

# Midland Knitwear Limited

A Concern of Micro Fiber Group



## ENVIRONMENTAL IMPACT ASSESSMENT OF MIDLAND KNITWEAR LTD. (DRAFT COPY)

52/03, Block-E, Shantinagar, Shiddhirganj,  
Narayanganj City corporation, Narayanganj,  
Bangladesh

### ABSTRACT

Midland Knitwear Limited is a premier manufacturer of various types of Fabrics dyeing finishing, Knitting industry

Prepared By  
Global Environmental  
and Textile  
Technological  
Services

October -2024

## Declaration

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This Environmental Impact Assessment (EIA) report has been prepared for the proposed **Midland Knitwear Limited** by Global Environmental and Textile Technological Services (GETTS). It contains different impact and management plans for the project's environmental issues. It indicates the ecological effects due to the project's settlement and mitigation measurements.

GETTS is one of the renowned environmental consulting firms 2011 in the country, which has been providing services in the relevant fields for the last 15 years. We have experience in the field of design, drawing, installation, and consulting of numerous wastewater treatment plants (WWTP), effluent treatment plants (ETP), sewage treatment plants (STP), and any kind of environmental report like IEE, EIA, EMP, ZLD, etc. along with certification process from the DoE. We have more than 250 clients and 450 projects up to this.

The report was guided by Dr. Md. Mostafizur Rahman, PhD, Associate Professor, Department of Environmental Sciences Jahangirnagar University, and Executive of the said consultancy firm. Md. Shaik Hassan Ashik is the prime author of the said report. The entire GETTS team was assisted and coordinated to complete the EIA report successfully.

The project's Board of Directors has been assisted with various data and information, which we acknowledge.

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Midland Knitwear Limited

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## *Abstract*

Midland Knitwear Limited is a premier manufacturer of various types of Fabrics for the Dyeing, Finishing, and Knitting industries. We always ensure quick development with actual color matching, perfect color fastness, and earlier delivery of multiple goods with our logistics support.

The project authority respects customer demand, as their satisfaction is our pleasure. We maintain strong working relationships with our customers from the development stage to the finished product. Our best customer relationship policy is to deliver good quality products at reasonable prices and maintain commitment.

**M. Shamsuzzaman, Managing Director of Midland Knitwear Limited**, has proposed setting up this project. According to the ECR 2023, the project is categorized as **Green** per Schedule 1. The proponent of Midland Knitwear Limited has requested **Global Environmental & Textile Technological Services (GETTS)** to prepare an EIA report on this project per the DoE guideline. Accordingly, this EIA report has been prepared.

## **Mission**

- “To be one of the Top Global Players in the specialized Fabrics Dyeing Finishing and Knitting sector, bringing inspiration and innovation to products we create.”
- To innovate, lead, enhance, and provide best-value Fabrics, Dyeing, Finishing, and Knitting and services to global customers.
- To make a difference through our variation of products to stay ahead of fashion trends, market changes, and the latest technology.
- Being innovative, cost-effective, and globally competitive
- Ensuring in-time delivery with the right quality
- Committing to a cleaner and greener environment.

## **Vision**

- Become the most preferred fabric dyeing, Finishing, and Knitting manufacturer for global clothing companies with the philosophy of corporate sustainability.

শেখ হাসিনার বাংলাদেশ  
পরিচ্ছন্ন পরিবেশ

Government of the People's Republic of Bangladesh  
Department of Environment  
Head Office, Paribesh Bhaban  
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www.doe.gov.bd



Memo No: 22.02.6700.140.72.028.23. | ২৬

Date: October 18, 2023

**Subject: Approval of Terms of Reference for EIA of Midland Knitwear Limited, Ramarbagh, Kutubpur, Fatullah, Narayanganj.**

Ref: Your Application on 19.07.2023

With the subject mentioned above, the Department of Environment hereby gives approval of Terms of Reference for EIA of **Midland Knitwear Limited**, Ramarbagh, Kutubpur, Fatullah, Narayanganj subject to fulfilling the following terms and conditions:

- I. The project authority shall submit a comprehensive Environmental Impact Assessment (EIA) considering the overall activity of the said project in accordance with the ToR submitted to the Department of Environment (DoE).
- II. The EIA report shall be prepared in accordance with the guidelines provided in the schedule-11 and Rules-15, 16 of the Environmental Conservation Rules, 2023.
- III. Hence the Department of Environment issues additional ToR to include in the EIA as follows:
  1. **Environmental and Social Baseline information should include:**
    - Project site specific micro-meteorological data including temperature, humidity, wind speed & direction and rainfall;
    - Surface water quality of nearby river (100 meter upstream and downstream of the discharge point) and other surface drains at 8 location;
    - Noise level monitoring at 8 (eight) locations within the study area.
    - Detailed description of flora and fauna existing in the study area with special reference to rare, endemic and endangered species.
    - Socio-economic status of study area.
  2. **Anticipated Environmental and Social Impacts due to the project shall be identified and assessed for their magnitude:**
    - Water Quality (Surface & ground water)
    - Hazardous waste
    - Noise
    - Offensive Odor
    - Flora and fauna
    - Livelihoods, community health and safety, vulnerable group and gender issues
  3. **Environmental Mitigation, Management and Monitoring Plan shall include:**
    - Treatment of waste water from different plant operation, recycled and reused of waste water for different purposes shall be included. In the EIA report, information regarding ETP and STP should be included following schedule 12 of the Environmental Conservation Rules, 2023.
  4. **Occupational Health and Safety Plan should include:**
    - Details of exposure to specific occupational health and safety hazard;
    - Plan and fund allocation to ensure the occupational health and safety of all workers;
    - Annual report of health status of workers with special reference to OHS.

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- IV. The project proponent should conduct public consultation following the procedures mentioned in the Rule 16 of the Environmental Conservation Rules, 2023.
- V. The project authority shall submit the EIA report to the Head Office of DoE in Dhaka.
- VI. Without approval of EIA report by the Department of Environment, the project authority shall not undertake land and infrastructural development.
- VII. Without obtaining Environmental Clearance, the project authority shall not start the trial production of the project.

  
(Masud Iqbal Md. Shameem)  
Director (Environment Clearance)  
Phone: 88-02-8181673

**Managing Director**  
Midland Knitwear Limited  
Ramarbagh, Kutubpur  
Fatullah, Narayanganj

**Copy Forwarded to:**

1. Director, Department of Environment, Dhaka Regional Office, Dhaka.
2. Deputy Director, Department of Environment, Narayanganj District Office, Narayanganj.
3. Assistant Director, Office of the Director General, Department of Environment, Head Office, Dhaka.

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## ABBREVIATION

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IEE	Initial Environmental Examination
ECC	Environmental Clearance Certificate
NEQS	National Environmental Quality Standards
BOD	Biochemical Oxygen Demand
CDM	Clean Development Mechanism
COD	Chemical Oxygen Demand
CP	Cleaner Production
DO	Dissolved Oxygen
DoE	Department of Environment
EC	Electrical Conductivity
ECR	Environmental Conservation Rules
EMP	Environmental Management Plan / Environmental Monitoring Plan
EMS	Environmental Management System
SAARC	South Asian Association of Regional Cooperation
EIA	Environmental Impact Assessment
EQ	Equalization
ETP	Effluent Treatment Plant
GETTS	Global Environmental and Textile Technological Services
GoB	Government of Bangladesh
UNCED	United Nation Conference on the Environment and Development
AQI	Air Quality Index
KW	Kilowatt
HSE	Health & Safety Executive
OSHA	Occupational Safety and Health Administration
MoA	Ministry of Agriculture
MoEF	Ministry of Environment and Forest
NEMAP	National Environmental Management Action Plan
NGO	Non-Government Organization
MSDS	Material Safety Data Sheet
PPE	Personal Protective Equipment
p <sup>H</sup>	Potential of Hydrogen
ppm	Parts Per Million
PVC	Polyvinyl Chloride
PRSP	Poverty Reduction Strategy Paper
OWS	Oil Water Separator

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## GLOSSARY

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- **Adverse impact:** An impact that is considered undesirable.
- **Ambient air:** Surrounding air.
- **Aquatic:** Growing or living in or near water.
- **Bangla:** Bengali language.
- **Baseline (or existing) conditions:** The „baseline“ essentially comprises the factual understanding and interpretation of existing environmental, social and health conditions of where the business activity is proposed. Understanding the baseline shall also include those trends present within it, and especially how changes could occur regardless of the presence of the project, i.e., the „No-development Option“.
- **Bazar:** Market.
- **Bigha:** 20 Katha
- **Beel:** A „back swamp“ or depression. It can be either perennial or seasonal.
- **Beneficial impacts:** Impacts, which are considered to be desirable and useful.
- **Biological diversity is the variety of life forms, the different plants, animals, and microorganisms, the genes they contain, and the ecosystems they form. It is usually considered at three levels: genetic diversity, species diversity, and ecological diversity.**
- **Ecosystem:** A dynamic complex of plant, animal, fungal and microorganism communities and associated non-living environments interacting as an ecological unit.
- **Emission:** The total amount of solid, liquid or gaseous pollutant emitted into the atmosphere from a given source within a given time, as indicated, e.g., in grams per cubic meter of gas or by a relative measure, upon discharge from the source.
- **Endangered species:** Species in danger of extinction and whose survival is unlikely if the existing conditions continue to operate. Among those are species whose numbers have been reduced to a critical level or whose habitats have been so drastically reduced that they are deemed to suffer from immediate danger of extinction.
- **Environmental effects are the measurable changes in the natural system of productivity and environmental quality** resulting from a development activity.
- **Environmental impact assessment (EIA) / Environmental assessment:** The systematic, reproducible and interdisciplinary identification, prediction and evaluation, mitigation and management of impacts from a proposed development and its reasonable alternatives, sometimes known as environmental assessment.
- **Environmental Impact:** An estimate or judgment of the significance and value of environmental effects for natural, socio-economic and human receptors. Environment Management Plan (EMP): A Plan to undertake an array of follow-up activities which provide for the sound environmental management of a project/ intervention so that adverse environmental impacts are minimized and mitigated; beneficial environmental effects are maximized; and sustainable development is ensured.
- **Environmental Management:** Managing the productive use of natural resources without reducing their productivity and quality.

- **Erosion:** Process in which wind and water removes materials from their original place; for instance, soil washed away from an agricultural field.
- **Evaluation:** The process of looking back at what has been really done or accomplished.
- **Fauna:** A collective term denoting the animals occurring in a particular region or period.
- **Field Reconnaissance:** A field activity that confirms the information gathered through secondary sources. This field study is essentially a rapid appraisal.
- **Flora:** All of the plants found in a given area.
- **Green Building:** The project of increasing the efficiency with which buildings and their sites use energy, water, and materials and reducing building impacts on human health and the environment over the entire life cycle of the building.
- **Habitat:** The natural home or environment for a plant or animal.
- **Household:** A household is identified as a dwelling unit where one or more persons live and eat together with joint cooking arrangement. Persons living in the same dwelling unit having separate cooking arrangements constitute separate household.
- **Important Environmental Component (IEC):** These are environmental components of biophysical or socio-economic importance to one or more interested parties. The use of important environmental components helps to focus the environmental assessment.
- **Initial Environmental Assessment / Evaluation:** A preliminary analysis undertaken to ascertain whether there are sufficient likely significant adverse impacts to warrant a „full“ EIA. In some countries, the use of initial assessments forms a means of “screening” proposed projects.
- **Mauza:** A Bangla word for the smallest government administrative area corresponding to village revenue unit.
- **Mitigation:** An action, which may prevent or minimize adverse impacts and enhance beneficial impacts.
- **Negative Impact:** Negative change from the existing situation due to the project.
- **Public involvement / Public consultation:** A range of techniques that can be used to inform, consult or interact with stakeholders“ affected / to be affected by a proposal.
- **Reversible impact:** An environmental impact that recovers either through natural process or with human assistance (e.g. cutting off fish migration by an embankment might be reversible at a later stage if a proper regulator is built).
- **Stakeholders:** Those who may be potentially affected by a proposal, e.g., Local people, the proponent, government agencies, NGOs, donors and others, all parties who may be affected by the project or to take an interest in it.
- **Taka:** Unit of Bangladeshi currency.
- **Terrestrial:** Living on land.
- **Thana:** Sub-district level of government administration, comprising several unions under district.
- **Union:** Smallest unit of local self-government comprising several villages.
- **Upazila:** Sub-district name. Upazila introduced in 1982.
- **Zila:** Bengali word of district.

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**CHAPTER 1 EXECUTIVE SUMMARY**

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MIDLAND KNITWEAR LIMITED is to be incorporated in Bangladesh as a limited company with a vision to establish as one of the most progressive and diversified Fabrics Dyeing Finishing and Knitting such as Drawstring, Drawstring Tipping, Narrow Fabric, Doubling and Twisting Yarn, Woven Label, Printed Label, Screen Printed label, Sewing Thread, Poly Bag, Gum tape, Elastic, Embroidery and Price Ticket provider companies in the sub-continent. With a long-term focus on developing and establishing a sustainable business footprint, MIDLAND KNITWEAR LIMITED will strive towards heavy technologically advanced services aimed at numerous customers in Bangladesh and beyond. The company aspires to engage in a long-term and sustainable business vision led by a talented team of leaders and professionals in the sector. With a continuous focus on quality improvement and value addition, adoption of top-of-the-line technology, commitment towards maintaining a safe and healthy workplace for the workers, and strict adherence to buyer requirements, this company will become one of the most preferred RMG service providers in the future.

The **MIDLAND KNITWEAR LIMITED** intends to build a Knit, Dyeing, Finishing, and fabric production factory at **52/03, Block—E, Shantinagar, Shidhirganj, Narayanganj City Corporation, Narayanganj**. Geographically, the project is located between **23°46'22.2"N latitude and 90°33'31.5"E longitudes**. The total land area of the project is 1, 26, 800 sq feet. The factory is operated in two buildings with four floors.

**Engineer M. Shamsuzzaman , Managing Director** of Micro Fiber Group and **Midland Knitwear Limited, is a sister concern of the microfiber group**. The authority set up this project. According to the ECR 2023, the project is categorized as **RED** per Schedule 1. The authority already got the approval for TOR from the Department of Environment as per memo NO. 22.02.6700.140.72.028.23.123, Date- October 18, 2023. Midland Knitwear Limited's proponent has requested Global Environmental & Textile Technological Services (GETTS) to prepare an EIA report on this project under Dr. Mustafizur Rahman's (PhD) supervision, per the DoE guideline. Accordingly, this EIA report has been prepared.

**Midland Knitwear Limited** already got an ECR from the DoE. The project will be very close to 52/03, Block—E, Shantinagar, Shidhirganj, Narayanganj City Corporation, Narayanganj. The project area has various communication facilities and is accessible through the Dhaka—Sylhet Highway.

Master plan For Midland Knitwear Ltd-2

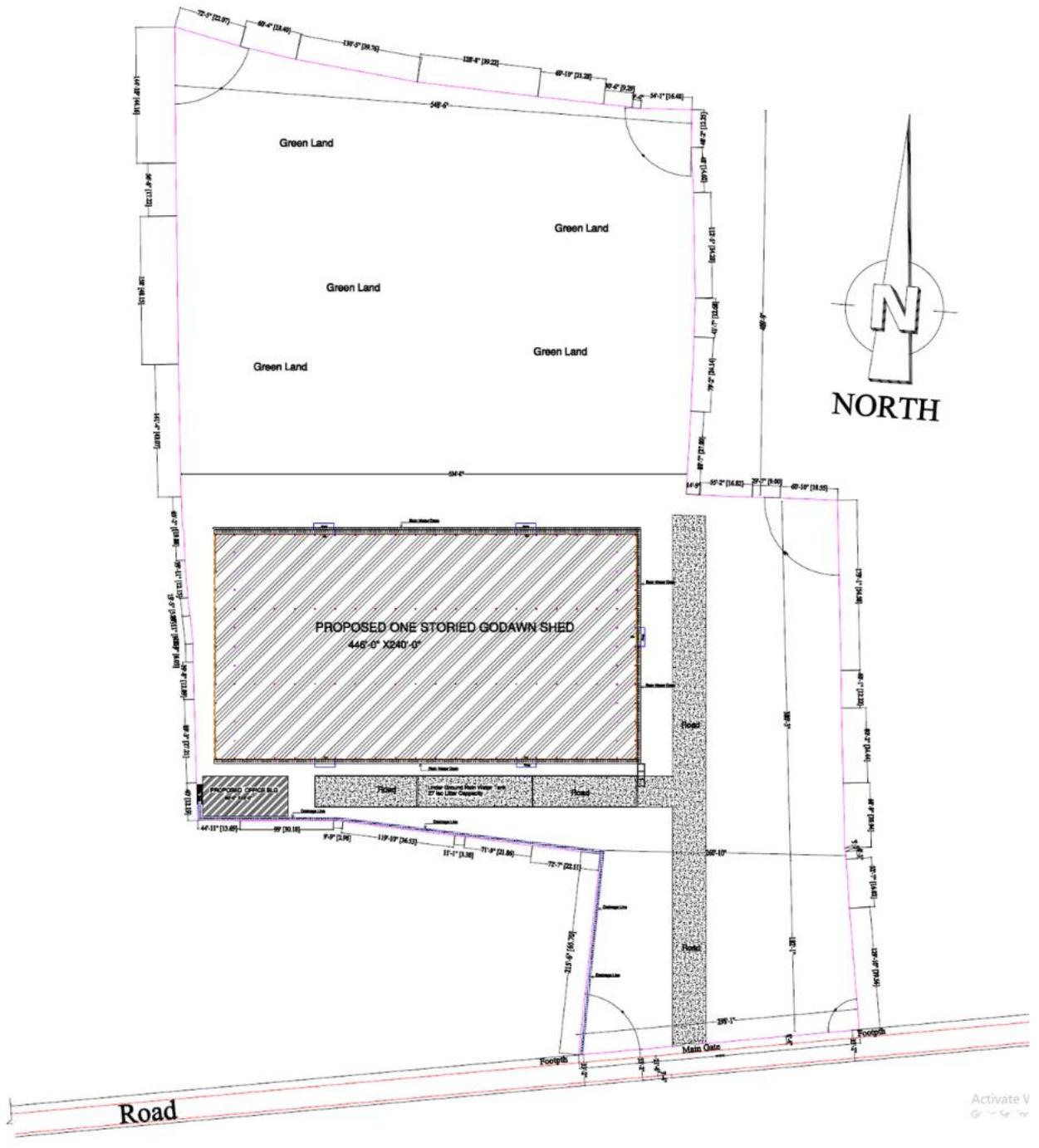


FIGURE 1-1 MIDLAND KNITWEAR LIMITED LAYOUT

The salient feature of the proposed project-

Name of the Project	<b>MIDLAND KNITWEAR LIMITED</b>
Type of Company	Private Company Limited by Shares
Project Proponent	M. Shamsuzzaman
Designation	Managing Director
Location	52/03, Block- E, Shantinagar, Shiddhirganj, Narayanganj City Corporation, Narayanganj.
Coordinate of the project	<b>23°46'22.2"N latitude and 90°33'31.5"E longitudes</b>
Project area	According to the fire service license, the factory area is 1 26 800 square feet. The total land area in 306 Decimals as per NOC
Final Products	Fabrics knitting, Dyeing Finishing.
Production Capacity	<ul style="list-style-type: none"> <li>❖ Dyeing - 40 Ton per day</li> <li>❖ Fabrics - 4.6 million kg/ year</li> <li>❖ Polo Shirt - 94.4 million pcs per year</li> </ul>
Sales	Foreign 100%
Locally procured raw materials	Furniture & fittings, consumables (welding's rod, Oxygen, LPG, electricity), steel pipes, Steels angles
Manpower	More than 300 Persons, both male and female
Power Requirement	The main power connection line is BREB. 2 MW
Alternative Source	Generator and Solar Power
Source of Water	Deep tube-well
Wastewater Treatment, ETP	The project produces a considerable amount of industrial waste from the dyeing section. The wastewater will be treated with 100 <b>m<sup>3</sup> per hour ETP. The drawing and design are attached as an annexure.</b>
Estimated Solid waste generation	All the solid waste is sold to a 3 <sup>rd</sup> party.
Safety and Emergency Preparedness	Fire extinguishers, Fire alarm systems, Fire pumps, Fire escape route, Fire hydrant and hose reel, Smoke detector, Sound screening mechanism, and Ramp for handicapped people

Proper mitigation measures will be taken to reduce waste generation and mitigate environmental pollution. The proponent is concerned about the environment and building an environmentally sustainable project.

