Socio-Economic Environment

3.5.2 Industries

The Most famous industries lying in this area include Cotton, and Textile, Beverages, flour & Cottage Industries, automobiles industry, pipe industries are the most important industries playing fundamental role in the economy of the area.

Industries nearby site are:

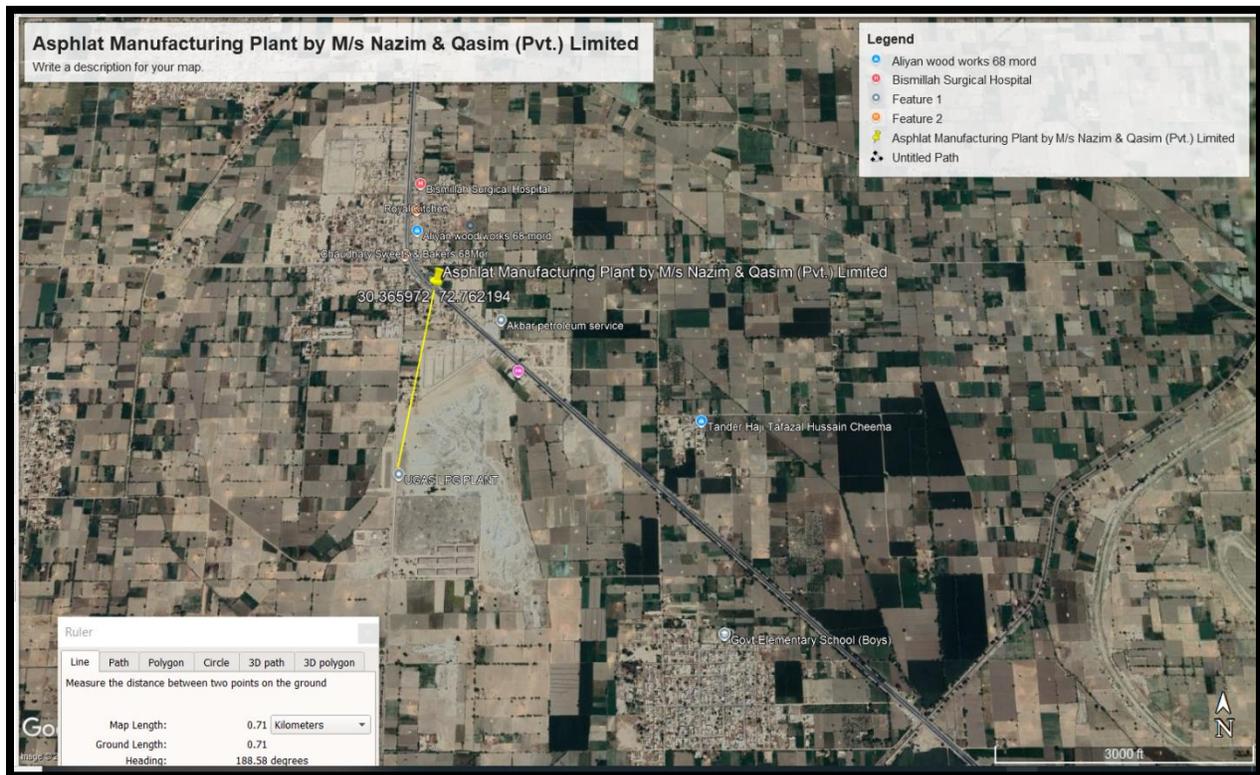


Figure 3-4: Industries nearby site

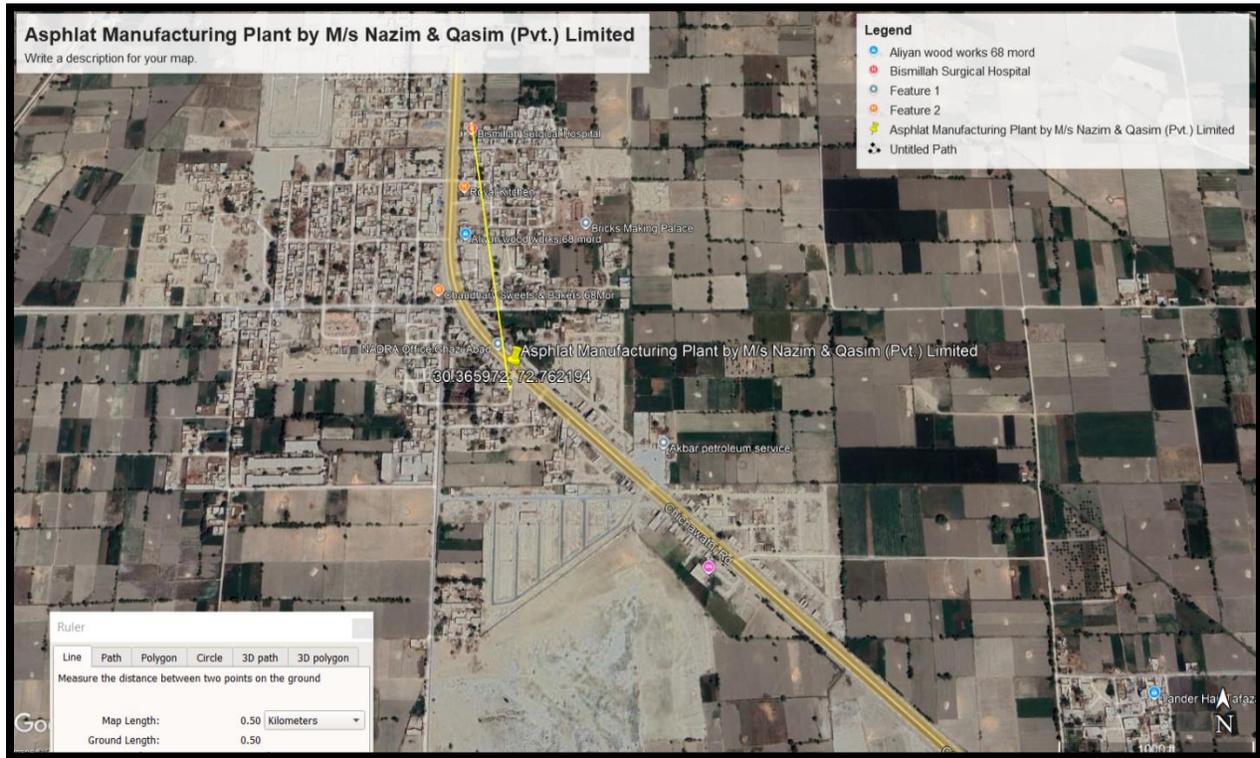


Figure 3-6: Hospitals nearby site

3.6 QUALITY OF LIFE VALUES

Socio-Economic Questionnaire and Environmental Checklist were used as survey tools by the HSE Services to collect desired information. Graphical representation of results of Socio-Economic Survey is given below:

3.6.1 Occupation of Respondents

Majority of the respondents (70%) are attached with jobs, 15% shopkeepers and remaining 15% are labors. During survey, efforts were made to interact with people representing all walks of life. The detailed graphic representation of occupational status is given below:

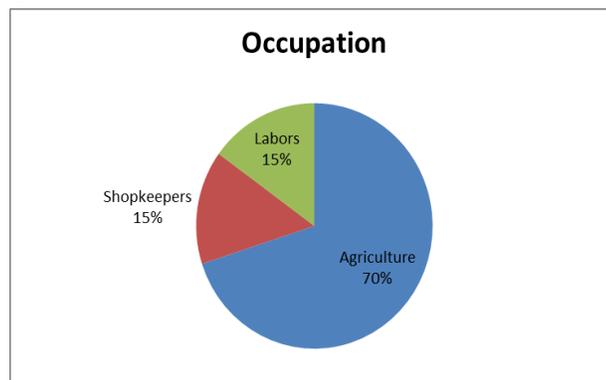


Figure 3-7: Occupation of Respondents

3.6.2 Literacy Rate

From survey results, it was found that 75 % of the studied population was illiterate, 15% was up to primary level, 10% studied up to middle level.

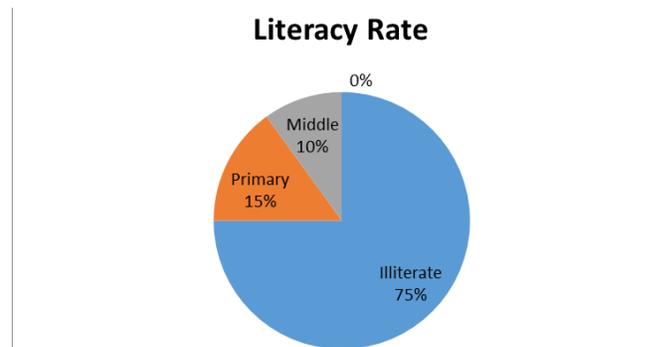


Figure 3-7: Literacy Rate

3.6.3 Common Diseases

According to the survey the common diseases recorded in the project area were, Diabetes, Fever, Hepatitis, Hypertension, stomach problems, Malaria, Typhoid, Nephritis and Diarrhea.

3.6.4 Livestock

People in the study area have common livestock which include; Cows, Buffalos, Sheep, Goats and Hens. However, there is no proper cattle or poultry farm observed within the study area.

3.7 LAB REPORTS OF ENVIRONMENTAL ANALYSIS

Testing of different parameters was done by HSE Services laboratory to check the quality of different environmental parameters. The copy of the lab reports of these parameters (ambient air analysis, water quality analysis and noise) is given in annexure.

3.8 SUITIBILITY OF SITE