## 1.1 DESCRIPTION OF EXISTING ENVIRONMENT

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### 1.1.1 PHYSICAL ENVIRONMENT

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#### **Climate, Geology, Soil**

The region has a tropical climate. There are two marked seasons: the rainy season from April to October, during which more than 85% of the total annual rainfall occurs, and the dry season from November to March. The maximum average temperature was around 36.3°C in April 2022, and the minimum average temperature was 25°C in January 2022. The maximum average relative humidity for the project area is 71% in July 2022, whereas the minimum relative humidity is 51% in March 2022.

#### **Air Quality**

Ambient concentrations of SPM, NO<sub>x</sub>, and SO<sub>2</sub> are lower compared to the national air quality standard. The area's apparent ambient air quality was good during the site visit.

#### **Noise**

As part of the EIA, noise level measurements were conducted at different locations within the complex. The noise level was also measured at the adjacent road near the existing site, showing that it doesn't exceed the allowable level for the Industrial area. The Project will also be responsible for developing an eco-friendly ecosystem around the project area through community cooperation.

#### **Water Quality**

In-house analytical reports of groundwater show that the measured parameters satisfy the Bangladesh industrial water standard. The depletion of groundwater is generally being recharged mainly by rainwater infiltration. MTL supplies water from its deep tube well with WTP and strives to reduce water consumption.

#### **Socio-economic Environment**

As a part of the Environmental Impact Assessment, a rapid socio-economic short study was carried out to assess the current baseline of the socio-economic condition of the areas surrounding the proposed project site (1 km). Efforts were made to identify the socio-economic attributes the existing project activities may impact. The study area has a mixed socio-economic environment; thousands of people with diverse occupations (day laborer to service holder) live there. The people of the study area are predominantly Muslim. Educational institutions are present in the area. The local economy depends primarily on the surrounding industrial establishments and small businesses.

Gas is available in the area; 100 percent of respondents use gas for cooking. The majority of respondents use groundwater as a source of domestic water. About 100 percent of respondents reported having concrete toilets. Almost half of all respondents reported getting health care from a private clinic. Most respondents are pretty happy with the overall quality of educational facilities available in their localities.

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### 1.1.2 POTENTIAL ENVIRONMENTAL IMPACTS

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Environmental Impact during Future Construction Phase

#### **Physio-chemical Impacts**

##### **Impact on Water Quality and General Environment**

Waste and wastewater generated during the construction phase of the project include construction debris and wastes, and some other solid wastes (e.g., from labor sheds), human wastes from people working at the project site (e.g., from labor sheds), and some liquid waste from construction processes. These waste/ waste water could lead to pollution of water and general environment, if not properly disposed.

##### **Air Quality & Noise Level Impacts**

During the construction phase, the important sources of emissions would include those from the operations of construction equipment and machineries, project vehicles carrying construction materials/ debris to/ from the site. Particulate matter may be generated from stone (aggregate) crushing, earthworks, material storage areas, and unpaved roads. From the noise model simulation, the noise level would not exceed the baseline level during the construction (new construction building within complex).

##### **Public Health:**

The construction activities are likely to have some impact on health and wellbeing due to increased noise pollution and vibration, and air pollution. Solid wastes generated by the construction activities may create environmental pollution and thus affect public health, if not properly disposed. Proper measures including regular maintenance of equipment and use of protective gear are needed to reduce the risk of accidents during the construction phase.

##### **Employment:**

Some job opportunities will be created for labors as well as skilled manpower (including literate people) for construction of the group. Installation of the plant will require relatively small number of skilled personnel and laborers as such installation is highly automated.

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### 1.1.3 ENVIRONMENTAL IMPACT DURING OPERATION PHASE

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The impacts of group activities on water, air and ecological parameters (e.g., floral and faunal habitat and diversity) are mostly insignificant. The effects of project activities on a number of physio-chemical environmental parameters have been assessed. These parameters include noise level, water quality, and air quality. The project at its operation phase impacts on Job Creation, Support of local Business, Infrastructure development, Revenue to Local Municipal Council will be mostly beneficial.

##### **Water Quality Impacts**

Storm water runoff is the most common way that non-point source pollution reaches local rivers, creeks, lakes, ponds and wetlands. Rainwater may carry contaminants and sediments if the water is not absorbed by soil and vegetation. Unpaved, uncovered or bare soil surface can lead to soil erosion and ultimately silt deposited in the nearby water body. Runoff can also have organic and inorganic impurities left behind unconsciously over the ground and deteriorate the water quality. So, rainwater flow is another problem in any project. Rainwater harvesting can solve the problem.

The Project has taken indicatives of 3 years extended 3R plan belonging to the following sectors:

- ✦ Water and wastewater recycling from ETP and other areas.
- ✦ Energy saving practices based on 3Rs.
- ✦ Waste management is based on the 3Rs.

### **Air Quality**

It is expected to have minimal impact on the surrounding environment's air quality. The effect of stack emissions (NO<sub>x</sub>, SO<sub>x</sub>, SPM) on ambient air quality has been assessed. The air quality parameters (NO<sub>x</sub>, SO<sub>x</sub>, and SPM) are within the national standard.

### **Noise Impacts**

To resist the noise generated by group activity, it is recommended that a green belt be developed around the periphery of the group roadside area.

### **Public Consultations**

The socio-economic study was conducted during a site visit. A total of 50 people were interviewed. A wide range of stakeholders (e.g., businessmen, laborers in factory/ industry, teachers, students) participated in the interview. EIA team members and MNL representatives also participated in the interview.

Most of the interview session participants were very supportive of the project MNL. They believe that the project would ultimately improve the area's overall socio-economic condition. The participants identified several potential adverse impacts from the existing project, including air and noise pollution, and suggested some mitigation measures.

## **1.2 MITIGATION MEASURES AND ENVIRONMENTAL MANAGEMENT**

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Environmental management and monitoring activities for the existing factories could be divided into management and monitoring: (a) during future construction phase, and (b) during operation phase. The environmental management program should be carried out as an integrated part of the project planning and execution.

The environmental management during the future construction phase should primarily be focused on addressing the possible negative impacts arising from: (a) Generation and disposal of industrial wastewater, sewage, solid waste and construction waste, (b) Increased traffic, (c) Generation of dust (particulate matter), (d) Generation of noise, and (e) Deterioration of water quality. The

environmental management should also focus on enhancing the possible beneficial impacts arising from employment of local workforce for construction works.

The environmental management during the operation phase should primarily be focused on addressing the following issues: (a) Emission from the plant, (b) Generation of noise, and (c) Waste & wastewater generation at the plant.

Following Table summarizes the potentially significant environmental impacts during construction & operation phase, the measures needed to eliminate or offset adverse impacts and enhance positive impacts.

Project Phase	Potential Impacts	Mitigation/Benefit Enhancement Measures
Plant Location	Disruption of the earth surface	An adequate drainage system should be constructed to ease the area's natural drainage system.
Any Future Construction Phase	Consumption of construction materials	Materials should be adequately carried out so less pollution occurs.
	Ambient Air Quality	Machinery and dust-generating activities should be located away from sensitive receptors. Best practices such as vehicle cleaning and routine maintenance should be implemented for all project equipment and machinery.
	Disturbance of wildlife	Strict rules against logging outside the approved construction areas and against wildlife hunting and poaching will be imposed on project staff, workers, and all contractors and personnel engaged in or associated with the Project, with penalties levied for anyone caught carrying and using firearms, or using animal snares and traps, including fines and dismissal. The project owner shall be directly responsible for disseminating to its staff and workers all rules, regulations, and information concerning these restrictions, as well as the punishment that can be expected if any staff worker or other person associated with the project violates rules and regulations about disturbing wildlife.
	Workplace noise	Construction activities that may generate harmful noise should be limited only during the day, e.g., from 6 a.m. to 6 p.m.
	Local purchase of goods	Local products should be purchased as local businesses rise.
	Hiring of local people	Employ local jobless people wherever possible.

Run of erosion	Proper compaction should be done after each layer of earth filling. Avoid earth filling in the rainy season
Worker accident	Set up warning signs and signals and provide workers with helmets in accordance with relevant accident prevention and work safety procedures. Restrict access to the work site.
Sanitation diseases hazard	Supply good quality drinking water to the workers. Provide well-planned sanitary facilities. Provide regular health inspections among workers. Promote health education campaigns among workers. On-site toilets in working areas and toilet facilities at worker camps should be installed with an adequate number of workforces
Noise/vibration hazard	Make a working setup & program according to the local situation. Appropriate and sufficient PPE for noise protection shall be provided to all workers.
Traffic congestion	Avoid carrying of construction materials in peak hour of road traffic. A traffic plan should follow.
Liquid Discharge	Take care of the project's ETP and plumbing system. Ensure proper sanitation facilities Reduce water use Good water practice Increase awareness and training
Solid Waste	Organize proper collection and transportation of all solid wastes. Install a proper solid waste disposal system.
Air quality	Provide proper stack height.
Occupational health	Make the workers aware of hazardous materials and proper handling methods, and provide masks, aprons, ear plugs, and hand gloves to the workers. Provide regular health inspections among workers. Promote health education campaigns among workers. Use PPE
Employment	Employ local jobless people wherever possible.
Accidental, Fire and Natural Hazard	Open water body/reservoir for rainwater storage A disaster management plan is also prepared for natural and accidental hazards and Fires.
Contaminated with chemicals and hazardous into environment	Register and record all potentially hazardous chemicals and waste with their movements. Appropriated training should be conducted for all workers responsible for handling hazardous waste

	Meteorology	Adequate recording of meteorological data to be conducted periodically during operation.
	Workplace noise	Separate Utility Building acoustic barrier Buffer zone / Tree plantation Appropriate and sufficient PPE for noise protection shall be provided to workers.

**Major concern's related to the project:**

The project has its own environmental monitoring unit/cell with trained manpower with the necessary equipment and other logistics along with required budget. Midland Knitwear Limited is planning to develop a working relationship with the Department of Environment (DOE) by undertaking a joint monitoring program to monitor ambient environment.

The project authority will also have a well-planned fire safety and disaster management plan. They are obligated to have an expert team for executing the plan and train people emergency response actions for earthquake, landslide and other natural and manmade disasters.

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## CHAPTER 2 INTRODUCTION

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### 2.1 BACKGROUND

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The dyeing industry in Bangladesh forms a crucial part of the country's textile and garment sector, a cornerstone of its economy, and a primary source of employment. Beginning in the late 1970s and gaining significant momentum in the 1980s, the dyeing sector emerged to meet the growing demand for ready-made garments (RMG) in the global market. At this time, Bangladesh was transforming into a key player in low-cost garment production, appealing to international brands seeking affordable and reliable sourcing. The dyeing industry quickly became an essential part of this ecosystem, adding value to raw fabrics through vibrant colors, unique patterns, and finishing techniques that made Bangladeshi textiles more appealing to consumers worldwide.

However, this rapid expansion brought several challenges, especially concerning environmental impact. Traditional dyeing processes are resource-intensive, requiring large volumes of water and various chemical agents. In the early stages, many dyeing factories operated without adequate waste management systems, leading to untreated wastewater and chemical effluents being discharged directly into rivers and waterways. This practice contributed significantly to water pollution, affecting aquatic ecosystems and nearby communities. Recognizing the environmental risks, both the Bangladeshi government and international regulatory bodies introduced stricter laws, mandating the use of Effluent Treatment Plants (ETPs) and encouraging sustainable practices such as Zero Liquid Discharge (ZLD) systems, which aim to eliminate wastewater discharge by recycling and reusing water.

In recent years, the pressure from international buyers for sustainable practices has grown. Many global brands now require their suppliers to follow environmentally responsible practices, and compliance has become essential for maintaining export relationships. To adapt, numerous dyeing factories in Bangladesh have started investing in more advanced and sustainable technologies, such as automated dyeing machines that use less water and energy. Some factories have adopted low-water dyeing and digital printing methods, significantly reducing the dyeing process's environmental footprint. Additionally, partnerships with foreign firms have introduced advanced knowledge and technology transfer, enabling Bangladeshi dyeing facilities to enhance efficiency and environmental standards.

The dyeing industry mainly concentrates in vital industrial zones, including Dhaka, Gazipur, Narayanganj, and Chittagong, where extensive infrastructure supports large-scale production. These industrial zones are economic hubs that contribute substantially to Bangladesh's GDP and provide vast employment opportunities, particularly for rural workers who migrate to urban areas for job prospects. The industry also supports a wide network of secondary businesses, such as suppliers of dyes, chemicals, and machinery, creating a ripple effect across the economy.

Today, the Bangladeshi dyeing industry stands at a critical juncture. While it contributes to economic growth and employment, the sector is under increasing scrutiny to balance these benefits with environmental responsibility. Though challenging, the push towards greener practices offers the potential for Bangladesh to solidify its position as a leader in sustainable textile manufacturing. By aligning with global environmental standards and investing in innovation, the dyeing industry

in Bangladesh aims to remain competitive in the international market while meeting the demands of an eco-conscious consumer base. This journey reflects the broader goals of Bangladesh's textile sector, which seeks to drive sustainable and sustainable economic growth, ensuring a lasting positive impact on the industry and the environment. **Engineer M. Shamsuzzaman, managing director of Midland Knitwear Limited**, has proposed setting up this project. According to the ECR 2023, the project is categorized as **Green** as per Schedule 1. The proponent of Midland Knitwear Limited has requested 'Global Environmental & Textile Technological Services (GETTS)' to prepare an EIA report on this project as per the DoE guideline. Accordingly, this EIA report has been prepared.

**Midland Knitwear Limited** already got **TOR approval from DoE memo no. 22.02.6700.140.72.028.23.126, issue dated- October 18, 2023.** The said project is close to the Dhaka- Narayanganj Highway. The project area has various communication facilities. It is accessible through the Dhaka- Narayanganj Road.

Every physical development project directly or indirectly interacts with various components of the environment in a complex manner and significantly impacts the environment. It is essential to assess the direction and magnitude of the impacts of a development project to avoid unforeseen harmful consequences that would affect the desired benefit and sustainability of the project. EIA is a helpful tool for estimating the potential Environmental Impacts of a proposed project with the provider of mitigation measures and an Environmental Management Plan (EMP) within a very short period based on information from both primary and secondary sources.

This document, the Environmental Impact Assessment (EIA), has been prepared for **Midland Knitwear Limited** to address the environmental impacts resulting from the project. It is based on reviewing and updating the environmental impact assessments, mitigations, and management plans. During the detailed design, the EMP shall be further updated as a stand-alone EMP for each procurement package and appended to the contract document. This will allow the document to integrate environmental provisions and management measures.

## **2.2 INTRODUCTION TO EIA**

---

Environmental impact assessment (EIA) is an environmental decision support tool that provides information on the likely impacts of development projects to those who make the decision as to whether the project should be authorized. The purpose of an EIA is to determine the potential environmental, social, and health effects of a proposed development so that those who make the decisions to develop the project and authorize the project are informed about the likely consequences of their decisions before they make those decisions and are thereby more accountable. It is intended to facilitate informed and transparent decision-making while seeking to avoid, reduce or mitigate potential adverse impacts through the consideration of alternative options, sites, or processes.

An EIA is conducted in response to a project proposal, so the assessment procedure is project-centered. That is, the procedure is molded around the normal project planning process. This concept is called integrated project planning. Integrated project planning requires the project planner to assess and evaluate his planning decisions considering the technical, economic, social,

and environmental factors. It implies that EIA should be a continuous process throughout the course of project planning.

EIAs and environmental management tools effectively complement other main planning tools, such as economic analysis and feasibility studies, as they assist decision-makers (regulatory bodies, Project Proponents, etc.) to ensure their project plan is economically, environmentally, and socially sound and sustainable. Since project planning and development involve various stages of different scales, it is essential to understand the role of each stage in the project planning and development cycle.

## **2.3 STEPS IN THE EIA PROCESS**

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The EIA process comprises six key steps:

### **2.3.1 SCREENING**

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Screening is the first step in the process, and it helps to decide whether an EIA is required for a project. An appropriately designed screening system can, thus, be an effective tool for preventing the squandering of time and money on assessing projects with insignificant environmental impacts.

### **2.3.2 SCOPING**

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This step begins after screening has decided on the requirement for an EIA. Scoping is considered the backbone of the EIA process and is ideally undertaken at the project planning stage. The main objective of the scoping process is to establish the environmental and social priorities and set the boundaries for the study and define the Terms of Reference (ToR) for the impact assessment. Systematic and well-planned scoping forms the basis for an effective and efficient EIA process. It also helps avoid unfocused and voluminous reports.

### **2.3.3 BASELINE DATA GENERATION:**

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Baseline data provides a detailed description of the existing status of various environmental and social components in the study area. Both primary and secondary data is collected to describe this status.

### **2.3.4 IMPACT ASSESSMENT**

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In this step, the characteristics of potential impacts are identified, evaluated, and predicted using the baseline information on one hand and the project's features on the other (cause-effect relationship). Impact predictions are usually made by using standard methodologies and models. However, models can be used with care and prudence, as most of them are designed with the requirements of the developed world; also, in most developing countries, the quality of data used to design these models is not always adequate.

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### 2.3.5 MITIGATION OF IMPACTS

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At this stage, the possible preventive, remedial, and compensatory measures for each adverse impact are determined and recommended. The application of mitigation hierarchy (avoidance, minimization, mitigation, compensation/ offset) is adopted.

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### 2.3.6 ENVIRONMENTAL MANAGEMENT PLAN

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An environment management plan (EMP), also referred to as an impact management plan is prepared as part of the EIA reporting process. It translates recommended mitigation and monitoring measures into specific actions that have to be carried out by the proponent. Depending upon specific requirements, the plan may be included in the EIA report or can be prepared as a separate document.

EIA steps are shown in the flowchart:

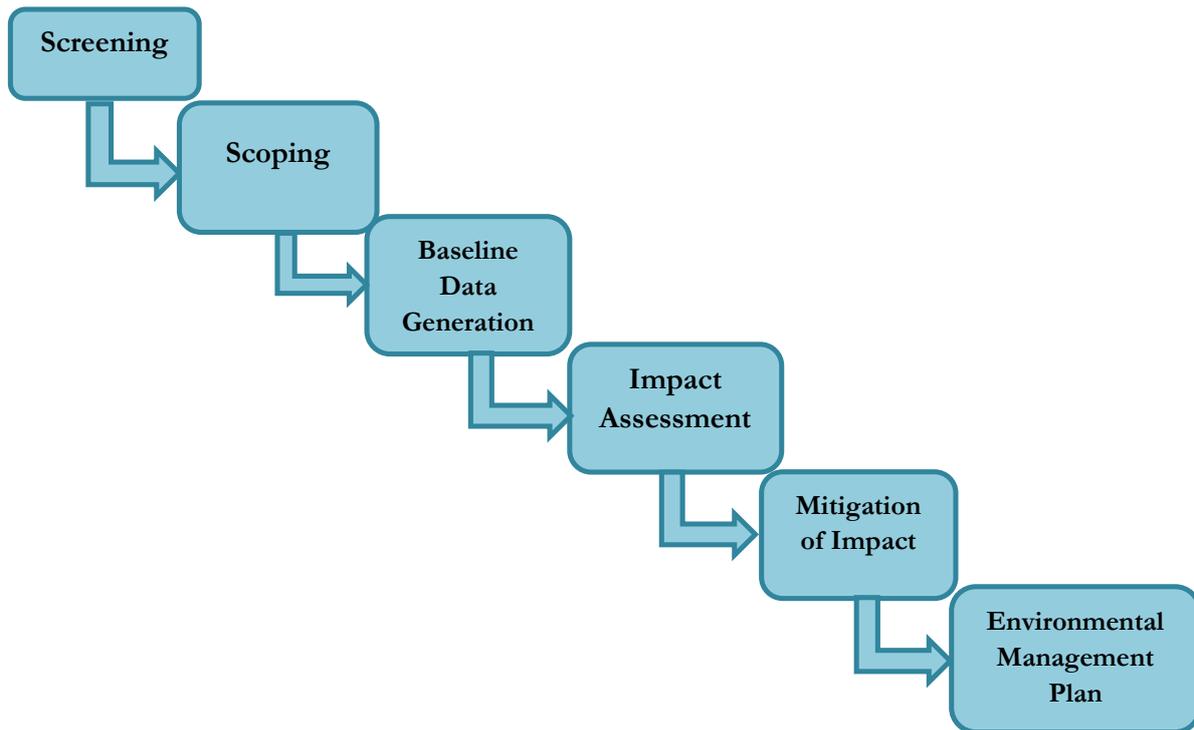


FIGURE 2-1 FLOWCHART OF EIA STEPS

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## 2.4 NEED FOR AN EIA

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The environment is composed of Biotic & A-biotic components. There is a dynamic equilibrium between these components. When a project is undertaken, it tends to disturb the environmental

equilibrium. To maintain the quality of the environment it is essential to study the perspective impacts of the project on the natural environment on time and remedial measures are taken to promote the sustainable and holistic development of the project. Environmental Impact Assessment (EIA) is a process that identifies both the positive and negative environmental effects of significant developments before planning permission is considered. The EIA process is a method of ensuring that planning decisions are made with the full knowledge of the environmental effects and with full engagement of statutory bodies, local interest groups, and members of the public.

An EIA should allow decision-makers to assess a project's impacts in all its phases. It should also allow the public and other stakeholders to present their views and inputs on the planned development. Furthermore, to be truly effective, an EIA must contribute to and improve the project design, so that environmental, as well as socioeconomic measures, are core parts of it. Information used in the EIA needs to be based on good data, use accepted methodological approaches, and be summarized in plain language that is understandable for decision-makers.

Finally, the EIA does not end with the granting of a license to operate. It is critical that the approved practices and design are followed during the project operations and construction and that ongoing monitoring is in place during the lifetime of the project.

1. Identification of potential environmental impacts
2. Studying the significant environmental impacts
3. Assessing the probability of these impacts to be mitigated
4. Recommending preventive and corrective measures to reduce the negative impacts
5. Informing decision-makers and stakeholders on the environmental consequences
6. Giving opinion (council) on whether the development of the relevant investment proposal should continue (M. Sabeva, 2015).

## **2.5 IDEAL EIA SYSTEM**

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An Ideal EIA system would be

- Apply to all projects expected to have a significant environmental effect and address all impacts expected to occur due to that project.
- Compare alternatives to a proposed project, management techniques, and mitigation measures.
- This results in a clear EIS (Environmental Impact Statement), which conveys the importance of the likely and their specific characteristics to non-experts in the field.
- Include broad public participation and stringent administrative review procedures.
- Be timed to provide information for decision-making.
- Be enforceable.
- Include monitoring and feedback procedures.

- Therefore, the purpose of EIA is to help design projects that enhance the quality of the environment by examining alternative and remedial measures throughout the planning and design process.

An ideal EIA system should contain some necessary issues given in the following figure-

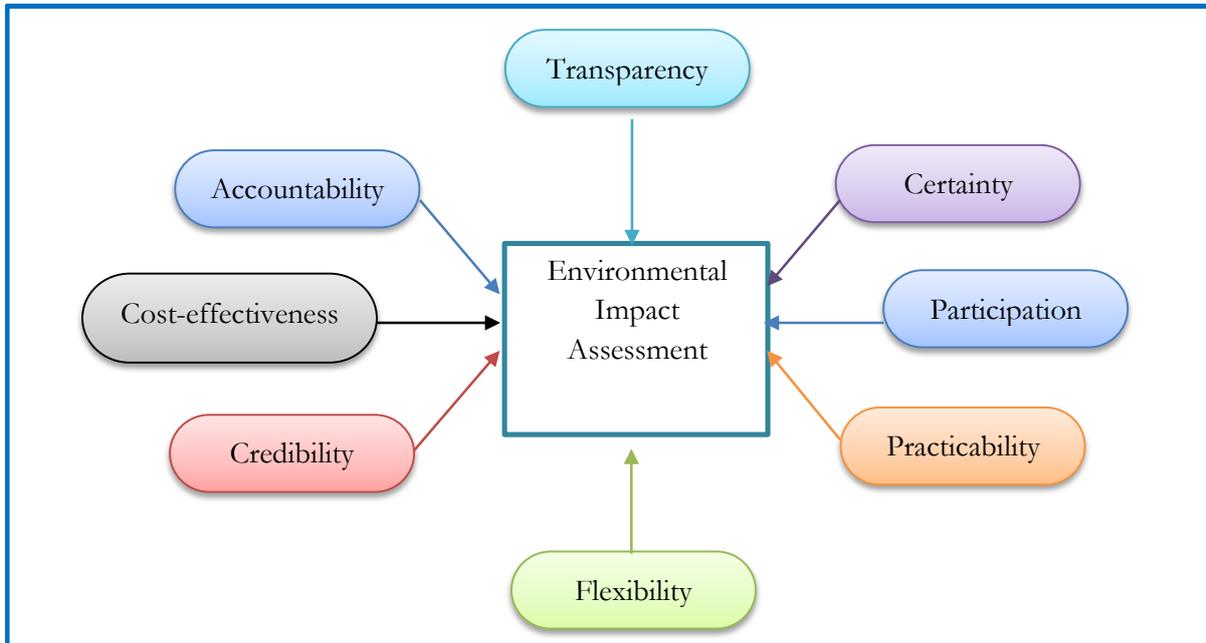


FIGURE 2-2 COMPONENTS OF AN IDEAL EIA

## 2.6 AIMS AND OBJECTIVES OF THE EIA

The study aims to produce a report on the EIA study based on which Environmental Clearance from the Department of Environment (DoE) will be obtained.

The objective of this EIA study regarding Midland Knitwear Limited is to identify and evaluate the potential impacts (beneficial and adverse) and prepare an impact statement following the existing guidelines of the DoE. The study provides information on the environmental implications, which could be used for environmental safeguards.

The EIA report is a document for obtaining environmental clearance from statutory agencies. It also presents the existing environmental setting, the contribution of pollutants, and other factors from the proposed facilities.

The specific objectives of this EIA are to:

- Present a general description of the project and its activities;
- Present a description of the pre-project environment, the physical and biological environment, Delineate the significant environmental issues found and believed to be involved in the project;

- Identify the environmental impacts of the project activities and quantify them to the extent possible;
- Suggest the plan for the management of the environment during the implementation and operation stages.
- Provide information and recommendations on procedures, processes, and practices that must be implemented to attain Environmentally Sound Management (ESM) in the project area.
- Assisted and facilitated the improved management of occupational health and safety issues in or about the workplace.
- Assessment of the socio-economic impacts due to the construction of the said 5-Star Hotel of the proposed project;
- Prepare a detailed Environmental Management Plan (EMP) for the proposed projects to reduce the negative impacts and ensure sustainable development.
- Provide recommendations or guidelines on the successful implementation of the EMP.

The aims and objectives of the EIA study on the proposed **‘Midland Knitwear Limited’** are as follows:

**Immediate Objectives:**

- Modify and improve the Environmental design of the proposal
- Ensure that resources are used appropriately and efficiently
- Identify critical measures for mitigating the potential impacts of the proposal
- Facilitate informed decision-making and set the environmental terms and conditions.

**Long-Term Objectives:**

- Protect Human Health and Safety
- Avoid irreversible changes and serious damage to the environment
- Safeguard valued resources, natural areas, and ecosystem components; and
- Enhance the social aspects of the proposal

**2.7 PERFORMANCE OF THE ASSESSMENT**

---

This report has been prepared on the following basis.

- (a) **Site Visit:** The members of the factory's compliance team and the consultant team visited the factory to determine the possible environmental impacts of the existing factory and recorded the prevailing conditions of the environment as they existed before the implementation of the project.
- (b) **Identification and Evaluation:** The adverse and beneficial effects of the existing factory on the environment have been evaluated.
- (c) **Discussion of Alternatives:** Various possible alternatives have been discussed.
- (d) **Preparation of Checklist:** A checklist has been prepared to ensure complete coverage of all the possible consequences of the Existing factory so that it can be determined what administrative actions should be taken.

- (e) **Developed of Environmental Impact due to the project:** To identify the factory's impact on the environment, a checklist of environmental attributes has been developed that reflects the impact on the environment resulting from a particular action.
- (f) **Set mitigation measures and Environmental Management Plan:** After identifying the Environmental Impacts, the consultant's expert team identified mitigation measures and detailed environmental management plans for the factory.

## 2.8 LIMITATIONS OF THE REPORT

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The impact assessment report (study) prepared for the proposed project is based mainly on the project information from the client, discussion with the local community and other stakeholders, and observations from various surveys and investigations undertaken in the project area. Professional judgment and subjective interpretation of facts have been applied to this study. Any change in the project location, orientation, proposed factory components, or project activities will likely result in variation in the impacts. It is to be noted that any technological advances during construction and operation may have different impacts. An EIA report is prepared based on hypotheses and proves the impact of similar activity. Although the time & resource limitations claim more report integration in the future. Some limitations will remain after all efforts for the following reasons.

First, it is difficult to predict which, if any, of the potential environmental and social issues identified will become actual problems in the future. Environmental regulations, as do the enforcement priorities of the applicable governmental agencies involved, continually change.

Second, even for problems currently identified, it is often difficult and sometimes impossible to accurately estimate the liabilities that may be involved in mitigating the problem(s), for the legal and technological standards for evaluating, mitigating, and allocating liability for environmental issues are in a constant state of change. Moreover, the liability for mitigating environmental problems tends to be highly dependent upon agency negotiations and the sometimes arbitrary and unpredictable nature of agency officials charged with such talks.

## 2.9 MIDLAND KNITWEAR LIMITED COMMITMENTS

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We follow the rules and regulations of land use and are guided by the government and various codes. We always uphold the basic code of conduct that is stated below-

- Child labor is strictly prohibited;
- Providing pure drinking water to the customers;
- No Discrimination for hiring people;
- First aid treatment and legal minimum wages;
- Strictly maintained overtime hours and payments also safety;
- Deliver the social-economic benefits to employees and our dependents to uplift their livelihood;
- Complying with applicable environmental legislation and regulations;
- Conservation of natural resources through responsible management of energy and water use;

- Adopting cost-effective measures in the prevention of pollution from our processes;
- Motivating and preparing all employees to take personal accountability for protecting the environment;
- Planning, implementing, and reviewing environmental objectives and targets;

## **2.10 CONSISTENCY WITH DOE GUIDELINES**

---

Environmental Conservation Act 1995 (ECA'95) is currently Bangladesh's main legislative document relating to environmental protection. Under this act, 'No industrial unit or project shall be established or adopted without obtaining environmental clearance, in the manner prescribed by the rules, from the Director General (DG). A set of the relevant rules to implement the ECA'95 has recently been promulgated (August 1997). The rules mainly consist of:

- Categorized list (green, yellow, orange, and red) of the project;
- Application format to take environmental clearance;
- Ambient standards about water pollution, air pollution, noise, and permitted discharge/emission levels of water and air pollutants and noise by industries.

The Rules incorporate "inclusion lists" of projects requiring varying degrees of environmental investigation, e.g., all the raw projects under the red category generally will require a two-step assessment procedure, firstly an Initial Environmental Examination (IEE) for site clearance, and secondly if warranted, a full Environmental Impact Assessment (EIA) for technical clearance.

## **2.11 SCOPE OF THE WORK IN THE FUTURE**

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Based on the limitation, the scope of work in the future is the following:

- Further consultations with the local community and other critical stakeholders of the project to understand public perception and their expectations of the project;
- Collection of additional secondary environmental, social, and demographic information;
- Collection of information about flora and fauna that required conservation/scientific interest through a primary ecological survey of the study area;
- Identification and review of the applicable standards and identification of key issues;
- Evaluation of potential social impacts of the Project and its components (including associated facilities as per the details available);
- Suggest appropriate institutional arrangement and capacity-building needs to properly implement environmental and social management plans during the pre-construction, construction, and operation phases.

## **2.12 METHODOLOGY**

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The Environment and Social Impact Assessment study for the project has been carried out per the Environment Conservation Act and Rules, 2023 requirements. The environmental impact assessment study considers an area of 1 km around the project site as the study area. Reconnaissance surveys were conducted to identify environmental and social issues in the project

area. A detailed desk-based literature survey was also undertaken, and relevant information was collected for environmental and social baseline assessment.

Global Environmental & Textile Technological Services (GETTS) also conducted social surveys, and the project-affected village was visited to collect information on the socio-economic and cultural aspects of the local community. Various government departments and other agencies were contacted to gather information relevant to the project or the project area.

Based on the proposed activities, impact analyses were carried out, where potential direct and indirect impacts of the project activities were considered. A detailed Environmental and Social Management and Monitoring Plan (ESMMP) has been formulated for the Project, where measures are proposed to mitigate adverse impacts along with recommended good practices.

The following plans have been developed for the project, along with impact assessment and identification of mitigation measures.

- Construction Labor-Management Plan;
- Solid Waste Management Plan;
- Liquid Waste Management Plan;
- Gaseous Waste Management Plan;
- Occupational Health and Safety Plan;
- Emergency Response & Fire Management Plan;
- Environment Monitoring Plan;

The schematic diagram of the methods of the report is given in the following figure.

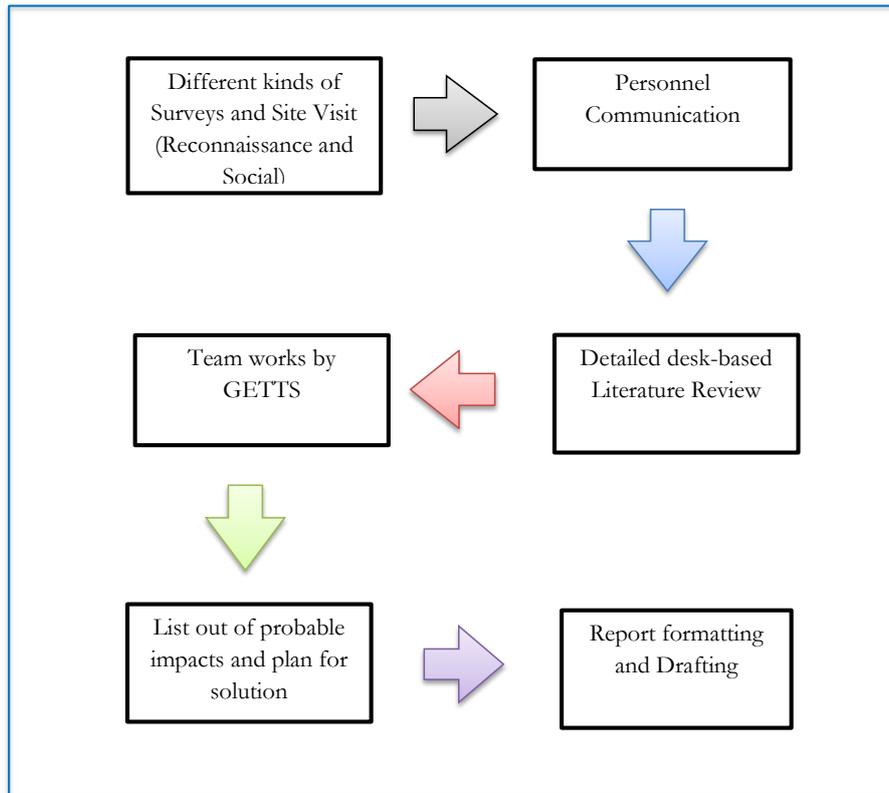


FIGURE 2-3 SCHEMATIC DIAGRAM OF THE METHODOLOGY

### 2.13 A MESSAGE FROM MANAGING

**M. SHAMSUZZAMAN**

**MANAGING DIRECTOR, MICRO FIBRE GROUP**

“Our journey has been nothing short of extraordinary, thanks to our collective commitment to excellence.

At MFG, we are dedicated to delivering top-quality knit products, driven by our state-of-the-art manufacturing units and a skilled workforce that shares our vision. The enduring partnerships we have built speak volumes about our reliability and ethical practices.

As we move forward, the future holds great promise for us. We are embracing sustainability and innovation to drive our growth, co-creating with our clients to stay at the forefront of the fashion industry.

Our success is a result of each team member’s dedication and passion. Let us continue to inspire one another, united in our pursuit of greatness. Together, we will shape a brighter, more sustainable tomorrow.”

**2.14 EIA TEAM**

A good qualified, knowledgeable and energetic team of Global Environmental and Textile Technological Services has participated to make this EIA report. They are experts in different fields of engineering, science, and sociology. During the preparation of this report, they have sat together, round table meetings, field visits, conversations with clients and people nearby the project, etc.