Said project is the extension of M/S Nazim & Qasim (Pvt.) Limited. Selected site is surrounded by other industries and no other alternative site is considered for Said Project. The site is well located in regard to the following:

- Within vicinity of existing unit
- Plot near other industries
- Easy road access to the market
- No settlements in close vicinity
- No watercourse within a safe distance
- No ecologically sensitive or declared protected area within safe radius of the selected site

In view of these facts, it can be concluded that the Selected Site is best suited for the project, and will not pose any adverse impact or threat on any component of the environment.

Distance of selected site from different receptors is as follows:

| Sr. No | Receptors | Distance (Km) |
|---------------|--------------------|----------------------|
| 1 | Ugas LPG Plant | 0.71 |
| 4 | Bismillah Hospital | 0.50 |
| 5 | Govt. School | 1.73 |
| 6 | Burewala Road | 0.11 |
| 7 | Chak 164A/9L | 1.72 |

Considering the facts that said site is at a safe distance from sensitive receptors. The said site has advantage of not only to be environment friendly but also potentially sound to enhance sustainable development in the region. Therefore, given site is the most suitable for establishment of said project.

4 CHAPTER 4: STAKEHOLDER CONSULTATION

4.1 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 assess 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. Public consultation performa is attached as Annex-VIII of this EIA Report.

4.2 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 the all 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.

4.3 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:

4.3.1 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.

4.3.2 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

4.4 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.

4.5 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

4.5.1 Consultation Methodology

The methodology adopted for consultations is summarized below.

4.5.1.1 Consultation Material

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

4.5.1.2 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.

4.5.2 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.