TABLE 2-1 EIA TEAM

S. L.	Profile	Details		Objects
1	<b>Engr. Md. Golam Kibria</b>	Designation	Chief Executive	Obtain a challenging leadership position by applying creative problem-solving and fine management skills with 15 years of experience. Passionate to achieve optimum utilization of its resources and maximum profits.
		Title	Supervisor	
		Qualification	B.Sc. Tech (Textile)	
		Experience	15 years	
		Institution	Bangladesh Textile University, Tejgaon	
	Contact No.	01711231512		
		Mail ID	enr.kibria_2010@yahoo.com	
2	<b>Md. Mostafizur Rahman, PhD</b>	Designation	<b>Associate Professor</b>	An Environmental Specialist. Creative problem-solving personality and a workaholic person.
		Title	Chief Executive	
		Qualification	<b>PhD, Environmental Sciences</b>	
		Experience	>15 years	
		Institution	<b>Department of Environmental Sciences Jahangirnagar University</b>	
		Mail ID	<b>rahmanmm@juniv.edu</b>	
3	<b>SK. Abdul Latif</b>	Designation	Mechanical Engineer	Dedicated individual with verse knowledge. Exceptionally good mechanical competence ·Excellent expertise in using CAD to explain and present the blueprints of the final structures
		Title	Team Member	
		Qualification	Dip. in Mechanical Eng., KPI	
		Experience	10 years	
		Institution	Narayanganj Polytechnical institute, Narayanganj	
		Mail ID	latif_pintu@yahoo.com	
4	<b>Md. Mizanur Rahman</b>	Designation	Civil Engineer	An excellent academic record, ability to understand and work knowledge of Civil Structure, and a strong field experience in ETP Installation
		Title	Team Member	
		Qualification	Dip. in Civil Engr. PPI	
		Experience	10 years	
		Institution	Pabna Polytechnical Institute, Pabna	
		Mail ID	<a href="mailto:mizanglobal14@gmail.com">mizanglobal14@gmail.com</a>	

S. L.	Profile	Details		Objects
5	<b>Md. Shaik Hassan Ashik</b>	Designation	Team Member and Author	Experienced chemist with solid math and data analysis skills. Seeking to utilize a working knowledge of chemistry and experience as a Chemist.
		Title	Environmental Chemist	
		Qualification	MSc. In Chemistry	
		Experience	3 Years	
		Institution	Jagannath University, Dhaka	
		Mail ID	ashik111955@gmail.com	
6	<b>Shumya Jannat</b>	Designation	Environmental Executive	Performance-driven and motivated Environmental Engineer recognized for conducting professional site inspections and detailed project field assessments.
		Title	Team Leader	
		Qualification	B.Sc. &M. Sc. in Environmental Sciences	
		Experience	3 years	
		Institution	Jahangirnagar University	
		Mail ID	shumya.getts@gmail.com	
7	<b>Arifa Khatun</b>	Designation	Environmental Engineer	Motivated problem solver with a bachelor's degree in engineering and a background in technical seeking Environmental Executive position
		Title	Team Member	
		Qualification	BSc. in Env. Technology	
		Experience	5 years	
		Institution	Pabna polytechnical Institute, Pabna	
		Mail ID	arifakhatun1997a@gmail.com	
8	<b>Saiful Islam Bivor</b>	Designation	Environmental coordinator	Provide technical & Management System Consultancy to organizations on Quality, Health Safety & Environment based on International Standard Requirements.
		Title	Team Member	
		Qualification	B. Sc. in Environmental Sciences	
		Experience	1 year	
		Institution	Independent University Bangladesh	
		Mail ID	bivorislam24@gmail.com	
9	<b>Laila Tul Zannat Jyoti</b>	Designation	Environmental Engineer	Inspect industrial or municipal facilities or programs to evaluate operational effectiveness or ensure compliance with environmental regulations.
		Title	Team Member	
		Qualification	B.Sc. in Civil Engineering	
		Experience	Fresher	
		Institution	Narayanganj University of Engineering & Technology	
		Mail ID	lzannat@yahoo.com	

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**CHAPTER 3 ACTS, POLICIES, RULES & REGULATIONS**

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**3.1 OVERVIEW**

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Effective project planning requires not only good technical expertise but also proper understanding of government policies relevant to environmental protection and management. An understanding of these policies is useful to ensure that development projects are undertaken in a manner that does not conflict with stated policies but ideally complements them. Additionally, the legal and administrative requirements and procedures that affect a project are important considerations, especially during the stage of planning approval.

Various national policies and legislations that are prescribed in the country are of relevance to environmental protection and management. While there are those that are of direct relevance to environmental pollution control, many of the other policies and legislations relate to resource protection and conservation, and these include forest, fisheries, land, mineral resources, community and occupational safety & health, and others. Although these environment and social-related legislations fall within the responsibilities of other agencies and authorities, they nevertheless need to be understood as EIA requires a holistic approach to be adopted in order that a comprehensive assessment to be achieved.

It is good EIA practice to make it a point to review statutory and non-statutory requirements for a project, as this will provide a clear understanding of how best an EIA can proceed. Clearing the legal and administrative requirements of authorities is as important in project planning as does clearing the technical and financial concerns. A summary of the legal and administrative requirements for the project within an EIA report will assist the Project Proponent and the authorities keep into focus on environmental objectives during the EIA review process.

This chapter highlights some of the more important statutory and non-statutory requirements that may directly or indirectly affect the planning and development of a project in the industrial sector. It is, however, incumbent on the Project Proponent, and the Consultant/ assessor engaged to undertake an EIA, to review these and other legislation and authority requirements each time a project is undertaken, as changes in the form of new legislation or amendments to older ones may be made from time to time.

**3.2 LEGAL ENFORCEMENT AGENCIES**

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The responsibility for formulation, implementation, and modification of national-level environmental laws in Bangladesh lies with the Ministry of Environment, Forests and Climate Change (MoEFCC). The Department of Environment (DoE) was established under the Environmental Pollution Control Ordinance, 1977 which functions under the MoEFCC. It is responsible for carrying out the purposes and provisions of the Environment Conservation Act, 1995 as amended till 2010 (hereinafter referred to as ECA) which is the umbrella legislation regulating environmental issues in the country. A brief description of the relevant legal enforcement agencies has been described below-

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### 3.2.1 MINISTRY OF ENVIRONMENT, FORESTS, AND CLIMATE CHANGE (MOEFCC)

---

The MoEFCC is the nodal agency in the administrative structure of the Central Government, for the planning, promotion, coordination, and overseeing the implementation of environmental and forestry programs. It oversees all environmental matters in the country and is a permanent member of the Executive Committee of the National Economic Council.

It plays a pivotal role as a participant of the United Nations Environment Programs (UNEP). Its principal activities include:

- Conservation & survey of flora, fauna, forests, and wildlife;
- Prevention and control of pollution; and
- Forestation & regeneration of degraded areas and protection of the environment in the framework of legislation.

---

### 3.2.2 DEPARTMENT OF ENVIRONMENT (DOE)

---

An Environment Pollution Control Board was set up under the Environment Pollution Control Ordinance, 1977. It underwent a series of subsequent restructuring and was finally renamed as Department of Environment in 1989. It is headed by a Director-General appointed by the Government.

The DoE through its head, divisional, and district-level offices conduct the following principal activities:

- Advising the Government to avoid such manufacturing processes, commodities, and substances which are likely to cause environmental pollution;
- Advisory and issuing directions to the concerned person regarding the environmentally sound use, storage, transportation, import, and export of a hazardous substance or its components;
- Conducting inquiries and research activities on conservation, improvement, and pollution of the environment and helping any other authority/organization regarding the same;
- Collection and publication of information about environmental pollution;
- Conducting programs for observation of drinking water quality and issuing directives if necessary for adherence to drinking water quality standards;
- Formulation of environmental guidelines;
- Prescribing and modifying environmental quality standards regarding air, water, noise, vehicular emissions, etc.;
- Issuing Location Clearance and Environmental Clearance Certificates to projects; and
- Implementation of provisions of ECA and rules made thereunder.

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### 3.2.3 WATER RESOURCES AND PLANNING ORGANIZATION (WARPO)

---

It was established under the Water Resources Planning Act, 1992. Its core functions include:

- Monitoring the implementation of the National Water Management Plan (NWMP);

- Upkeep of water resource assessments;
- Maintenance, updating, and dissemination of the National Water Resources Database (NWRD) and MIS;
- Secretariat to the National Water Resources Council (NWRC) and the Executive Committee of the National Water Resources Council (ECNWRC);
- Responding to the NWRC/ECNWRC requests for information and advice;
- Periodic update of the NWMP;
- Assisting other agencies in planning, monitoring, studies, and investigations;
- Adhoc advice on policy, strategy, institutional and legal issues;
- Laying down effluent discharge standards into the river in consultation with DoE; and
- Special studies and research as required.

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#### 3.2.4 BANGLADESH POWER DEVELOPMENT BOARD (BPDB)

---

It is a statutory body created on May 1, 1972, and is responsible for the major portion of the generation and distribution of electricity mainly in urban areas except for Dhaka and the West Zone of the country.

It has undertaken a massive capacity expansion plan to add about 10500 MW generation capacities in the next 5 years to achieve 24000 MW Capacity according to Power System Master Plan (PSMP) 2021.

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#### 3.2.5 BANGLADESH ENERGY REGULATORY COMMISSION (BERC)

---

It was established under the Bangladesh Energy Regulatory Commission Act, 2003. Some of its key functions include:

- The issue, cancel, amend and determine conditions of licenses, exemption of licenses, and determine the conditions to be followed by such exempted persons;
- Regulation of generation, storage, supply, and transmission of energy;
- Determine tariff for electricity distribution etc.;
- Ensure control of the environmental standard of energy under existing laws;
- Extend cooperation and advice to the Government, if necessary, regarding electricity generation, transmission, marketing, supply, distribution, and storage of energy.

---

#### 3.2.6 MINISTRY OF LABOR AND EMPLOYMENT (MOLE)

---

It was established with the following objectives:

- Creation of employment opportunity;
- Creation of semi-skilled and skilled manpower;
- Enhancement of productivity of factories by creating friendly working environment between workers & employers;
- Ensuring the welfare of workers in different industrial areas;
- Implementation of labor laws;
- Fixing up minimum wages of labor; and

- Ensuring justice through Labor Court.
- It has been divided into four departments, viz:
- Directorate of Labor
- Chief Inspector of Factory and Establishment
- Minimum Wages Board
- Labor Appeal Tribunal

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### 3.2.7 MINISTRY OF LAW AND PARLIAMENTARY AFFAIRS

---

This ministry is divided into the Law and Justice Division and the Parliamentary Affairs Division for functional purposes.

The Law and Justice Division of the Ministry of Law, Justice, and Parliamentary Affairs has the responsibility of providing legal advisory services to other ministries, divisions, departments, and organizations of the Government.

The parliamentary affairs division is assisted by the law commission and the human rights commission and its main function lies in formulating, scrutinizing, and preparing legislation. When needed, it provides legal opinions and translations for other ministries.

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### 3.2.8 MINISTRY OF LAND

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The ministry of land is in charge of land administration, management, and development for the overall growth of the nation. The Ministry manages Government-owned lands, vested properties, and abandoned properties. It is responsible for the collection of land development tax, land surveying, and record-keeping and updating. Land Acquisition and requisition fall under the responsibilities of this ministry.

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### 3.2.9 BANGLADESH INVESTMENT DEVELOPMENT BOARD (BIDA)

---

The Board of Investment was established in 1989 by the Investment Board Act. The specific functions of the board are:

- Implementation of all provisions as lay down under The Investment Board Act, 1989.
- To promote domestic and foreign investment as well to enhance the international competitiveness of Bangladesh;
- To identify the hindrance of investment and provide necessary facilities and assistance in the establishment of industries.

---

### 3.2.10 UNION PARISHAD

---

Union Parishad (UP) currently is the only elected statutory local government body for rural Bangladesh. A UP consists of a chairman and twelve members. They are elected based on adult franchises. Each UP has a full-time Secretary, appointed by the Deputy Commissioner (DC). The functions of UP are:

- Maintenance of law and order and conduction of censuses of all kinds.

- Registration of births, deaths, blind people, beggars, and destitute.
- Planning and implementation of development schemes in the field of agriculture, forestry, fisheries, livestock, education, health, small and micro enterprises, communications, irrigation, and flood control.
- Protection and maintenance of public property such as roads, bridges, canals, embankments, markets, telephones, and electricity lines.

### 3.3 PROJECT BACKGROUND

---

The emerging environmental scenario calls for attention on conservation and judicious use of natural resources. There is a need to integrate the environmental consequences of the development activities and for planning suitable measures in order to ensure sustainable development. The environmental considerations in any developmental process have become necessary for achieving sustainable development. To achieve such goals the basic principles to be adopted are:

- To enhance the quality of environment in and around the project area by adopting proper measures for conservation of natural resources;
- Prevention of adverse environmental and social impact to the maximum possible extent;
- To mitigate the possible adverse environmental and socio-economic impact on the project-affected areas.

The proposed project, the **Midland Knitwear Limited**, is covered under several environmental Policies & legislations pertained with the Government of Bangladesh. All the policies or legislation aimed at the conservation and protection of the environment. The existing policies and legislation, which are relevant to the environment, are described in the following sections.

---

#### 3.3.1 UNITED NATIONS ENVIRONMENTAL PROGRAM (UNEP)

---

UNEP provides the secretariats for the Basel and Stockholm Conventions. UNEP and the UN Food and Agriculture Organization (FAO) jointly provide the Rotterdam secretariat, which is located in Geneva and in Rome.

UNEP is responsible for the implementation of the Basel Convention. It is currently drafting guidelines on the environmentally sound management for the full and partial dismantling of ships, in order to provide recommendations on procedures and practices to be implemented to attain Environmental Sound Management (ESM) in ship breaking yards. The guidelines also provide advice on monitoring and verification on environmental performance. The guidelines are expected to present a "model facility", the realization of which should be reached within 5 years. These guidelines will "make provisions for the proper removal of hazardous wastes and substances, including the collection, sorting and disposing/recycling of wastes in an environmentally sound manner". These guidelines will not, however, cover issues of health and safety.

---

#### 3.3.2 STOCKHOLM CONVENTION ON PERSISTENT ORGANIC POLLUTANTS (POPS)

---

There has been a significant level of debate on production, trans boundary movement and impact of POP's at the international level, particularly during the 1990's. This culminated in the development of the Stockholm Convention on Persistent Organic Pollutants on 22 May 2001; in response to the urgent need for global action to protect human health and the environment from persistent organic pollutants (POPs). This was a major milestone in the efforts to curb the impacts of POPs. At this time, there are] 51 signatories and 11 parties to this convention.'

The Convention seeks the elimination or restriction of production and use of all intentionally produced POPs (i.e. industrial chemicals and pesticides). It also seeks the continuing minimization and, where feasible, ultimate elimination of releases of unintentionally produced POPs such as dioxins and furans. Stockpiles must be managed and disposed of in a safe, efficient and environmentally sound manner. The Convention also imposes certain trade restrictions. The chemicals slated for elimination under the Stockholm Convention are the pesticides oldrin, chlordane, dieldrin, eldrin, heptachlor, hexachloro benzene (HCB), mirex and toxaphene, as well as the industrial chemical polychlorinated biphenyls (PCBs). The Convention also seeks the continuing minimization and, where feasible, elimination of the releases of unintentionally produced POPs such as the industrial byproducts dioxins and furans. The Convention come into effect from 17 May 2004.

### **3.4 APPLICABLE ENVIRONMENTAL AND SOCIAL LAWS, REGULATIONS, AND POLICIES**

---

The requirements for compliance with environmental regulations are laid down by the policy, legal & regulatory framework in the country. A large number of laws are related to environmental issues. Some dating based on the 19th century exist in Bangladesh. The most important of these are the Environmental Conservation Act, 1995 (ECA95) and the Environmental Considerations rules (under the ECA, 1995), ECR 1997 (ECR97), and ECR 2023.

The provision made in the Environment Conservation Act 1995 and Environmental Conservation Rules 1997 are adopted procedures in carrying out the task of Environmental Impact Assessment (EIA) study for the RED Category industry/factory. Including these, other Policies, Acts, and Regulations applicable and consulted for the preparation of the EIA study during the accomplishment of the assignment areas are given below:

#### **3.4.1 NATIONAL ENVIRONMENTAL POLICY 1992**

---

In 1992 the Bangladesh Government developed the National Environmental Policy (NEP) which defines the overall environmental framework and assigns responsibility for regulatory development, administration, and enforcement. This responsibility has been given to the Department of Environment (DOE) which is under the Ministry of Environment, Forest and Climate Change. The National Environment Council, with the head of the government as chairperson, provides the overall policy direction.

In 26 years since the adoption of the Environment Policy, 1992, the nature and level of environment and ecological degradation have been changed. In order to address all those changes and with a view to protect and conserve the environment and ecosystem in a rigorous, pragmatic

and sustainable manner as well as to bring the climate change to the mainstream of the environment and development, the government has revised the National Environment Policy, 1992 and adopted the revised National Environment Policy, 2018.

Following are the key subject matters covered under the National Environment Policy, 2018:

- Ensuring sustainable development through reducing human pressure on nature and natural resources
- Considering environmental protection as an integral part of the development programs planned to meet the need of the present and future generation
- Making natural resources extraction, use, environmental conservation, etc. to be based on science
- Considering environmental impacts and risks in extracting and using natural resources
- Evaluating the economic contribution of ecosystem services simultaneously to that of natural resources
- Giving priority to poor and underprivileged group of people in order to ensure their participation, equity, justice, accessibility to the use of natural resources, and getting ecosystem services on which, they are dependent
- Taking initiatives to prevent misuse and ensure the optimum of water, land, natural gas, and other natural resources in the production process as well as for day-to-day purposes
- Encouraging sustainable use of new and renewable resources
- Enhancing long-term poverty alleviation and food security through conserving biological diversity
- Realizing compensation from persons and institutes those who are liable for environmental pollution through applying the polluter pay principle
- Including environmental conservation and preservation in all national policies and ensuring implementation of the environment policy at both government and non-government levels
- Giving priority to preventive measures over curative measures in environmental conservation
- Including adaptation and mitigation programs in all development projects in order to address the adverse impacts of climate change
- Ensure sustainable utilization of ecosystem goods and services
- Implementation of the 3R principle in the utilization of resources
- Strengthening the institutional and legal capacity of institutions (Government, local, private, and technical) relevant to the enforcement and implementation of rules and regulations relating to environmental policy and environment conservation
- Ensuring considerations of climate change and challenges of calamities in all kinds of infrastructure projects
- Reducing all SLCP (Short-Lived climate pollutants) that are harmful to health and the environment
- Taking development programs considering sustainable production and consumption as an integral part of environmental conservation to meet the need of present and future generation
- Allocating necessary funds to all areas of environmental conservation, preservation, and control

- Taking up programs in favor of a flourishing environment-friendly economy
- Including environmental and ecological conservation particularly to introduce the environmental and ecological concept in the environmental academic curriculum and textbooks of schools and colleges

The policy has provided sector-wise policy coverage for 24 different sectors along with their plan of implementation, identification of respective implementing agencies, legal and institutional framework, and directives on compliances.

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#### 3.4.2 NATIONAL ENVIRONMENTAL MANAGEMENT ACTION PLAN -1995

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The National Environmental Management Action Plan (NEMAP) is a wide-ranging and multi-faceted plan, which builds and extends the statements, set out in the National Environmental Policy NEMAP was developed to address Issues and management requirements during the nod 1995 to 2005 and set out the framework within which the recommendations of the National Conservation Strategy are to be implemented.