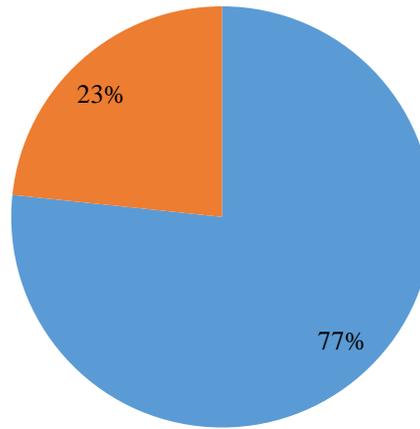
4.5.2.1 STAKEHOLDER CONCERNS AND RECOMMENDATIONS

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.

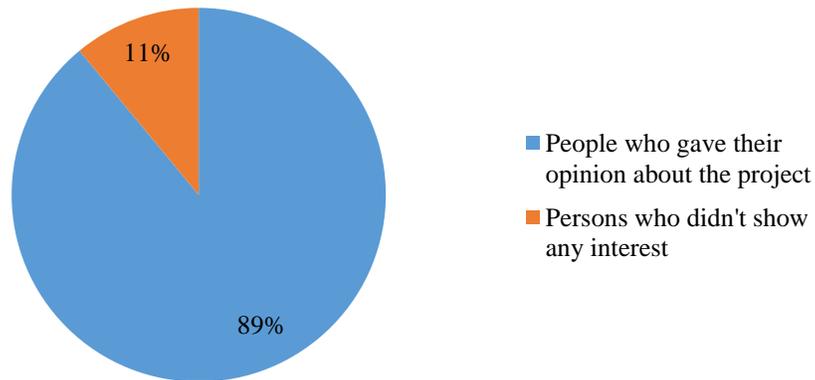
Awareness regarding project

■ people aware of project ■ people unaware of project

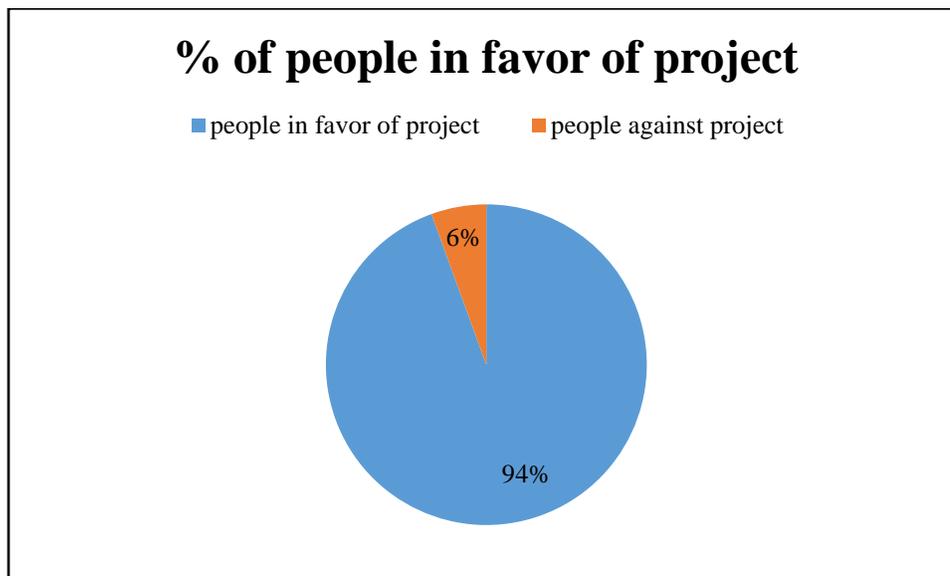


89% commented their views about the project and 11% didn't respond.

% of people who showed perspective



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 emissions, noise, wastewater and health impacts. Majority of the concerns were changed in the favor of installation after communicating the participants proper solutions and mitigation measures

4.6 STAKEHOLDERS CONSULTED

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

Table 4-1: 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 |

4.6.1 Secondary Stakeholders Consultation

The consultations were carried out with the local government officials and officials of the following departments:

1. District Office Environment, Kasur
2. Livestock Department

Comments and recommendations of all government representatives are presented in table below:

| S# | Participant | Designation | Concerns/Remarks |
|------------------------------|-------------|-------------|------------------|
| Responsible Authority | | | |

| | | | |
|--|---------------------------------------|---------------------------------------|--|
| 1 | Mr. | Inspector Environment | <ul style="list-style-type: none"> • EHS plan should be enforced strictly • Proponent should install proper wastewater treatment plant • Should 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 | | | |
| Livestock Department | | | |
| 1 | Dr. Muhammad Sohail Khan | Assistant Director Livestock | <ul style="list-style-type: none"> • He said that as per market response the standard and quality of the asphalt manufactured should be satisfactory • Said plant will provide jobs to local communities • Project will lead to community development • Will raise living standard • He also expressed that local people should be first preference for jobs and CSR works. |
| Proponent Environment Management Team | | | |
| 1 | Proponent Environment Management Team | Proponent Environment Management Team | <ul style="list-style-type: none"> • Local employment will be ensured • Tree plantation will be done to make project environment friendly • Wastewater treatment plant has been installed • No waste will be dumped improperly |
| Environmental Practitioners and Experts | | | |
| 1 | Dr. Muhammad Faqir Irfan | PhD. Environment Lawyer | <ul style="list-style-type: none"> • To avoid violation of section 11 Wastewater Treatment Plant should be installed |
| Affected and Wider Community | | | |
| 1 | Mr. Khurram | NGO (Parho Barho Punjab) | <ul style="list-style-type: none"> • Local employment should be ensured • Proponent shall work for betterment of community |

5 CHAPTER 5: POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

5.1 GENERAL

This chapter describes the potential environmental and social impacts of the proposed activities, predicts the magnitude of the impact and assesses the significance. The main intention of this section is to provide the mitigation measures that need to be adopted wherever necessary, to reduce, minimize, or compensate for the negative impacts.

5.2 IDENTIFICATION OF POTENTIAL IMPACTS

In the first step, potential impacts of the project are identified by desktop screening exercise, using checklists during field visits for collection of baseline data, professional judgment, published literature on environmental impacts of similar projects and standard environmental guidelines. Potential impacts are also identified through discussion with project proponent, consultation with stakeholder and community to identify their concerns. The main aspects associated with potential impacts are as follows:

- Water resources
- Ambient Air Quality
- Waste discharges
- Noise pollution
- Ecology of the area, including flora and fauna
- Vehicle movement
- Socio-economic conditions
- Archaeology

5.3 CLASSIFICATION OF IMPACTS

According to the type of potential receptors, the potential impacts are classified. The following receptor categories were used.

| Category of Receptor | Description |
|-----------------------------|--------------------|
|-----------------------------|--------------------|

| | |
|-----------------|---|
| Community | People their social and cultural values, aspirations and archaeological sensitivity |
| Land and Soil | Land resources, soil resources |
| Air Quality | Ambient air quality |
| Water Resources | Ground and surface water resources |
| Ecosystem | Vegetation, wildlife and biodiversity |

5.4 SCOPING CRITERIA FOR IMPACTS

The identified potential impacts of the project are evaluated on the basis of following criteria;

- The present baseline condition, the change in environmental parameters likely to be affected by the project related activities;
- Is there any impact that environmental standards or environmental guidelines applicable to the project will be breached?
- Is there a high risk of permanent, irreversible, and significant change to environmental condition due to particular project activity?
- Did the community express any concern about this aspect?

5.5 METHODOLOGY FOR IMPACT ASSESSMENT

5.5.1 What is the problem?

The project is about asphalt manufacturing industry, namely “Nazim & Qasim (Pvt.) Limited.”. The major impact associated with the construction and operation of the said industry includes solid waste management, wastewater management, noise emissions, tree plantation and fire-fighting arrangements.

5.5.2 When problem will occur and when it should be addressed?

The impacts from the said unit mainly occur during the construction and operational phase of the project. These issues include; noise generation, fugitive dust emissions, solid waste management, wastewater disposal, top-soil removal, Health and Safety issues and change in the geographic features of the area. These all problems should be addressed on-site where they are being generated, to avoid the residual or adverse impacts.

5.5.3 Where problem should be addressed?

The problem will be generated from site development and operation of the industry. So, it should be addressed on source, i.e. at site within the same timeframe.

5.5.4 How the problem should be addressed?

Proper mitigation measures will be provided according to the nature of the impacts/problems.

5.5.5 Ways of Achieving Mitigation Measures:

Following ways will be adopted to reduce the impacts of the proposed development:

5.5.5.1 Changing in Planning Design

The design of said unit is developed considering environmental risk and hazards. Moreover, there is no endangered and threatened species present in the project area. Any human settlement or infrastructure was not dislocated or dismantled due to the project development. Hence, there is no need to change the design of the project.

5.5.5.2 Improved Management and Monitoring Practices

The anticipated impacts will be reduced significantly by adopting better management activities, as it will be carried out for the betterment of the society. While environmental monitoring will be conducted on the regular basis to keep the sources of the air pollution, wastewater generation, noise and public nuisances in-check. Following practices that need to be adopted to reduce the impact significantly:

5.5.5.3 Compensation in Money Terms

Due to the development of the project, no tree cutting is involved, however, there is no protected or environmentally sensitive area present within 5.0 km vicinity of the project that could be impacted. Hence, no compensation in the monetary terms is required.

5.5.5.4 Replacement/Relocation/Rehabilitation

The project site is owned by the proponent and reserved for the said unit. No replacement, relocation and rehabilitation is required for the commencement of the aforesaid project.

5.6 IMPACT ASSESSMENT

Evaluation of impacts signifies the potential impacts in terms of its likelihood nature as per the following criteria:

- The impacts are further classified based on their spatial distribution, i.e. *local*, when impacting an area of approximately 1 km radius from the project area, *moderate spread*, when impacting an area of 1 to 2 km radius and *regional* beyond 2 km.

- The impacts are classified as *short term*, *moderate term* and *long term* in terms of their existence in temporal scale. Impacts less than 1 year existence as *short term*, while those with 1 to 3 years as *moderate term* and more than 3 years as *long term*.
- The negative impacts are termed as *adverse impacts* while positive impacts as *beneficial*.

The significance of environmental impacts of various involved activities has been evaluated based on the criteria outlined in Table 9.

Table 5-1: Impact Significance Criteria

| Impact | Criteria |
|---------------|---|
| Long term | When the impact is of high intensity with high spread and high duration |
| Moderate term | When the impact is of moderate intensity with high-moderate spread and high-moderate duration |
| Short term | When the impact is of low intensity but with moderate spread and moderate duration or of |
| Insignificant | When the impact is of low intensity, low spread and low duration |
| Beneficial | When the impacts are positive |

Based on the above-specified criteria, Matrix method has been used to describe potential environmental impacts due to project as shown in Table below. It is important to note that one activity may have varying impacts on different receptors i.e. different components of the environment. To avoid repetitions, this section describes various activities, which may have wide impacts on many receptors.