- Identification of key environmental issues affecting Bangladesh,
- Identification of actions necessary to halt or reduce the degradation;
- Improvement of the natural environment;
- Conservation of habits and bio-diversity,
- Promotion of sustainable development,
- Improvement of the quality of the life of the people.

One of the key elements of concerns of NEMAP is that the sectoral environmental concerns are adequately identified. In outline, the environmental issues of the industrial sector include-

- Pollution arising from various industrial processes and plants throughout the country causes varying degrees of degradation of the receiving environment (air, water, and soil),
- A general absence of pollution abatement in terms of waste minimization and treatment,
- Low level of environmental awareness amongst industrialists and entrepreneurs,
- Lack of technology appropriate for efficient use of resources and waste minimization, leading to unnecessary pollution of the environment,
- Economic constraints on pollution abatement and waste minimization such as the cost of the new technology, the competitiveness of labor, and intensive production methods as compared to more modern methods,
- The concentration of Industry and hence pollution in specific areas exacerbate localized environmental degradation and exceed the carrying capacity of the receiving bodies,
- Unplanned Industrial development has resulted in several industries located within or close to the residential area, which adversely affects human health and the quality human environment,
- Establishment of industries at the cost of good agricultural lands and in a residential area,
- Lack of incentives for industrialists to incorporate emission/discharge treatment plants in their industries.

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### 3.4.3 BANGLADESH ENVIRONMENT CONSERVATION ACT 1995

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Environment Conservation Act 1995 (ECA-95) is currently the primary legislative framework document related to environment protection in Bangladesh, which repeated the earlier environmental pollution control ordinance of 1977.

The main strategies of the act can be summarized as:

- Declaration of ecologically critical areas, and restriction on the operation and processes which can be caped out or cannot be initiated in the ecologically critical areas,
- Regulation concerning vehicles emitting smoke harmful to the environment,
- Environmental clearance
- Regulation of the industries and provision of other development permits;
- Promulgation of standards for quality of air, water, noise, and soils for different areas for different purposes;
- Promulgation of standard limit for discharging and emitting waste
- Formulation and declaration of environmental guidelines

The first sets of rules to implements the provisions of the Act have been promulgated in 1997 The Department of Environment (DoE) is implementing the Act. A Director General (DG) heads DoE. The DG has complete control over the DoE. The power of DG, as given in the Act, may be outlined as follows:

- Identification of different types and causes of environmental degradation and pollution;
- Instigating the investigation and research into information regarding environmental conservation, development, and pollution,
- Power-to-close down the activities considered harmful to human life or the environment. The operator does have the right to appeal, and procedures are in place for this. However, if the incident is considered an emergency, there is no opportunity for appeal,
- Power to declare an area affected by pollution as an ecologically critical area. DoE regulates the type of work or process which can be undertaken in such an area.
- Similar to the aforementioned clause, if any part of the environment is polluted/damaged by operations, the Director-General can request or force the operator to take remedial measures,
- Operators must inform the Director-General of any pollution incident or 'near miss.'

According to Environmental Conservation Act 1995 (Amendment, 2010) rule 6(Kha)-

In the event of an accidental (pollution) event, the Director-General may take control of an operation, and the respective operator is responsible for costs incurred (and possibly compensation).

Before any new project can go ahead as stipulated under the rules, the operator must obtain an Environment Clearance from the Director-General. An appeal procedure does exist for those promoters who fail to obtain clearance.

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#### 3.4.4 NATIONAL CONSERVATION STRATEGY, 1992

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The national conservation strategy-1992 was endorsed to balance a country's economic development with the conservation and use of its natural resources. The strategy has three overriding objectives: conservation of natural resources, sustainable development, and improved efficiency in the use and management of resources.

The NCS recommended 14 core program areas for priority implementation:

- Maintaining soils in croplands
- Increasing irrigation efficiency;
- Protecting watersheds;
- Supporting forestry and plantations;
- Restoring rangelands and improving livestock;
- Protecting water bodies and sustaining fisheries;
- Conservation of biodiversity;
- Increasing energy efficiency;
- Developing and deploying renewable;
- Preventing/abating pollution;
- Managing urban waste;
- Supporting institutions for common resources;
- Integrating population and environment programs;
- Preserving the cultural heritage.

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#### 3.4.5 ENVIRONMENT CONSERVATION RULES, 2023

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These are the first set of rules, promulgated under the Environment Conservation Act 1995, among other things, these rules set-

- The National Environmental Quality Standards (NEQS) for ambient air, parlous types of water, Industrial effluent, emission, noise, vehicular exhaust, etc.
- Requirement for and procedures to obtain environmental clearance
- Requirement for IEE according to categories of industrial and other development interventions.

The proposed project falls presently under the Orange Category of Environmental Conservation Rules, 2023. According to the rules, all Red category industry has to submit an Initial Environmental Examination in the initial phase of the project start. An Environmental Impact Assessment (EIA) will have to submit before the project operation along with detailed Environmental Management Plan.

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#### 3.4.6 THE ENVIRONMENTAL CONSERVATION RULES (ECR), 2023

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The Environmental Conservation Rules, 2023 are the first set of rules promulgated under the Environment Conservation Act, 1995. ECR, 23 provides additional guidance for specific components of the Act. The rules mainly consist of:

- The National Environmental Quality Standards (EQS) for ambient air, surface water, groundwater, drinking water, industrial effluents, emissions, noise, and vehicular exhaust;
- Categorization of industries, development projects, and other activities based on pollution activities of the existing or proposed industries/development projects/activities.
- Procedure for obtaining environmental clearance;
- Requirement for undertaking IEE and EIA as well as formulating EMP according to categories of industries/development projects/activities;
- Procedure for damage-claim by persons affected or likely to be affected due to polluting activities or activities causing hindrance to normal civic life.

The Rules incorporate “inclusion lists” of projects requiring varying degrees of environmental investigation.

5 | Classification of industrial establishments and projects for the purpose of granting location and environmental clearances. - (1) For the purpose of granting locational and environmental clearances by the Department, considering the extent of activities of the industrial establishments or projects and the scope, extent and possible harmful effects on the environment and human health caused by the same. Industrial establishments and projects shall be divided into the following categories, namely: -

- (A) **Green**;
- (B) **Yellow**;
- (C) **Orange**; And
- (D) **Red**.

Explanation: - as mentioned in this rule –

**(A) Green class** industrial establishments or projects shall mean all such industrial establishments or projects which have relatively little impact on the environment and human health and there is an opportunity to take environmental pollution mitigation measures for such industrial establishments or projects;

**(B) Yellow class** industrial establishments or projects shall mean all such industrial establishments or projects which have a moderate impact on the environment and human health, and to avoid such impacts, these industrial establishments or projects need to take environmental pollution mitigation measures;

**(C) Orange class** industrial establishments or projects shall mean all such industrial establishments or projects which have significant impact on the environment and human health, which need to be avoided for the purpose of environmental protection and the environmental impact of these industrial establishments or projects must be reduced by adopting appropriate environmental pollution mitigation measures. And

**(D) In the red category**, all the industrial establishments or projects that have severe impact on the environment and human health, which need to be avoided to an appropriate extent for environmental protection, and significant environmental pollution mitigation measures must be taken to reduce the environmental impact of the industrial establishments or projects of the said category.

(2) The list of various categories of industrial establishments and projects mentioned in sub-rule (1) shall be determined as per Schedule-1:

Provided that any industrial establishment or project which is not included in the Green, Yellow, Orange and Red categories mentioned in Schedule-1 shall be classified as per Schedule-14.

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### 3.4.7 PROCEDURE FOR GRANTING LOCATIONAL CLEARANCE TO RED CLASS INDUSTRIAL ESTABLISHMENTS AND PROJECTS

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- (1) Red category industrial establishments or project promoters shall apply to the relevant office of the Directorate by filling the applicable sections as per Form-3 for location clearance.
- (2) In the case of making an application mentioned in sub-rule (1), the application processing fee mentioned in schedule-6, related documents, details, draft terms of reference of environmental impact assessment should be submitted and applicable mentioned in schedule-9 Guidelines must be followed.
- (3) The draft terms of reference for environmental impact assessment should be formulated as per the guidelines mentioned in Schedule-10.
- (4) After receiving the application, the relevant office of the directorate shall conduct a site visit to the proposed site of the relevant industrial establishment or project and after reviewing the documents and all relevant matters, a report with an opinion on the rationale of issuing the site clearance and the draft environmental impact assessment (terms of reference) of the head office of the directorate Clearance will be forwarded to the Committee and copies thereof to the Regional and Divisional Offices, as applicable.
- (5) After receiving the documents under sub-rule (4), the concerned office of the directorate shall evaluate and consider all the contents and submit the related report to the Director General for approval.
- (6) After receiving the report under sub-rule (4), if the Director General is satisfied, within 15 (fifteen) working days, he shall grant the positional clearance in favor of the concerned applicant.
- (7) With the approval of the Director General, the concerned industrial establishment or the project promoter shall be given approval of the draft terms of reference for environmental impact assessment from the concerned office within 30 (thirty) working days of receiving the application:

Provided, however, that if any additional information or documents are required, the applicant may be directed to submit the same within seven (7) working days:

It is further provided that if the application is rejected after reviewing the overall aspects, the applicant shall be informed in writing stating the reasons within not more than 7 (seven) working days of taking the said decision.

(8) After obtaining the locational clearance, the concerned industrial establishment or project promoter can start related activities including land development, construction of infrastructure or facilities, and opening of Letters of Credit (L, C).

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### 3.4.8 ENVIRONMENTAL IMPACT ASSESSMENT (EIA) SURVEY

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(1) A red-category industrial establishment or promoter of a project shall prepare an environmental impact assessment report by conducting an environmental impact assessment survey by a registered environmental consultant in accordance with the guidelines laid down by the Department:

Provided that the environmental impact assessment guidelines of any international or development aid organization shall be followed for conducting the environmental impact assessment survey of those sectors for which the department does not have environmental impact assessment guidelines and in this case considering whether it is contrary to the plans, policies or decisions adopted by the government. have to do

(2) Enrolled environmental consultants shall carry out their activities independently and impartially in consultation with all concerned in conducting environmental impact assessment studies;

Provided, however, that the entrepreneur shall be consulted and consulted in formulating the environmental management plan and monitoring program.

(3) The Enlisted Environmental Consultants shall follow the guidelines set out in Schedule-11 in preparing the Environmental Impact Assessment Report and the Environmental Management Plan Report as part of this report.

(4) All the activities, steps, plans or monitoring programs mentioned in the environmental management plan of a red class industrial establishment or project shall be properly followed to the concerned entrepreneur shall be given a declaration in accordance with Form-6.

**Certain criteria and conditions have also been established by the DoE for an industrial plant or project. These are as follows:**

- The location of the industry should be in an area that is/will be designated as an industrial zone, under the town and country planning regulations.
- While selecting sites for red and orange categories, a few considerations are to be kept in mind environmentally/otherwise sensitive areas: nearest human settlement, highway/railway boundary, and high tide line (coastal regions) or natural/modified flood plain boundary.

- Forest land and prime agricultural land should be avoided as far as practicable.
- The plant should adequately provide for storage of solid wastes, treatment of wastewater, use of treated wastewater (if feasible), and a green belt around the perimeter.
- Highly polluting industrial plants should not be located in the vicinity of a recharge area/aquifer, catchment areas prone to floods/earthquakes, and areas of frequent inversions.
- Other factors also need to be considered like induced growth around the industrial site, views of the likely project-affected people, effects on the availability of existing infrastructural facilities to the local population, and assimilative capacity of the receiving body of water.
- It is advisable to shortlist a few potential sites keeping in mind the above criteria, and then select a site with minimal environmental impacts.

Environmental standards in operation in Bangladesh are also promulgated under the Environment Conservation Rules 2023. There are standards prescribed for varying water sources, ambient air, noise, odor, industrial effluent, emission discharges, vehicular Emission, etc.

The Bangladesh standards intend to impose restrictions on the volume and concentrations of wastewater/solid waste/gaseous emission etc. discharged into the environment. In addition, a number of surrogate pollution parameters like Biological Oxygen Demand, Chemical Oxygen Demand; Total Suspended Solids, etc. are specified in terms of concentration and/or total allowable quality discharged in case of wastewater/solid waste. Additionally, specific parameters depending on the manufacturing process are specified such as phenol, cyanide, copper, zinc, chromium, etc. Air emission-quality standards refer mostly to the concentration of mass emission of various types of particulates, sulfur dioxide, and oxides of nitrogen and in some cases volatile organic compounds and other substances.

The Bangladesh standards in general are less stringent compared to the developed countries. This is in view to promote and encourage industrialization in the country. The Bangladesh standards are not for any specific period. There is no provision for partial compliance too.

Standards for water, ambient air, noise, etc. are shown in Table.

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#### 3.4.9 THE GROUND WATER MANAGEMENT ACT, 2018

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The Ground Water Management Act, 2018 has repealed the previous Ground Water Management Ordinance, 1985. This Act is to manage the groundwater resources for agricultural production. This document describes the effects of the law that are inconsistent with the ordinance, Upazila irrigation committee, license for tube well and existing tube well, suspension and revocation of license, cancellation of license, supply of tube well by corporation, power to make rules and power to exempt.

But this Act has no provision related to civil society participation. The Act does not address industrial, commercial and other abstraction, protection of groundwater (e.g., recharge,

conjunctive use of surface and groundwater, rainwater harvesting, long term planning, punishment of water mining, etc.), integrated use of ground and surface water, absence of central monitoring/regulation mechanism, safe and sustainable abstraction of groundwater monitoring of quantity and quality of groundwater, water pollution, and water safety issues.

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#### 3.4.10 WATER SUPPLY AND SEWERAGE AUTHORITY ACT, 1996

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Water Supply and Sewerage Authority Act, 1996 was enacted to develop water supply and sanitation systems and to deliver water supply, sewerage, and stormwater drainage services. It provides for autonomous corporate management structures of Water Supply and Sewerage Authority (WASAs) which are answerable to their respective Boards of Directors representing a range of stakeholders. No person can abstract, treat, pump, preserve or supply of water or construct sewerage, pumping, and treatment plant within its jurisdiction. But the authority is not at all concerned about the industrial effluents. The matter of ensuring water quality has been neglected in this act. There is no provision for monitoring the water table, collecting data, maintaining databases, and long-term planning for sustainable use and management of water resources.

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#### 3.4.11 NATIONAL ENERGY POLICY 1995

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The National Energy Policy (1995) addresses both energy conservation and environmental issues. The National Energy policy suggests the utilization of energy for sustainable economic growth, supply to different zones of the country, development of indigenous energy sources and ensuring environmentally sound and sustainable energy development programs causing minimum damage to the environment.

The Environment Policy and the Energy Policy have seven recommendations; three of these are relevant to the proposed project:

- Environmental Impact Assessment should be made mandatory and should constitute an integral part of any new energy development project.
- Use of economically viable environment-friendly technology is to be promoted.
- Popular awareness to be promoted regarding environmental conservation.

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#### 3.4.12 SOLID WASTE MANAGEMENT REGULATIONS, 2021

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The **Solid Waste Management Regulations 2021** were published in Bangladesh on December 23, 2021, under the Bangladesh Environmental Protection Act, 1995. The Regulations define the responsibilities of businesses involved in solid waste management and impose collection, recycling, and disposal obligations according to **Extended Producer Responsibility (EPR)** on manufacturers of non-biodegradable products such as glass, plastic, and bottles. The Regulations also include provisions for the treatment of solid waste such as composting and energy recovery.

The main provisions of the Regulations are as follows.

- When recovering resources from waste, the principles of management that consider the waste hierarchy, such as the 3Rs, segregation, and reduction, must be followed at all stages from waste generation to final disposal.
- Responsibilities of waste generators, consumers, and users:
  - a) Dispose of waste in accordance with the regulations of authorities including local government.
  - b) Dispose of waste separately.
  - c) Do not dump, store, or burn waste outdoors.
- Responsibilities of manufacturers (\*not defined) and importers of products
  - Collect non-biodegradable products such as glass, plastic, polyethylene, multi-layered packaging, bottles, and cans from consumers and recycle or dispose of them if appropriate.
  - a) Determine work plans and implementation procedures for recycling and disposal.
  - b) Ensure that EPR is properly implemented.
  - c) Submit an annual report to the Department of Environment (DOE) on the amount of plastic recycled.
- Raise public awareness of proper waste management.

Any violation of the above provisions shall be subject to imprisonment for not more than two years or a fine not exceeding 200,000 taka (approximately 270,000 yen), or both. The Regulations also include provisions for the treatment of solid waste such as composting and energy recovery.

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#### 3.4.13 HAZARDOUS WASTE (E-WASTE) MANAGEMENT RULES, 2021

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Bangladesh's Department of Environment (DOE) published the Hazardous Waste (e-waste) Management Rules, 2021 under the Bangladesh Environmental Protection Act, 1995. The E-waste rule covers the products listed in the Schedule (home appliances, monitoring and control equipment, medical equipment, automatic machines, IT and communication equipment), and establishes obligations for manufacturers, assemblers, collectors, sellers, and consumers of the products. The rule also sets provisions to limit the use of the 10 substances covered by the EU RoHS Directive. This regulation entered in force upon publication.

The main provisions of this regulation are as follows.

- Manufacturers, traders, sellers, transporters, repairers, collection centers, recyclers, dismantlers, etc. of the subject products are required to register with a prescribed form to the DOE. When applying for registration, they shall also submit WEEE management plan.
- Registered manufacturers, recyclers, etc. shall obtain environmental clearance in accordance with the Bangladesh Environmental Protection Rules, 1997.
- Manufacturers have to establish individual or joint collection centers and set aside funds for the management of WEEE.
- For fluorescent lamps and mercury incandescent lamps, if they cannot be recycled, they need to be handed over to collection centers for storage and disposal.
- Manufacturers, importers, etc. shall meet the collection targets for WEEE as specified in the Schedule (10% in the first year of the implementation, 20% in the second year, 30% in the third year, 40% in the 4th year, and 50% in the fifth year and thereafter).

- In order to facilitate the proper management of WEEE, the name, address and contact information of the trader or seller as well as the information on the registered collection center shall be displayed on the product or on the product label, or this information shall be provided to consumers or large consumers.
- Traders, sellers and collectors of WEEE shall receive them from consumers at designated points and transport them to collection centers.

In case of violation of the provisions of these rules, the offender shall be liable to imprisonment for a maximum period of two years or to a fine of up to two hundred thousand taka, or to both, in accordance with Section 15(1) of the Bangladesh Environmental Protection Act, 1995. In case of repeat offenders, they shall be punished with imprisonment for a term ranging from two to ten years or a fine ranging from Taka 200,000 to Taka 1,000,000 or both.

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#### 3.4.14 NOISE POLLUTION CONTROL ACT, 2006

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Noise Pollution (Control) Rules 2006 were adopted under Section 20 of the Bangladesh Environment Conservation Act 1995 with a view to laying down the specific guidelines regarding noise pollution and the degree of allowable noise in different areas.

The rules categorize noise levels for five types of areas, those are silent areas, residential areas, mixed areas, commercial areas, and industrial areas. This Act also permitted a certain level of noise for these areas.

The permitted noise level for residential areas is 55 decibels at day and 45 decibels at night.

In industrial areas, the limit is 75 decibels at day and 70 decibels at night. 6 am and 9 pm is considered as daytime while the remaining hours are considered as night-time. However, these rules do not apply to religious events, Mosques or Temples.

The Rules also mentioned that no construction machines used to process and break down building materials (bricks, stones, etc.) shall be used within 500 meters of any residential areas and such types of machinery cannot be used between 7 pm and 7 am except without the permission of the concerned authorities.

Violation of these Rules is a punishable offense, with imprisonment up to 1 month and/or fine up to 5,000 BDT. For repeated offense, one may be imprisoned up to 6 months and/or fined up to 10,000 BDT. Loud horns and excessive honking is not yet punishable but it should be, it is one of the major cause of excessive noise.

This Act defined a set of regulations for controlled noise in some ways, but it is largely ignored by most of the people in our country, as we are seeing a gross violation of this Law everywhere in Bangladesh.

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#### 3.4.15 AIR POLLUTION CONTROL RULES, 2022

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The Ministry of Environment, Forest and Climate Change (MoEF) of Bangladesh released the draft Air Pollution Control Rules 2021, which aims to manage air pollution for environmental conservation and sustainable development on March 18, 2021 and is inviting public comments.

The draft Rules are regarded as subordinate regulations of the Bangladesh Environment Conservation Act, 1995 and its main provisions are as follows.

- The Rules stipulate environmental air quality standards (general standards), emission standards for vehicles, emission standards applicable to industries or projects, and odor standards.
- After the promulgation of the Rules, the Department of Environment (DoE) shall prepare a National Air Quality Management Plan that includes an organizational working framework and efficient management of indoor air quality. When preparing the National Air Quality Management Plan, the standards and methods specified in the Rules shall be followed.
- The DoE shall prepare and publish a list of industries, projects, and activities that are harmful to the environment and human health. For the industries and activities included in the list, the DoE shall establish emission standards and conditions for management as appropriate.
- In order to control air pollution from motor vehicles, the regulatory authority for motor vehicles shall comply with the standards and control methods specified in the Rules and follow the work procedures recommended in the National Air Quality Management Plan.
- The DoE may inspect the emissions of motor vehicles and restrict the movement of old motor vehicles that give off emissions exceeding the standards. The DoE may also regulate and prohibit certain engines in order to enforce the standards and control methods specified in the Rules.
- Local government organizations, construction management authorities, and other relevant organizations shall comply with the standards and control methods specified in the Rules and follow the work procedures recommended in the National Air Quality Management Plan.

The Rules also provide for the prevention of air pollution from hazardous waste, excessive emissions of air pollutants, air quality monitoring and warning, data management, establishment of a national executive committee for air pollution control, measures to prevent damage to ecosystems caused by air pollution, awards for contributions to air pollution control, and penalties for violations.

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#### 3.4.16 STANDING ORDERS ON DISASTER, 2010

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The Standing Orders on Disaster is designed to enhance capacity at all tiers of government administrative and social structures for coping with and recovering from disasters. The document contains guidelines for construction, management, maintenance, and use of the cyclone shelter center. Accordingly, to the guideline, geographical information system (GIS) technology will be applied at the planning stage to select the location of cyclone shelter considering habitation, communication facilities, and distance from the nearest cyclone center.

The advice of the concerned District Committee is to be obtained before the final decision. The cyclone shelters should have easier communication facilities so that in times of distress delay does not occur to go there. For this reason, the road communication from the cyclone shelters should not only link up with the city or main road but also with neighboring village areas. Provision of

emergency water, food and sanitation, and shelter space for livestock during the period should also be kept in view for future construction of shelters.

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#### 3.4.17 NATIONAL LAND-USE POLICY, 2001

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The Government of Bangladesh has adopted the national Land use Policy, 2001. The salient features of the policy objectives relevant to the proposed are as follows:

- To prevent the current tendency of gradual and consistent decrease of cultivable land for food production to meet the demand of explaining populations.
- To ensure that land use is in harmony with the natural environment,
- To use land resources in the best possible way and to play a supplementary role in controlling the consistent Increase In the number of landless people towards the elimination of poverty and the increase of employment,
- To protect natural forest areas, prevent river erosion and destruction of hills;
- To prevent land pollution, and
- To ensure the minimal use of land for construction of both government and non-government.

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#### 3.4.18 ACQUISITION AND REQUISITION OF IMMOVABLE PROPERTY ORDINANCE, 1982

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The 1894 Land Acquisition Act and the 1948 East Bengal (Emergency) Requisition of Property Act were replaced by the comprehensive 1982 acquisition and requisition of Immovable Property Ordinance (Ordinance □ of 1982). This 1982 Ordinance governs all cases of acquisition and requisition of immovable property by the Government for any public purpose or Public Interest.

Salient features of Acquisition and Requisition of Immovable Property Ordinance of 1982.

Matters to be cons/dared in determining compensation include,

- The market value of the property;
- Damage to standing crops or trees due to acquisition,
- Damage due to severance of acquired property from other property at the time of the actual taking of permission by concerned authorities;
- Damage due to lowering 01-profit to the property acquired between tile serving of acquisition notice and actual acquisition.

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#### 3.4.19 PROPERTY (EMERGENCY) ACQUISITION ACT, 1989

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Following the devastating floods of 1987 and 1988, the Government passed a new land acquisition law entitled Property Emergency Acquisition (Act ix of 1989). This is 1989 Act was promulgated to expedite land acquisition in an emergency for flood control purposes and to prevent river erosion. The 1989 Ordinance is only in special content. The 1989 Act was meant to remain in force for five years. There are no additional provisions in the 1989 Act to ensure faired payment of compensation. However, stricter time limits may be applied under the 1989 Act to enable the prompter payment of compensation monies.

Salient features of Acquisition and Reacquisition of Immovable Ordinance of 1982 the relevant points of the 1982 law are as follows:

- Property means only immovable property (land and buildings) and includes any right in such property.
- Owners include the occupiers.

Matters to be considered in determining compensation include;

- The market value of the property.
- Damages to standing crops or trees due to acquisition.
- Damages due to severance of acquired property from other property at the time of the actual taking of permission by concerned authorities.
- Damage due to other properties or earnings.
- Expensed for relocating of residence.
- Damage due to lowering of profit, the property to be acquired between the serving of acquisition notice and actual acquisition.

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#### 3.4.20 TOWN IMPROVEMENT ACT, 1953

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This act prevents the haphazard construction of buildings and the development of housing or industrial complexes or any similar activities in areas not specifically classified for that purpose. Master plans for different cities have been prepared, and specific regions have been identified for particular activities so that they cause minimum problems and maximum advantages.

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#### 3.4.21 ECA (ECOLOGICALLY CRITICALLY AREA) PROVISION

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An Ecologically Critical Area (ECA) is an environmental protection zone in Bangladesh. In 1995, specific areas in Bangladesh could be deemed Ecologically Critical Areas as a result of the Environmental Conservation Act. There is a multitude of areas that have been considered ECAs. Cox's Bazar is on the border of Bangladesh and Myanmar in the southeast corner of Bangladesh. The Teknaf Peninsula is 80 km of sandy beach and holds a variety of species as one of the longest beaches in the world. The Sonadia Islands are home to some of the last mangrove forests that house distinct species that can tolerate the high salinity of the mangrove forests in this area. The **Sundarbans** also contain mangrove forests and were named an ECA because they continue to suffer from over-exploitation and illegal urban development. St. Martin's Island is known for its coral algal that overwhelms its rocky reefs. The island is a refuge for globally threatened marine species. Finally, the Hakaluki Haor found in greater Sylhet is an ECA because it has an extensive amount of wetland habitats that support a wide variety of life.

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#### 3.4.22 INVESTMENT BOARD ACT, 1989

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Board of Investment, established under this act, is the principal private investment promotion and facilitation agency of Bangladesh which is responsible for the implementation of provisions of the above-said policy.

Under the provision of this act as per Schedule 11, All industries established in non-governmental sectors licensed by the Board shall be registered in the prescribed manner.

As per Schedule 15 of this act, any industrial undertaking licensed transgresses any provision of this Act or any rule made thereunder or breaks any condition relating to the license, the Board may, in such manner as may be prescribed, cancel the license of the industrial undertaking.

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#### 3.4.23 CONVENTION ON BIOLOGICAL DIVERSITY (CBD)

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Fifth National Report of Bangladesh (2015) to the CBD has been considered while preparing this IEE report. The coastal and marine ecosystems along with aquatic biodiversity (aquatic flora and fauna) have been emphasized in conducting this IEE report.

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#### 3.4.24 ENVIRONMENT COURT ACT, 2010

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In 2010 the Environment Court Act, 2010 has been passed and the Act of 2000 has been repealed. The present Act is aimed to establish one or more Environment Court/s in each district & to establish Environment Appellate Court. It defines the jurisdiction of the Environmental Court for trial of offence or for compensation under environmental law (ECA 1995). The enacted ECA and ECR did not appear to be suitable for traditional Court (Adalat) system in Bangladesh where huge number of cases needed to be disposed in quick time.

Guiding legislations: ECA1995, ECR1997, The Code of Civil Procedure 1908, The Code of Criminal Procedure, 1898, Penal Code 1860.

#### **Salient Features of the Environment Court Act**

- Environment court constitutes one Judge of the rank of Joint District Judge.
- Provides for the establishment of one or more Special Magistrate Court/s with the Magistrates of the first class or Metropolitan Magistrates in each District to deal with offences punishable with less than 5 (five) years imprisonment or 5 (five) lac taka as fine or both
- DG, DoE can file the case directly with the special magistrate's court or file a complaint with the police station under criminal procedure.
- DG, DoE or anyone directed by the court can enter any place for inspection, search, collect evidence or seizure.
- Investigation carried out by an Inspector or any officer subordinate to the DG, DoE. He will have the same powers as an OC of a police station.

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### 3.5 LOCAL GOVERNMENT LAWS

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Corporations shall make adequate arrangements for the removal, collection, and proper disposal of refuse (Section 77 of the Chittagong City Corporation (CCC) Ordinance, 1982; Dhaka City Corporation sec. 78; Rajshahi City Corporation sec. 77; Narayanganj City Corporation sec. 75; Barisal City Corporations sec. 85 and Sylhet City Corporation sec. 85).

- Local Government (Union Parishad) Act 2009 (Lowest level of local government). This Act has given Union Parishad a few tasks of water management in its 2nd schedule.
- Local Government (Pourashava) Act 2009 (District Level Local Government). By the Act Pourashava has been given some of the authority of water management. Article 11 of the 2nd schedule of the Act says about permission for personal source of water in Pourashava area. Discharge of water is discussed in Article 12 and provision of government water body is mentioned in Article 16.
- Local Government (City Corporation) Act 2009. City Corporation has been entrusted with some of the authority of managing water resources in the areas under its jurisdiction.
- Upazila Parishad Act 1998. Upazila Parishad is entitled under 2nd schedule of the Act to manage water resource to a small context.
- District Council (Zila Parishad) Act 2000. District Council has been authorized to manage water resources (water supply, discharge of water, conservation of water and water resources etc.) in the areas under its jurisdiction by this Act.

As local public representatives are included in the IWRM committees under Water Rules 2018, they should be more empowered by law.

### **3.6 PROCEDURE FOR OBTAINING SITE/ENVIRONMENTAL CLEARANCE**

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#### **3.6.1 DOE REQUIREMENT FOR INITIAL ENVIRONMENT EXAMINATION (IEE) REPORT**

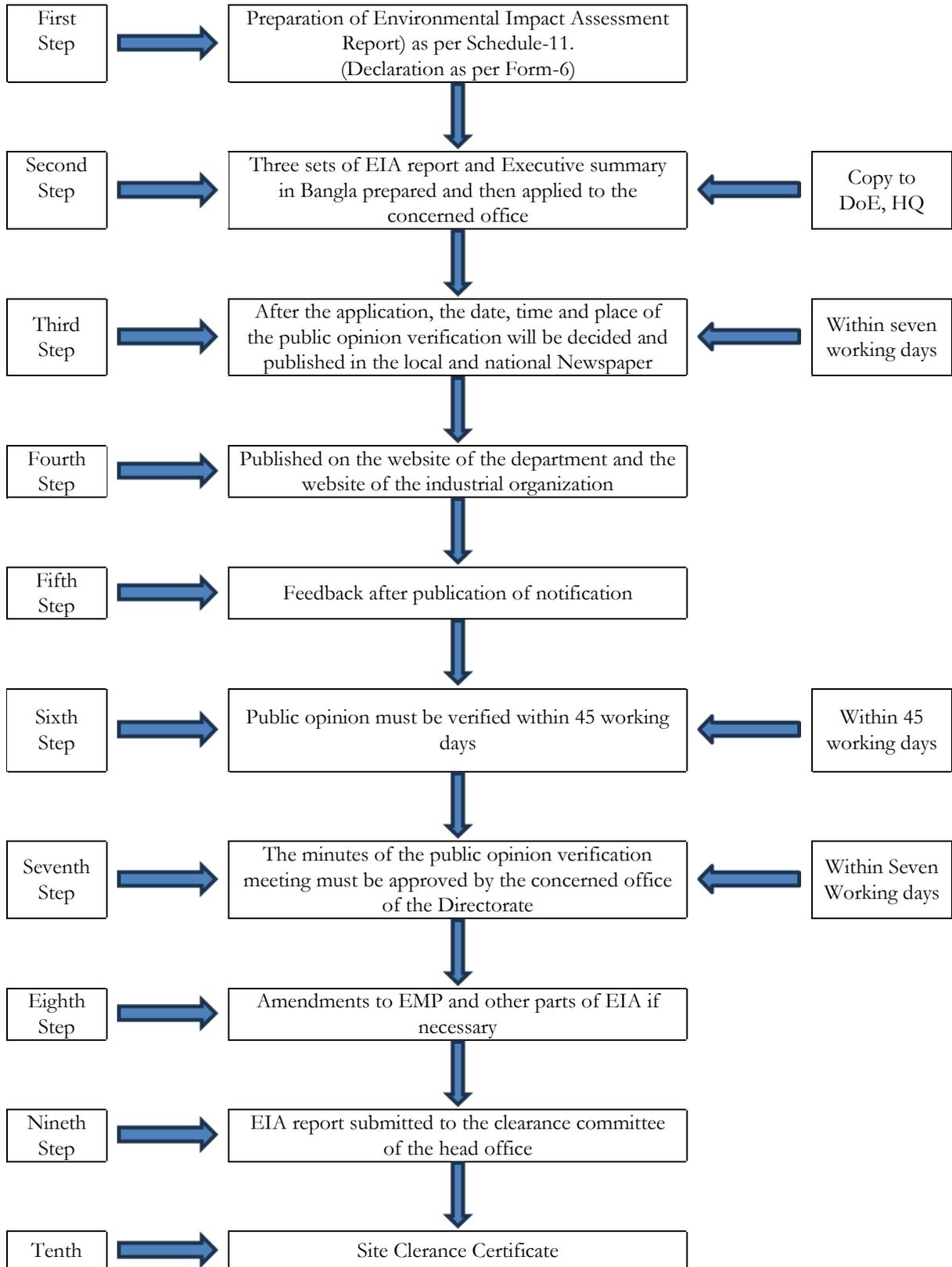
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All industries and projects in the red category have to conduct EIAs which help in understanding the potential extent of environmental changes and in finding mitigation measures by considering the available information of past experience or standard operating practices. The steps for conducting EIAs are:

- Collection of baseline information in respect of the project and the environmental setting of the project and its site.
- Setting of boundaries of an IEE by identifying the significant issues.
- Impact assessment suggesting mitigation measures, Environmental Management Plan (EMP) or alternative sites or other project modifications.
- In the event the IEE of the project or industry reveals that further investigation is to be carried out, the sponsors will have to carry out a detailed EIA.

#### **3.6.2 PROCEDURE**

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After completion of the EIA Report the project proponent should apply to the DOE in the prescribed format for site/ environmental clearance. The application for environmental clearance for the project classified in the Red Category should be accompanied by the following documents:

- Feasibility Study Report of the industry (project)
- IEE report
- An NOC (No Objection Certificate) from the local authorities concerned
- Pollution minimization plan, including an emergency plan for mitigation of adverse environmental impacts
- Outline of relocation plans (where applicable)
- Other information as deemed necessary

It is also mentioned in the Environment Conservation Rules that the Director General of the Department of Environment can issue environmental clearance directly without issuing any site clearance to any industry or project if he (the Director General) finds an appropriate reason for doing so. As the proposed Construction of the RMG project is in the red category, all necessary requirements mentioned above will be adopted for the project.

Under the condition specified in the Environmental Conservation Rules-2023, the DoE divisional authority must issue an environmental site clearance letter within 60 working days of applying or the refusal letter with appropriate reasons for such refusal. The clearance issued remains valid for one year and must be renewed 30 days before the expiry of the period.

Environmental Conservation Rules-2023 ensures the right of any aggrieved party to appeal against the notice order or decision to the appellate authority. The appeal should be made to the appellate authority with clear justification and the attested copy of the DoE office against which the appeal is to be made. The focus of the ECR, 2023 lies with the classification of industries into three main categories, i.e., Green, Orange, and Red, based on their pollution potential. Documents required by respective DoE divisions for different categories are as follows:

#### **For Green Category:**

- General information about the industrial unit or project;
- The exact description of the raw materials and the manufactured product;
- No objection Certificate from the local authority.

Orange listed industries fall under two sub-categories:

#### **For Yellow Category:**

- General information about the industrial unit or project;
- The exact description of raw materials and manufactured products;
- No objection Certificate from the local authority;
- Process flow diagram;
- Layout Plan (showing location of Effluent Treatment Plant);

- Effluent discharge arrangement;
- Outline of the plan for relocation and rehabilitation (if applicable)
- Other necessary information (if applicable).

**For Orange Category:**

- Report on the feasibility of the industrial unit or project (applicable only to the proposed industrial unit or project)
- Report on the Initial Environmental Examination (IEE) of the industrial unit or project, and also the process flow diagram, Layout Plan (showing the location of the Neutralization Treatment Plant), design of the Neutralization Treatment Plant (NTP) of the unit or project (these are applicable only for a proposed industrial unit or project);
- Report on the Environmental Management Plan (EMP) for the industrial unit or project, and also the Process Flow Diagram, Layout Plan (showing the location of the Neutralization Treatment Plant), design of the Neutralization Treatment Plant, and information about the effectiveness of NTP of the unit or project, (these are applicable only for an existing industrial unit or project);
- No objection certificate from the local authority;
- Emergency plan relating to adverse environmental impact and plan for mitigation of the effect of pollution;
- Outline of the relocation rehabilitation plan (where applicable);
- Other necessary information (where applicable).