For example, waste generation and disposal will have impacts on land, water bodies, odour nuisance etc, therefore, the impacts of waste generation and disposal have been considered as one of the key areas of impacts. Similarly, gaseous emissions may be adverse to air quality; which on exposure may

impact upon health of individuals and ecology in the surroundings.

Table 5-2: Impact Screening Checklist (Construction Phase)

| Environmental Sensitivity | Nature of Likely Impacts | | | | | | Impact Significance | | | | |
|---------------------------|--------------------------|--------------------|----------------|-------|-----------------|----------|---------------------|---------------|------------|----------|-----------|
| | Low Intensity | Moderate Intensity | High Intensity | Local | Moderate Spread | Regional | Beneficial | insignificant | Short Term | Moderate | Long Term |
| Air Quality | | ✓ | | ✓ | | | | | Yellow | | |
| Noise | ✓ | | | ✓ | | | | Grey | | | |
| Water Quality | | ✓ | | | ✓ | | | | | Orange | |
| Land Environment | | | ✓ | | ✓ | | | | | | Red |
| Flora | | ✓ | | ✓ | | | | | Yellow | | |
| Fauna | ✓ | | | ✓ | | | | Grey | | | |
| Local Economy | | | ✓ | | ✓ | | Green | | | | |
| Social Impacts | | | ✓ | ✓ | | | Green | | | | |
| Health & Safety | | ✓ | | ✓ | | | | | Yellow | | |

Table 5-3: Impact Screening Checklist (Operational Phase)

| Environmental Sensitivity | Nature of Likely Impacts | | | | | | Impact Significance | | | | |
|---------------------------|--------------------------|--------------------|----------------|-------|-----------------|----------|---------------------|---------------|------------|----------|-----------|
| | Low Intensity | Moderate Intensity | High Intensity | Local | Moderate Spread | Regional | Beneficial | insignificant | Short Term | Moderate | Long Term |
| Air Quality | | ✓ | | | ✓ | | | | | Blue | |
| Noise | | ✓ | | ✓ | | | | | Yellow | | |
| Water Quality | | | ✓ | | ✓ | | | | | Blue | |
| Land Environment | ✓ | | | | | | | Grey | | | |
| Flora | ✓ | | | ✓ | | | | Grey | | | |
| Fauna | ✓ | | | ✓ | | | | Grey | | | |
| Local Economy | | | ✓ | | ✓ | | Green | Green | | | |
| Social Impacts | | | ✓ | ✓ | | | Green | Green | | | |

| | | | | | | | | | | |
|-----------------|--|---|--|---|--|--|--|--|--|--|
| Health & Safety | | ✓ | | ✓ | | | | | | |
|-----------------|--|---|--|---|--|--|--|--|--|--|

5.7 IMPACTS DUE TO PROJECT LOCATION

The said project site is located in area surrounded by other industries. The project site is devoid of any forest; hence the site clearance from Forest Department is not involved. Further, the project site is devoid of any human habitation hence evacuation of the project-affected persons is not involved in this project. Thus, no resettlement and rehabilitation issues are involved in the said project. This project will be developed while undertaking minimum cutting for making terraces for construction while making minimum modifications in the terrain conditions and implementing environmental measures.

The topsoil removed from the site will be restored in dumps during construction period and in the post construction phase. The top soil will be spread on the unbuilt area of the plot and tree plantations and green belt development will be taken up. As the top soil removed from the site will be reused for the growth of plants, no adverse impact will be envisaged due to removal of topsoil from the site.

5.8 DESIGN PHASE

In general, the design of the said project optimized the use of best available technology in order to prevent or minimize potentially significant environmental impacts associated with the project as well as to ensure high level business and environmental performances. In pre-construction / design phase, a management system will be provided at design level for the reduction of impacts. Design of the said project will be adhered to all standard technical requirements in order to avoid adverse impacts on the environment and human health. Efficient infrastructure will be developed. Procurement of construction materials from approved dealers will be ensured.

5.9 IMPACTS ASSOCIATED WITH CONSTRUCTION PHASE

This section explains how said project affected different environmental aspects and its mitigation measures to manage the impact. The

impacts during construction phase will be temporary and localized. Even though, the proper mitigation measures will be followed to minimize such impacts.

| Sr. No | Aspect | Impacts | Mitigation Measures |
|---------------|---------------------|---|---|
| 1 | Economy Improvement | During construction phase, employment opportunities for local people will be generated. | No mitigation measure are required. |
| 2 | Air Quality | During construction phase, suspended particulate matter will be the main pollutants Fugitive emissions will be observed due to vehicular movement. But it will be negligible or temporary phenomenon. | Dust emissions will be minimized through strict enforcement of onsite speed controls. The routes will be sprinkled with water regularly to reduce the amount of dust generated by construction vehicles. All vehicles and construction machinery will be properly tuned, serviced and monitored on regular basis. |
| 3 | Water Quality | During construction phase, water will be required for sprinkling on roads for dust suppression, domestic uses of construction workers | During this phase, water conservation practices will be given proper consideration. |

| | | | |
|---|-------------------------|---|--|
| 4 | Relocation of Utilities | The project site is already near other industries. The construction will not relocate the existing public utilities. | No mitigation measure will be required. |
| 5 | Solid Waste Generation | During excavation of the site for foundation works and landscaping, solid waste will be generated. The waste consisted of metal cuttings, rejected materials, surplus material, paper bags, cement bags, empty cartons and broken glass pieces. | Recyclable material will be separated at source. The cement bags and other such items will be handed over to approved contractors on weekly basis. |
| 6 | Noise Pollution | During construction phase, the major sources of noise are due to operation of construction equipment. The anticipated noise will be mostly confined to the facility itself. | Several mitigation measures will be considered. For this purpose, most of the extension works will be done in day time. |
| 7 | Ecology | The project site is located in industrial zone. It is devoid of thick forest and vegetation. | Tree plantation will be done to act as pollution barrier as well as to enhance the aesthetic beauty of the area. |