**For Red Category:**

- Report on the feasibility of the industrial unit or project (applicable only for proposed industrial unit or project);
- Report on the Environmental Impact Assessment (EIA) relation to the industrial unit or project, and also the terms of reference for the Environmental Impact Assessment of the unit or the project and its Process Flow Diagram; or Environmental impact Assessment report prepared based on terms of reference previously approved by the Department of Environment, along with the Layout Plan (showing the location of Neutralization Treatment Plant), Process Flow Diagram, design and schedule of the Neutralization Treatment Plant of the unit or project, (these are applicable only for a proposed industrial unit or project);
- Report on the Environmental Management Plan (EMP) for the industrial unit or project, and also the Process Flow Diagram, layout Plan (showing the location of Neutralization Treatment Plant), design, and information about the effectiveness of the Neutralization Treatment Plant of the unit or project (these are applicable only for an existing industrial unit or project);
- No objection Certificate of the local authority;
- Other necessary information

The process of getting Environmental Clearance is given in the following figure-

### 3.7 INTERNATIONAL AND NATIONAL ENVIRONMENTAL STANDARDS/GUIDELINES

Bangladesh Environmental standards and guidelines relevant to the construction and operation of the project cover the following issues:

- Water Quality
- Atmospheric emissions and ambient air quality;
- Liquid effluent discharges
- Noise emissions and ambient noise levels.

#### 3.7.1 WATER QUALITY

TABLE 3-1 STANDARD FOR INLAND SURFACE WATER

Best practice-based classification	Parameter											
	PH	DO mg/l	BO D mg/l	NO <sub>3</sub> -N mg/l	NH <sub>4</sub> -N mg/l	PO <sub>4</sub> -P mg/l	Total Cr mg/l	Pb mg/l	Hg mg/l	Total Coliform Number/100 ml	TDS mg/l	CO D mg/l
1. Source of drinking water for supply only after disinfecting	6.5 - 8.5	≥6	≤2	7	0.1	0.1	0.02	0.03	0.001	≤100	100	10
2. Water usable for recreational activity	6.5 - 8.5	≥5	≤3	7	0.3	0.5	0.2	0.05	0.001	≤50	100	10
3. Source of drinking water for supply after conventional treatment	6.5 - 8.5	≥5	≤3	7	0.3	0.5	0.02	0.03	0.001	≤5000	100	25

4	Water usable by fisheries	6.5 - 8.5	≥5	≤6	7	0.3	0.5	0.05	0.1	0.004	≤5000	1000	50
5	Water usable by various process and cooling industries	6.5 - 8.5	≥1	12	-	2.7	-	0.1	0.1	0.05	-	1000	100
6	Water usable for irrigation	6.5 - 8.5	-	≤12	5	1.5	2.0	0.1	0.1	0.002	≤50000	1000	100

Source: Schedule 2, Environmental Conservation Rules-2023, Inland surface water parameter

**Notes:**

1. Electrical conductivity for irrigation water –2250 μmhoms/cm (at a temperature of 25°C); Sodium less than 26%; boron less than 0.2%.

TABLE 3-2 STANDARDS FOR DRINKING WATER

S.N.	Parameter	Unit	Standards
1.	Fecal Coliform	CFU/100 ml	0
2.	Total Coliform	”	0
3.	Free Residual Chlorine	mg/l	0.20
4.	Nitrate (NO <sub>3</sub> )	mg/l	45
5.	Arsenic (As)	mg/l	0.05
6.	Turbidity	NTU	5
7.	Aluminum	mg/l	0.20
8.	Ammonia (NH <sub>3</sub> )	”	1.50
9.	Barium (Ba)	”	0.70
10.	Benzene (C <sub>6</sub> H <sub>6</sub> )	”	0.01
11.	Boron (B)	”	1.0
12.	Cadmium (Cd)	”	0.003
13.	Calcium	”	75
14.	Chloride	”	250*
15.	Carbon Tetra-chloride (CCL <sub>4</sub> )	mg/l	0.005
16.	1,1 Dichloro Ethylene (1,1 C <sub>2</sub> H <sub>4</sub> Cl <sub>2</sub> )	”	0.03
17.	1,2 Dichloro Ethylene (1,2 C <sub>2</sub> H <sub>4</sub> Cl <sub>2</sub> )	”	0.03
18.	Tetrachloro Ethylene (C <sub>2</sub> H <sub>4</sub> Cl <sub>2</sub> )	”	0.04
19.	Trichloro Ethylene (C <sub>2</sub> H <sub>3</sub> Cl <sub>3</sub> )	”	0.02
20.	Pentachlorophenol	mg/l	0.09
21.	2,4,6 trichlorophenol	”	0.20
22.	Chloroform	”	0.09
23.	Total Chromium (Total Cr)	”	0.05

24.	Color	Hazen Unit	15
25.	Copper	mg/l	1.5
26.	Cyanide (CN)	”	0.05
27.	Fluoride	”	1.0
28.	Hardness (as CaCO <sub>3</sub> )	”	500
29.	Iron (Fe)	”	0.3-1.0
30.	Total Kjeldhl Nitrogen	”	1.0
31.	Lead (Pb)	”	0.01
32.	Magnesium (Mg)	”	30-35
33.	Manganese (Mn)	”	0.4
34.	Mercury (Hg)	”	0.001
35.	Nickel (Ni)	”	0.05
36.	Nitrite (NO <sub>2</sub> <sup>-</sup> )	”	1.0
37.	Odor	-	Odorless
38.	Oil and grease	mg/l	0.01
39.	p <sup>H</sup>	-	6.5-8.5
40.	Phenolic compounds	mg/l	0.002
41.	Potassium (K)	”	12
42.	Radioactive materials (gross alpha activity)	Bq/l	0.1
43.	Radioactive materials (gross beta activity)	”	1.0
44.	Selenium (Se)	mg/l	0.01
45.	Silver	”	0.02
46.	Sodium (Na)	”	200
47.	Suspended Solid (SS)	”	10
48.	Sulfide as H <sub>2</sub> S	”	0.05
49.	Sulfate (SO <sub>4</sub> <sup>-2</sup> )	”	250
50.	Total dissolved solids (TDS)	”	1000
51.	Temperature	°C	20-30
52.	Tin (Sn)	mg/l	2.0
53.	Zinc (Zn)	mg/l	5.0
54.	Aldrin/Dieldrin	µg/l	0.03
55.	Anionic detergent	mg/l	0.2

Source: Environmental Conservation Rule-2023, Schedule-2, Standards for drinking water

**Note**

\*For estuarine area 1000 mg/l

TABLE 3-3 STANDARD FOR SEWAGE DISCHARGE

Parameter	Unit	Standard Limit
Temperature	Degree Centigrade	30
pH	-	6-9
BOD <sub>5</sub> at 20°C	mg/l	30
COD	mg/l	125
Suspended Solids (SS)	mg/l	100

Oil & Grease	mg/l	10
Nitrate (NO <sub>3</sub> )	mg/l	50
Phosphate (PO <sub>4</sub> )	mg/l	15
Total Coliform	Number/100 ml	1000

Source: Environmental Conservation Rule-2023, Schedule-6, Standards for sewage discharge

Note: 1. The limit shall be applicable to discharges into surface and inland water bodies.

2. Sewage shall be chlorinated before final discharge.

### 3.7.2 AMBIENT AIR QUALITY

TABLE 3-4 STANDARDS FOR AIR

S.N.	Categories of Area	Suspended Particulate Matters (SPM)	Sulphur-dioxide (SO <sub>2</sub> )	Carbon Monoxide (CO)	Oxides of Nitrogen (NO <sub>x</sub> )
		µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>	µg/m <sup>3</sup>
a.	Industrial and mixed	500	120	5000	100
b.	Commercial and mixed	400	100	5000	100
c.	Residential and rural	200	80	2000	80
d.	Sensitive	100	30	1000	30

Source: Schedule 2, Environmental Conservation Rules, 1997

**Notes:**

1. At national level, sensitive area includes monuments, health center, hospital, archeological site, educational institution, and government designated areas (if any).
2. Industrial units located in areas not designated as industrial areas shall not discharge pollutants which may contribute to exceeding the standard for air surrounding the areas specified at Sl. nos. c and d above.

Suspended Particulate Matter means airborne particles of a diameter of 10 micron or less.

TABLE 3-5 STANDARD FOR ODOR

Sl. No.	Parameter	Unit	Value
1	Acetaldehyde	Ppm	0.5-5
2	Hydrogen sulfide	Ppm	0.02-0.20
3	Methyl disulfide	Ppm	0.009-0.10
4	Methyl mercapted	Ppm	0.02-0.20
5	Methyl sulfide	Ppm	0.01-0.20
6	Styrene	Ppm	0.4-2
7	Tri-methyl-amine	Ppm	0.005-0.07
8	Ammonia	Ppm	1-5

Source: Environmental Conservation Rule-1997, Schedule-8, Standards for odor.

TABLE 3-6 STANDARD FOR EMISSION FROM MOTOR VEHICLES

Parameter	Unit	Standard Limit
<b>Black Smoke</b>	Hartridge Smoke Unit (HSU)	<b>65</b>
<b>CO</b>	gm/km	<b>24</b>
	percent area	<b>04</b>
<b>Hydrocarbon</b>	gm/km	<b>02</b>
	ppm	<b>180</b>
<b>NO<sub>x</sub></b>	<b>gm/km</b>	<b>02</b>
	<b>ppm</b>	<b>600</b>

Source: Environmental Conservation Rule-1997, Schedule-6, Standards for emission from motor vehicles \*As measured at two thirds of maximum rotating speed.

TABLE 3-7 APPROVED AIR QUALITY INDEX (AQI) FOR BANGLADESH

Air Quality index (AQI) Range	Category		Color
	In English	In Bangla	
0-50	Good	Bhalo	Green
51-100	Moderate	-	Yellow Green
101-150	Caution	-	Yellow
151-200	Unhealthy	Ashasthykar	Orange
201-300	Very Unhealthy	Khub Ashasthykar	Red
301-500	Extremely Unhealthy	Ottanta Ashasthykar	Purple

Source: ECR, 1997

### 3.7.3 AMBIENT NOISE STANDARDS

The MoEF under the provisions of ECR, 1997 is responsible for laying down ambient noise standards. Noise Pollution (Control) Rules, 2006 were laid down by the Ministry through a Gazette notification dated September 7, 2006. Ambient noise standards established as per the provisions Rule 5(2) of the aforementioned Rules have been furnished in the following table.

TABLE 3-8 STANDARDS FOR SOUND

SN	Category for sound	Standards determined (dBA)	
		Day	Night
<b>a.</b>	Silent Zones (Sensitive areas such as parks, school, hospitals and mosques)	45	35
<b>b.</b>	Residential areas	50	40
<b>c.</b>	Mixed areas (mainly residential area, and also simultaneously used for commercial and industrial purposes)	60	50
<b>d.</b>	Commercial areas	70	60

e.	Industrial areas	75	70
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Source: Schedule 4, Environmental Conservation Rules, 1997

**Notes:** *The time from 6 a.m. to 9 p.m. is counted as daytime.*

- *The time from 9 p.m. to 6 a.m. is counted as night time.*
- *Area up to a radius of 100 meters around hospitals or educational institutions or special institutions/ establishments identified/ to be identified by the Government is designated as Silent Zones where use of horns of vehicles or other audio signals, and loudspeakers are prohibited.*

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## CHAPTER 4 PROJECT DESCRIPTION

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### 4.1 GENERAL INFORMATION

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**MIDLAND KNITWEAR LIMITED** will be incorporated in Bangladesh as a limited company with a vision to establish itself as one of the most progressive **Knitting, Dyeing, and Finishing** companies in the sub-continent. Midland Knitwear Limited is Mainly Fabrics Dyeing, Finishing, and Knitting industry. With a long-term focus on developing and establishing a sustainable business footprint, **MIDLAND KNITWEAR LIMITED** will strive towards technologically advanced services for numerous customers in Bangladesh and beyond. The company aspires to engage in a long-term and sustainable business vision led by a talented team of leaders and professionals in the sector. With a continuous focus on quality improvement and value addition, adoption of top-of-the-line technology, commitment towards maintaining a safe and healthy workplace for the workers, and strict adherence to buyer requirements, this company will become one of the most preferred RMG service providers in the future.

The **MIDLAND KNITWEAR LIMITED** intends to build a dyeing and knitting at **52/03, Block- E, Shantinagar, Shiddhirganj, Narayanganj City Corporation, Narayanganj**. Geographically the project is located between **23°39'01.2"N latitude and 90°30'12.5"E longitude**. The total land area of the proposed project will be **306 decimals**. The project operated in 2 buildings and 4 floors.

**M. Samsuzzaman, Managing Director** of **Midland Knitwear Limited** has proposed to set up this project. According to the ECR 2023, the project is categorized as **GREEN** as per schedule 1 and serial number 53, therefore the project requires an EIA study for its Site Clearance Certificate. The proponent of Midland Knitwear Limited has requested '**Global Environmental & Textile Technological Services (GETTS)**' to prepare an EIA report on this project as per the DoE guideline. Accordingly, this EIA report has been prepared.

### 4.2 OBJECTIVES OF THE PROJECT

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The main objective of the proposed project is

- Construct best quality Accessories and provide after-sales services.
- Produce expeditions and memories that would satisfy every single customer.

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#### 4.2.1 PROJECT OUTCOME

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The possible project outcomes are-

- ✦ The project will enhance the garment accessories sector in Bangladesh.
- ✦ Provide job opportunities to the indigenous people.
- ✦ The project will help improve the socio-economic condition of the Project site

### 4.3 INVESTMENT IN THE PROJECT

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Investment sources

#### 4.4 BASIC INFORMATION

The basic data of **Midland Knitwear Limited** is furnished in Table 4.1.

TABLE 4-1 BASIC INFORMATION OF MIDLAND KNITWEAR LIMITED

Name of the Project	<b>MIDLAND KNITWEAR LIMITED</b>
Type of Company	Private Company Limited by Shares
Project Proponent	M. Shamsuzzaman
Designation	Managing Director
Location	52/03, Block- E, Shantinagar, Shiddhirganj, Narayanganj City Corporation, Narayanganj.
Coordinate of the project	<b>23°46'22.2"N latitude and 90°33'31.5"E longitudes</b>
Project area	According to the fire service license, the factory area is 1 26 800 square feet. The total land area in 306 Decimals as per NOC
Final Products	Fabrics knitting, Dyeing Finishing.
Production Capacity	<ul style="list-style-type: none"> <li>❖ Dyeing - 40 Ton per day</li> <li>❖ Fabrics - 4.6 million kg/ year</li> <li>❖ Polo Shirt - 94.4 million pcs per year</li> </ul>
Sales	Foreign 100%
Locally procured raw materials	Furniture & fittings, consumables (welding's rod, Oxygen, LPG, electricity), steel pipes, Steels angles
Manpower	More than 300 Persons, both male and female
Power Requirement	The main power connection line is BREB. 2 MW
Alternative Source	Generator and Solar Power
Source of Water	Deep tube-well
Wastewater Treatment, ETP	The project produces a considerable amount of industrial waste from the dyeing section. The wastewater will be treated with 100 m <sup>3</sup> per hour ETP. <b>Drawing, design attached with annexure.</b>
Estimated Solid waste generation	All the solid waste is sold to a 3 <sup>rd</sup> party.
Safety and Emergency Preparedness	Fire extinguishers, Fire alarm systems, Fire pumps, Fire escape route, Fire hydrant and hose reel, Smoke detector, Sound screening mechanism, and Ramp for handicapped people

#### 4.5 LOCATION OF THE PROJECT

The **MIDLAND KNITWEAR LIMITED** intend to build a shipyard at **52/03, Block- E, Shantinagar, Shidhirganj, Narayanganj City Corporation, Narayanganj**. The said project is very close to Dhaka- Sylhet Highway, on the opposite side of Robintex Group. The project area has sorts of communication facilities. It is accessible through the Dhaka- Sylhet Road.