| | | | |
|---|---|---|---|
| 8 | Worker's Health, Safety and Environment | The construction activities have the potential to pose negative impact on the health and safety of workers in case of unfavorable working conditions. | <p>The contractor will ensure that the workers and labors will be trained in safety procedures for all relevant aspects of the construction. Workers will be provided with proper safety equipment which will be required on the basis of nature of the work.</p> <p>First aid kits will be kept available on the site to ensure safe working environment for the labors and workers.</p> <p>As per the requirement warning signs will be displayed in local language. Proper fencing will be done around the site.</p> |
|---|---|---|---|

5.10 IMPACTS ASSOCIATED WITH OPERATION PHASE

In this section, the environmental and socio-economic impacts associated with the said project operation activities are discussed. The impacts that are discussed are as follows:

1. Environmental Impacts

- Air emissions
- Noise
- Traffic
- Solid waste and by-products
- Wastewater

- Resource Consumption
 - Abnormal conditions
 - Occupational Health and Safety
- 2. Socioeconomic Impacts**
- Employment Opportunity
 - Community Development

5.11 ENVIRONMENTAL IMPACTS

5.11.1 AIR EMISSIONS

POTENTIAL IMPACTS

Air emissions from the project are relatively small. Particulate emissions are typically not significant. Fugitive dusts and emissions may result during raw material handling and storage which is relatively less 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:

- Clean and maintain a sufficient level of temperature and humidity in every section.
- Proper handling of raw material to minimize the likelihood of fugitive dust and emissions during storage.
- Monitoring of Ambient air parameters (Particulate matter, SO_x, NO_x) 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.

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.

5.11.2 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 said 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. The residential area is located at a distance of more than 1.5 km away from the project site and there will be no significant impact on the community.

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 said unit noise on the surrounding environment.

5.11.3 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.

5.11.4 SOLID WASTE

Solid waste is mainly generated from aggregate dust, rejected or leftover asphalt mix, and packaging materials such as bitumen drums or bags. Most of this waste is recyclable—dust and fines are often reintroduced into the mix, Damaged or excess asphalt is commonly reused in new asphalt production. The generated domestic solid waste will be handled as per area practices. If the waste management is not carried out properly, it can affect health of workers, pollution of soil, surface or ground water. All waste generated from the project will be managed by proposed controls. The environmental impacts will be minimized after the implementation of the proposed mitigations.

MITIGATION MEASURES

The following mitigation measures will be implemented:

GENERAL WASTE MANAGEMENT PRACTICES

During operational phase of the project, a proper waste management plan will be devised and implemented. Key elements of the waste management system will include the following:

ON-SITE HANDLING

- Proper waste collection system will be ensured. For this purpose, waste bins will be placed inside the boundary.
- Records of generated waste should be maintained.
- Solid waste mainly includes Solid waste is mainly generated from aggregate dust, rejected or leftover asphalt mix, and packaging materials such as bitumen drums or bags. Most of this waste is recyclable—dust and fines are often reintroduced into the mix, Damaged or excess asphalt is commonly reused in new asphalt production.

OTHER MANAGEMENT MEASURES

- Training will be provided to personnel for identification, segregation and management of waste.
- All containers of waste will be labeled properly.
- In-house audits of the waste management will be undertaken on regular basis.

RESIDUAL IMPACTS

Proper implementation of the mitigation measures will minimize the residual impact from waste. Monitoring and inspection will be undertaken to ensure the implementation of mitigation measures.

5.11.5 WASTEWATER

wastewater is mainly generated from equipment washing, aggregate dust

suppression, and cooling processes.. It will be disposed off after Treatment effluent treatment plant. Municipal wastewater coming from various municipal works, such as cleaning will be generated, which will be as per area practice.

RESIDUAL IMPACTS

Implementation of the proposed mitigation measures and regular monitoring is not likely to leave any significant impact of the waste water from the said unit.

5.11.6 ABNORMAL CONDITIONS

Abnormal events might include loss of power and fire outbreak. The said unit will have its own backup power supply using diesel generator to protect against a loss of power. The facility will be equipped with a proper fire-fighting and emergency evacuation plan to tackle in case of any fire outbreak.

5.11.7 OCCUPATIONAL HEALTH AND SAFETY

This section discusses the occupational health and safety impacts of the operation of said unit. Physical hazards may include exposure to same-level fall hazards due to slippery conditions especially during cleaning of syrup tanks. 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.

5.12 SOCIOECONOMIC IMPACTS

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

Table 5-4: 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.

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 80-100 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.

5.13 POTENTIAL ENVIRONMENTAL ENHANCEMENT MEASURES

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.

6 CHAPTER 6: ENVIRONMENTAL MANGEMENT AND MONITORING PLANS

6.1 GENERAL

This EIA provides the Environmental Management Plan (EMP) of the project to keep it environment benign as well as the monitoring plan to ensure the compliance of the established EMP.

Outline and key features of the EMP for construction and operations phase is presented in sub-sections below. As per the environmental legislation in Pakistan, the EMP for the operations phase, along with other documents, is to be submitted 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 require regular monitoring. This section also underlies the monitoring framework for both construction and operation phases to check compliance of the EMP and to take timely actions for correction in case any accident of significant criteria, requirements or goals are found.

6.2 OBJECTIVES OF ENVIRONMENTAL MANAGEMENT PLAN

The primary objectives of the EMP are to:

- Facilitate the implementation of the mitigation measures identified
- Define the responsibilities of the project proponent and contractor and provide a means of effective communication of environmental issues between them.
- Identify monitoring parameters in order to ensure the effectiveness of the mitigation measures
- Provide a mechanism for taking timely action in the face of unanticipated environmental situations.
- Identify training requirements at various levels.

6.3 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.

6.4 COMPONENTS OF THE EMP

THE EMP CONSISTS OF THE FOLLOWING:

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

6.5 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.

Table 6-1: Environmental Management Plan/Proposed Mitigation Actions

| 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 | <ul style="list-style-type: none"> • 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- | Contractor/Compliance Department | On commencement of construction activities | Safety of workers will be ensured by implementing proposed mitigation measures |

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| | <p>plugs/muffs, safety boots, etc. and its use will be strictly enforced</p> <ul style="list-style-type: none"> Workers will be trained on the regular basis regarding personal safety Incidents will be reported directly to the concerned authority | | | |
| Construction waste management | | | | |
| <p>To prevent the contamination of soils and water resources due to inappropriate management and disposal of waste</p> | <ul style="list-style-type: none"> The construction site has 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 | <p>Contractor</p> | <p>Throughout construction stage</p> | <p>Waste will be disposed of/reused/ recycle or resale as per practices of area</p> |

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| | <ul style="list-style-type: none"> Scrap and the debris will be removed from the site at the end of the construction stage after appropriate segregation of the material | | | |
| Pollution control management | | | | |
| To contain spillages | <ul style="list-style-type: none"> 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. Appropriate procedures and protocols will be established and monitored for materials transport and handling whilst on the site. | Contractor | On-site establishment | Potential for accidental release of materials during transport and handling on the site will be minimized. |
| To manage sewage | Existing toilets will be used | Contractor | On commencement of construction | |
| Protection of biodiversity | | | | |
| To avoid unnecessary disturbance of and quick recovery of biodiversity in the plant site | <ul style="list-style-type: none"> Avoid destruction of biodiversity outside the designated factory construction site Minimize clearing of vegetation during construction | Contractor | Throughout construction phase | Vegetation loss cannot be avoided, but successful restoration, improvement and long-term management of the surrounding areas and maintenance of |

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| | <ul style="list-style-type: none"> • 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 | | | <p>planted trees will be provided</p> |
| Air quality & dust management | | | | |
| <p>To minimize the dust entrainment during construction</p> | <ul style="list-style-type: none"> • 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 • No excavation activity will be carried out during windy days • Fuel-efficient and well-maintained haulage trucks will be employed to minimize exhaust emissions | <p>Contractor</p> | <p>On commencement of construction activities</p> | <p>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.</p> |

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| | <ul style="list-style-type: none"> Construction workers will be sensitized on measures to reduce air pollution | | | |
| Noise | | | | |
| To minimize disturbance due to noise | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> Management will ensure that fire extinguishers are located in strategic and visible places All vehicles and construction equipment will be under control of competent personnel Inspection of material and harmonization to the occupational health and safety standards. | Contractor | Throughout construction phase | Record of all incidents will be maintained and reported to EHS manager. |

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| | <ul style="list-style-type: none"> Adequate security for workers will be provided during construction Sensitize workers to operate in teams | | | |
| Operation phase | | | | |
| Wastewater management | | | | |
| Degradation of surface waters quality due to process water and sewage direct disposal | wastewater is mainly generated from equipment washing, aggregate dust suppression, and cooling processes.. It will be disposed off after Treatment effluent treatment plant. Municipal wastewater generator from domestic use and cleaning is disposed off as per area practices. | Nazim & Qasim (Pvt.) Limited. | Throughout project life cycle | None |
| Air quality management | | | | |
| Particulate emissions and generator stack emissions | <ul style="list-style-type: none"> No air emission is likely to be released during operation of the project; except the dust or PM to be produced during floor cleaning and other such operations, which also will not be posing any environmental threat (will not breach the safe | Nazim & Qasim (Pvt.) Limited. | Throughout operation phase | Local air quality will be virtually unaffected and will be based on PEQs |

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| | <p>standards). Wet suppression is done to control dust emissions. Generator emissions will be controlled by providing proper enclosure, tuning and maintenance.</p> | | | |
| Noise & vibration | | | | |
| <p>To minimize disturbance of communities due to noise</p> | <ul style="list-style-type: none"> • All the machinery will be installed and operated in a closed hall and from operation of machinery noise will not be a problem for the residents in the area nearby. Further Administration of the unit will take the precautionary measures to avoid the noise emissions. There is no possibility of Noise pollution • A thick greenbelt will be developed all around the plant which will be acting as noise barrier. • 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 | <p>Nazim & Qasim (Pvt.) Limited.</p> | <p>Throughout project life cycle</p> | <p>Noise level will be based on PEQs</p> |

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| | maintenance of their vehicles. | | | |
| Traffic & transport | | | | |
| Increased heavy vehicles traffic both locally and nationally. | <ul style="list-style-type: none"> 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 Nazim & Qasim (Pvt.) Limited. | 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 | <ul style="list-style-type: none"> 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 Incidents should be reported directly to the concerned authority | Compliance Department | Throughout life cycle of project | Potential of injuries will be minimized |
| First aid | | | | |
| To ensure safety | <ul style="list-style-type: none"> First aid box will be available | Compliance | Throughout life | None |

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|-------------------------|---|-----------------------|----------------------------------|---|
| and health | at the site <ul style="list-style-type: none"> • 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 | Department | cycle of project | |
| Fire hazard | | | | |
| To prevent any disaster | <ul style="list-style-type: none"> • 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. List of fire posts is annexed. • 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 | Compliance Department | Throughout life cycle of project | Potential of disaster will be minimized by suggested mitigation measures implementation |

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| | basis <ul style="list-style-type: none"> • Emergency evacuation plan is annexed. | | | |
| Employment | | | | |
| To provide job opportunities and helping in improving living standard of people | <ul style="list-style-type: none"> • 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. | Nazim & Qasim (Pvt.) Limited. | During construction and operation phase | Direct and indirect jobs |

6.6 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 6-2: Environmental Monitoring Plan

| Env. Component | 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 | Stack emissions | Air Quality Monitors/Gadgets | PEQs | stack | Monthly | 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 |
| Wastewater | Operation | BOD, COD, TSS etc | Through approved equipments | PEQs | ETP | Monthly | As per approved testing method | Through approved third party/monitoring lab |

6.7 ROLES & RESPONSIBILITIES OF ENVIRONMENT MANAGEMENT TEAM

The organizational structure for the Environment Management Plan is outlined below:

6.7.1 Primary Responsibilities

The primary responsibility for implementing EMP lies with the owner of project.

6.7.2 Operation Management & Control

Conducting the operational activities in environmentally sound manner will be the responsibility of the concerned Manager; for which he will be trained.

6.7.3 Supervision & Monitoring

Senior Supervisor will be responsible for all environmental issues and for the implementation of EMP.

6.8 REPORTING & REVIEWING PROCEDURES

An effective mechanism to store and communicate environmental information during the project is an essential requirement of an EMP.

6.8.1 MEETINGS

Two kinds of environmental meetings will take place during the project:

- Kick-off meetings
- Weekly meetings

The purpose of the kick-off meeting will be to present the EMP to project staff and discuss its implementation and to discuss any event of environmental significance that has happened in the under-discussion industry or a similar industrial unit to investigate its root causes and develop its solutions.

The purpose of the weekly meetings will be to discuss the conduct of the operation and environmental issues and their management. The proceedings of the meeting will be recorded in the form of a weekly

environmental report.

6.8.2 CHANGES-RECORD REGISTER

A change-record register will be maintained at the site, in order to document any changes in project design. These changes will be handled through the change management mechanism.

6.9 ENVIRONMENTAL TRAINING

Environmental training will help to ensure that the requirements of the EIA and EMP are clearly understood and followed by all project personnel in the course of the project.

Table 6-3: Training Program

| Target audience | Trainers | Contents | Schedule |
|----------------------------------|-------------|---|-------------------------|
| Selected management staff | Contractors | Key finding of mitigation measure | After every five months |
| All personnel | EHS Officer | Mitigation measures | Monthly |
| Technical Staff | EHS Officer | Waste disposal or sale out status, vehicle movement restriction and other mitigation measures | After every three month |
| Other staff | EHS Officer | Waste disposal, resource conservation and other mitigation workers | Monthly |

6.10 EQUIPMENT MAINTENANCE DETAILS

The project is about Asphalt Manufacturing Plant namely “Nazim & Qasim (Pvt.) Limited.”. Machines in said unit will be maintained on the regular basis. The fire-fighting equipment that would be installed in the halls/buildings will also be checked and maintained on regular basis. Only fire safety equipment such as; portable fire extinguishers will be installed which will need regular

maintenance and check in order to eliminate hazards of associated the fire risks. Following is the maintenance details for the machines and equipments:

| Task | Weekly | Monthly | Semi-Annually | Annually |
|-----------------------------------|---------------|----------------|----------------------|-----------------|
| Visual Inspection | ✓ | | | |
| Testing and Inspection | | | ✓ | |
| Maintenance of Machines | | ✓ | | |
| Fire Mains and Nozzles | | ✓ | | |
| Containers/Cylinders | | | ✓ | |
| Control and Section Valves | | | ✓ | |

6.11 ENVIRONMENTAL BUDGET

Approximately PKR 0.2 Million budget will be reserved for tree plantation, solid waste management, wastewater management and environmental monitoring. Monitoring tests for ambient air quality, noise and groundwater quality will also be conducted.

Table 6-4: Schedule for Implementation & Environmental budget

| Amenities | Frequency | Cost in PKR (Million) | |
|--------------------------|--|------------------------------|----------------|
| Ambient air monitoring | Construction: Biannually Operation: quarterly | 20,000/- | 0.2 Million |
| Noise monitoring | Construction: Biannually Operation: quarterly | 10,000/- | |
| Water quality monitoring | Construction: Biannually Operation: | 20,000/- | |

| | | | |
|---|-----------|----------|------------------------|
| | quarterly | | |
| Health & safety | Daily | 30,000/- | |
| Tree Plantation/Green Belts Development | Monthly | 60,000/- | |
| Solid Waste Management | Monthly | 60,000/- | |
| Total Cost | | | PKR 0.2 Million |

7 CHAPTER 7: CONCLUSION AND RECOMMENDATIONS

7.1 CONCLUSION

The report presents Environmental Impact Assessment (EIA) of the said Asphalt Manufacturing Plant .

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.

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. From the historical records and vast experience in sustainable development keeping environment as integral part of manufacturing system, Nazim & Qasim (Pvt.) Limited. is worthy of Environmental approval. Further the project is not likely to cause any significant adverse impact on the physical and biological environment but positive impact on social development and economic prosperity of the area, provided that suitable mitigation measures as identified in this study are implemented.

It is accordingly recommended that Environmental Approval for the project may be issued by the Punjab Environmental Protection Agency, subject to payment of the requisite scrutiny fee by the proponent of the project.

7.2 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 unit 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.