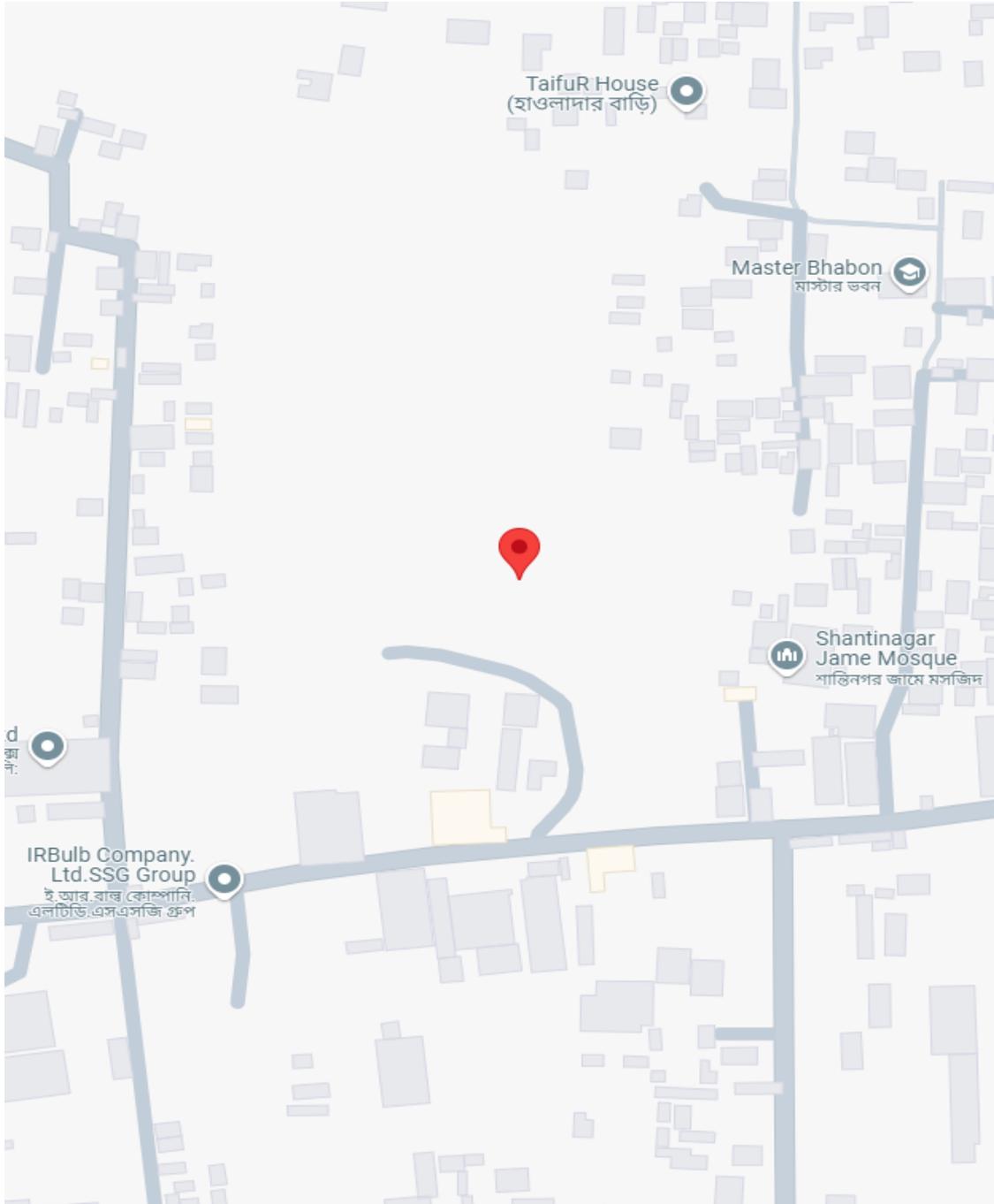


FIGURE 4-1 LOCATION MAP FROM GOOGLE MAP 2D

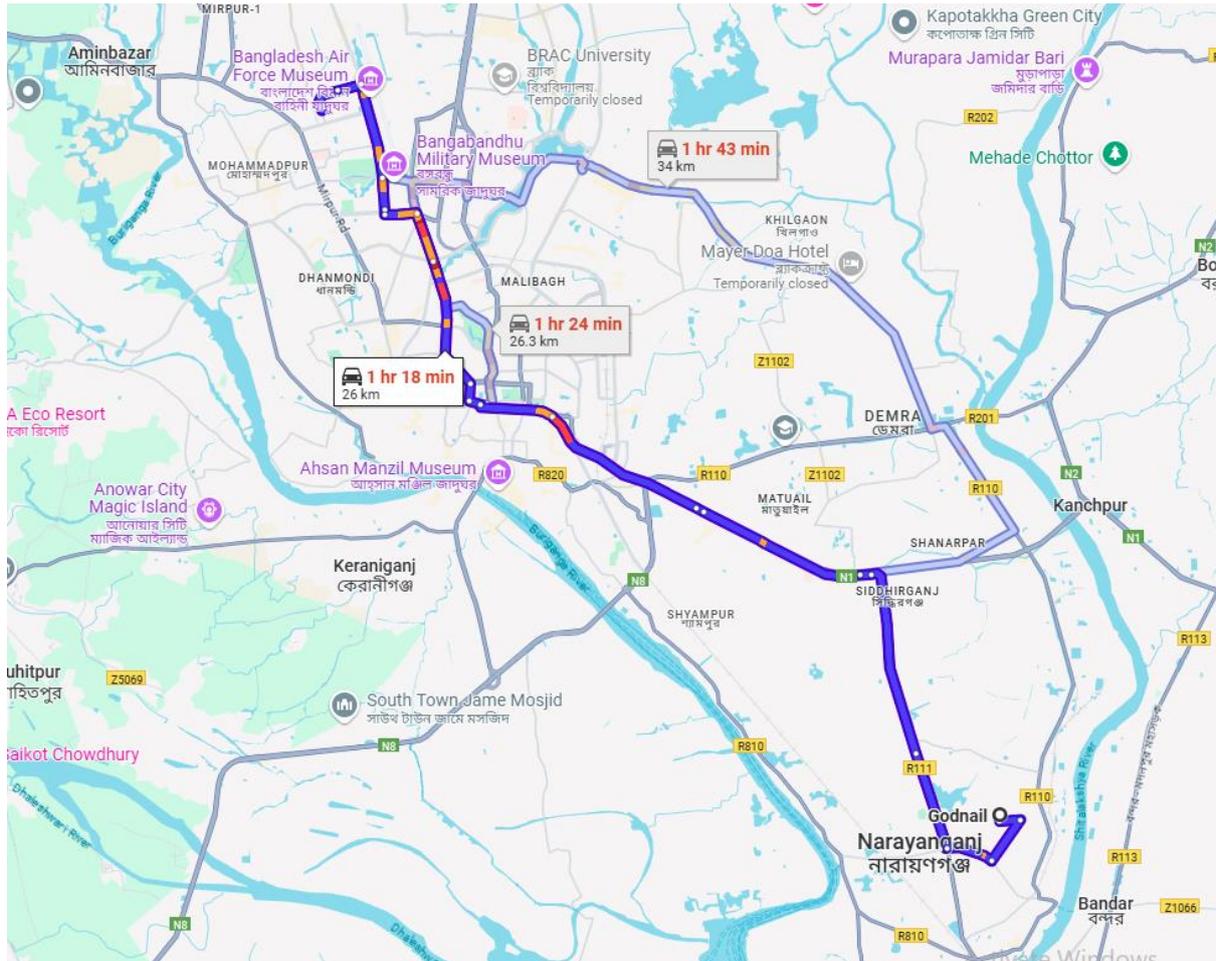


FIGURE 4-2 LOCATION MAP 3D

**4.5.1 DIRECTION TO THE PROJECT FROM DEPARTMENT OF ENVIRONMENT.**

- Paribesh Bhaban, E/16 W Agargaon, Dhaka 1207
- Take Begum Rokeya Avenue, Bijoy Sarani and Bijoy Sarani - Tejgaon Link Rd to Moghbazar Rd/Shahed Tajuddin Ahmed Ave = 14 min (4.8 km)
- Continue on Moghbazar Rd/Shahed Tajuddin Ahmed Ave. Take Mouchak Moghbazar Flyover and Moghbazar Rd/Shahed Captain Monsur Ali Sharani to Nat'l Eidgah St = 9 min (4.1 km)
- Take College Rd and Fulbaria Rd to Dhaka - Sylhet Hwy = 5 min (1.6 km)
- Take Mayor Mohammad Hanif Flyover to Dhaka - Demra Hwy/R110. Exit from Mayor Mohammad Hanif Flyover = 6 min (3.5 km)
- Continue on Dhaka - Demra Hwy/R110 to destination



FIGURE 4-3 PHYSICAL FEATURES AND TOPOGRAPHIC SURVEY MAP

#### **4.6 SURROUNDING AND ACCESSIBILITY**

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**MIDLAND KNITWEAR LIMITED** will be located at **52/03, Block- E, Shantinagar, Shiddhirganj, Narayanganj City Corporation, Narayanganj**. The site is surrounded by vacant land, Industrial area and road.

- **North:** To the north of the proposed project site, around 1.6 km vacant area, then local residence and small local factory.
- **South:** To the south of the proposed project site, around 20 feet shahebbari road-2, then Abloom Design composite ltd. And IR bulb company, Abdul Aziz textile group then Local factory and few residences.
- **East:** to the east side of the project, orient industry, Local residence and vacant space then factory
- **West:** To the west of the proposed project site, To the east of the proposed project site, vacant plot and local commercial space then Eurotex knitwear limited then city corporation Drane then local residence



**North Side**



**South Side**



**East Side (existing road)**



**West Side**

FIGURE 4-4 SURROUNDINGS OF THE PROJECT

#### **4.7 PROJECT SITE IMAGERY**

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visual representation of the project site is presented below-

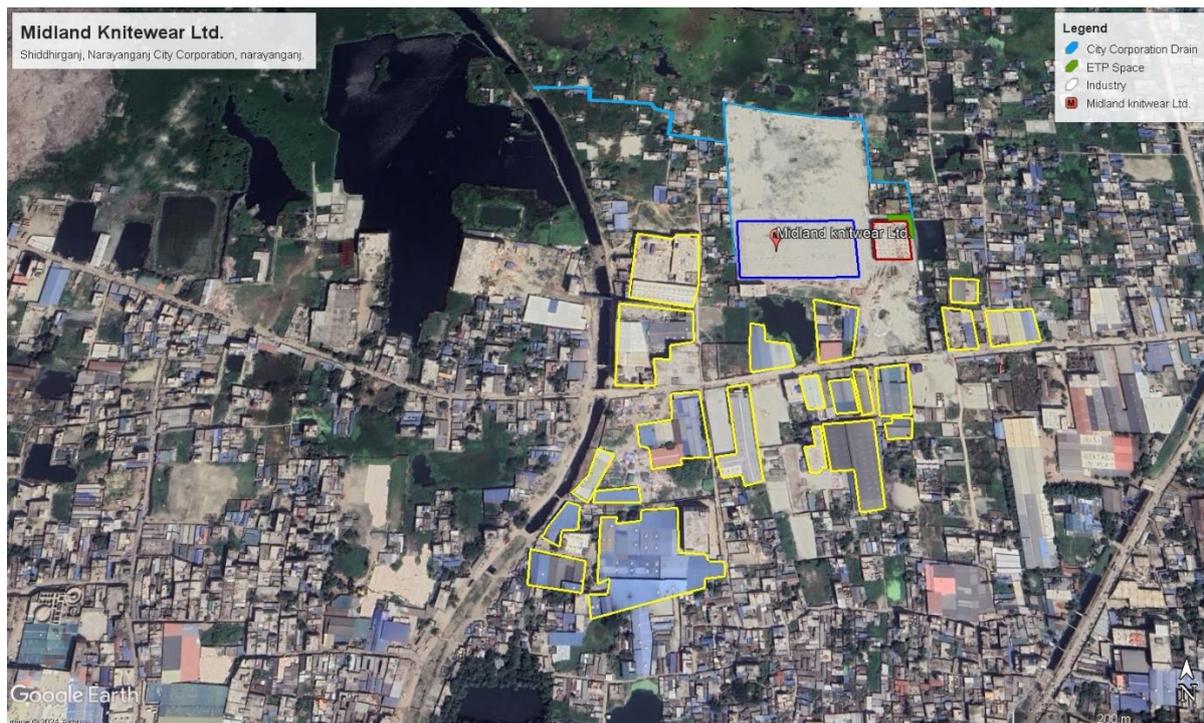


FIGURE 4-5 INSIDE ROAD OF THE PROJECT

#### **4.8 LAND AREA**

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**MIDLAND KNITWEAR LIMITED.** has been proposed to be located at **52/03, Block- E, Shantinagar, Shidhirganj, Narayanganj City Corporation, Narayanganj** Geographically the project is located between **22°09'41" N latitude and 92°12'55" E longitudes.** Total Factory Area of the project is 12000 sq. ft.



## 4.9 REQUIREMENT OF THE PROJECT

### 4.9.1 HUMAN RESOURCE

During Operation phase a approx. 300-350 skilled and semi-skilled human resources will be needed. Local people will be prioritized for job opportunity upon qualification.

### 4.9.2 MATERIALS TO BE REQUIRED

Locally procured raw materials	Furniture & fittings, consumables (welding's rod, Oxygen, LPG, electricity), steel pipes, Steels angles
Imported raw materials	Machineries, Operational fittings etc.

The materials used for the construction of project are Wood, Ply board, base material, cement, admixture, coarse aggregate, fine aggregate, reinforcement etc. These construction materials will not be placed in the public place. The project proponent will manage the site for the stockpiling of construction materials within its own land and the stockpiling materials will be placed after covering them to avoid the pollution in the site.

### 4.9.3 POWER SUPPLY

On this case of asserting the requirements of raw materials for a

**4.9.4 WATER REQUIREMENT**

The source of water of the project is its deep tube well. This water is used for total project, daily purposes, drinking, and sanitation. In production purpose no water will be used.

Particulars	Calculation of water required	Unit/day
Drinking Purpose	Total project manpower = 300 Total Drinking Water requirement = $300 \times 2 = 600$ liters/day	<b>0.3 m<sup>3</sup>/day</b>
Sanitary and purposes	1. Office Staff = 300 Persons. Water required = $300 \times 30$ liter/person = 9000 liter/day Total waste water = 30000 liter/day 10% adding as free board in basic design = $9000 + 900 = 9900$ liter/day = 10 m <sup>3</sup> per day.	<b>10 m<sup>3</sup>/day</b>
Dyeing Purpose	40-ton dyeing capacity. Per kg, dyeing needs 48 kg water as a 1:5 ration.	<b>1920 m<sup>3</sup>/day</b>
Road and Pavement watering, car washing	1000 liters/day	<b>1 m<sup>3</sup>/day</b>
<b>Total Water Requirement</b>		<b>1933 m<sup>3</sup>/day</b>

The project will maintain good sanitation with a clean, adequate number of toilet/bathroom services, soap, and hand washing, and maintain friendly structures. Wastewater Generation and Treatment

**4.10 DATE OF IMPLEMENTATION**

- The project will be running starting next year.

**4.11 DESCRIPTION OF THE PROJECT ACTIVITIES**

**1. \*\*Yarn Preparation\*\***

- └─ Yarn Selection
- └─ Yarn Cleaning

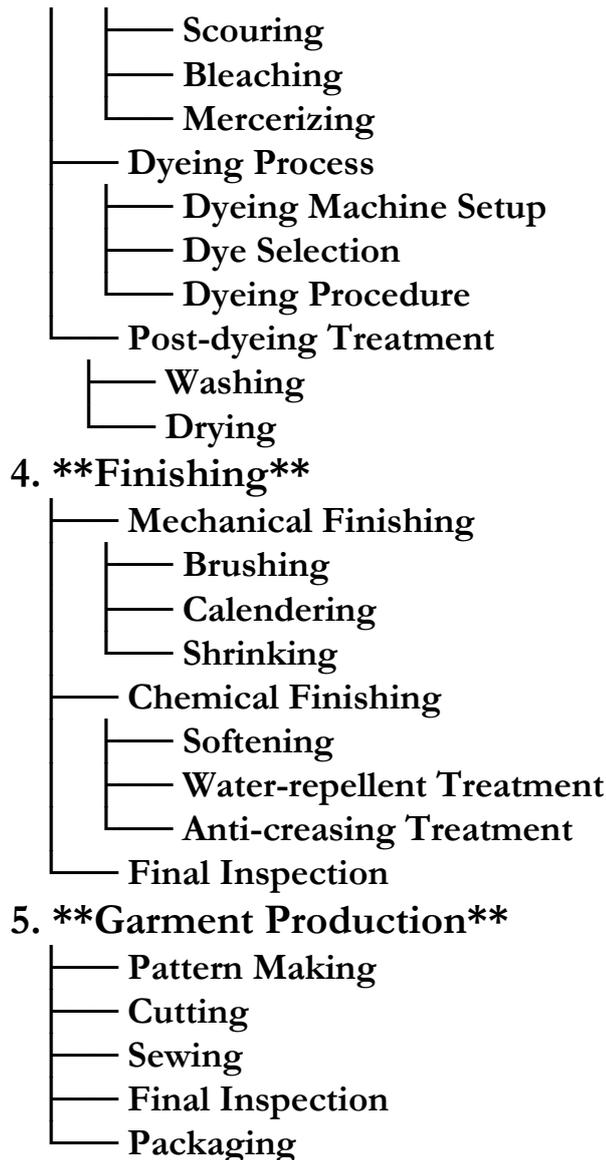
**2. \*\*Knitting\*\***

- └─ Knitting Process
  - └─ Circular Knitting
  - └─ Flat Knitting
- └─ Inspection of Knitted Fabrics

**3. \*\*Dyeing\*\***

- └─ Pre-treatment (if necessary)






---

#### 4.11.1 PRODUCTION IN DETAILS

---

The process flow diagram of each sector

- Yarn **Preparation:** Selecting and cleaning the yarn before it goes into the knitting process.
- Knitting: This involves knitting the yarn into the fabric using circular or flat knitting machines, followed by inspecting the knitted fabric for quality.
- Dyeing:
  - **Pre-treatment:** Preparing the fabric for dyeing, which may involve several processes, such as scouring, bleaching, or mercerizing.

- **Dyeing Process:** Setting up dyeing machines, selecting dyes, and carrying out the dyeing.
- **Post-dyeing Treatment:** Involves washing and drying the dyed fabric.

□ **Finishing:** Enhancing the fabric properties through mechanical and chemical methods, followed by a final inspection to ensure quality.

□ **Garment Production:** This includes making patterns, cutting fabric, sewing garments, inspecting the finished products, and packaging for distribution.

#### 4.11.2 WATER CALCULATION OF MIDLAND KNIT WEAR LIMITED.

Total Knit Dyeing 39 No's Machine.

Capacity of machine as follows

Capacity of Knit Dyeing Machine	Machine No's	80% Fabric Loading	Batch	Total Fabric Dyeing
1500 kg	2 No's	2400 kg	2.5	6000 kg
1250 kg	2 No's	2000 kg	2.5	5000 kg
1000 kg	4 No's	3200 kg	2.5	8000 kg
750 kg	4 No's	2400 kg	2.5	6000 kg
600 kg	5 No's	2400 kg	2.5	6000 kg
500 kg	4 No's	1600 kg	2.5	4000 kg
400 kg	3 No's	960 kg	2.5	2400 kg
250 kg	3 No's	600 kg	2.5	1500 kg
100 kg	2 No's	160 kg	2.5	400 kg
50+50+30+30+30+20+ 20+10+10 kg	10 No's	200 kg		500 kg
Total	39 No's Machine	15920 kg	2.5	39,800 kg
Total Fabrics Dyeing				39,800kg

Total production hours 24 hrs. and 8 hours for a batch

Total 2.5 batches completed in a day.

Total process steps and water consumption are 10 as follows.

1.0 Knit Dyeing 1250 kg Capacity Machine Water Calculation (Fabrics Loading-1000 kg/Machine)

TABLE 4-2 WATER CONSUMPTION RATION STEP BY STEP

1	Loading/Normal Wash (1:6)	→	6000 Liter
	↓		
2	Scouring& Bleaching (1:6)	→	6000 Liter
	↓		
3	Hot Wash (1:5)	→	5000 Liter
	↓		
4	Cold Wash (1:5)	→	5000 Liter
	↓		
5	Acid Cold Wash (1:5)	→	5000 Liter
	↓		
6	Color (1:4)	→	4000 Liter
	↓		
7	Cold Wash (1:5)	→	5000 Liter
	↓		
8	Hot Wash (1:4)	→	4000 Liter
	↓		
9	Acid Cold Wash (1:4)	→	4000 Liter
	↓		
10	Soft Wash (1:4)	→	4000 Liter
Total water			48000 Liter/1000kg fabric = 48 liter/1kg fabric

#### 4.11.3 BASIS OF THE PLANT DESIGN

##### SOURCE

The raw effluent shall be discharged to the proposed Physico Chemical & Biological effluent treatment plant for “**Midland Knit Wear Limited.**”

**QUANTITY**

The effluent to be treated shall be capacity - 2200 m<sup>3</sup>/day.

**CAPACITY OF THE EFFLUENT TREATMENT PLANT**

The effluent treatment plant has been designed based on the following:

1. Knit Cotton Fabrics Dyeing Printing & Finishing - 40,000 kg/day.

Water Required = 40000 X 48 liter/kg (Water Ratio 1:5).  
= 1920000liter/day  
= 1920 m<sup>3</sup>/day  
= 87.27 m<sup>3</sup>/hr.

10% Additional in design as a free board on actual outlet = 87.27 + 8.73 m<sup>3</sup>/hr.  
= 96 m<sup>3</sup>/hr.

Contaminated effluent is 100%

Less Contaminated effluent is 0%

Operated continuously for 22 hours a day

The flow rate of treatment envisaged is 100 m<sup>3</sup>/hr.

**INLET AND OUTLET EFFLUENT PARAMETERS (Knit Dyeing Printing & Finishing)**

Flow rate 100m <sup>3</sup> /hr	Inlet Parameters	Outlet Parameters
pH	8-12	6 – 9
BOD	450 - 500 mg/L	< 30 mg/L
COD	600 - 800 mg/L	< 200 mg/L
TSS	300 - 400 mg/L	<100 mg/L
COLOR		150
OIL & GREASE	30 - 60 mg/L	< 10 mg/L
TEMPERATURE	600 C	< 30 <sup>0</sup> C

**4.12 ROADS**

Roads should be designed to transport all the vehicles that are likely to be used during construction and the project's life. Roads and pavements must be under the National Building Code of Practice or equivalent.

**4.13 GENERATOR BUILDING**

The dimensions of all buildings must be such that they provide a generous space for the safe installation and proper operation and maintenance of the project. In particular, a generous space must be provided immediately in front, behind, and next to all the floor elements. The design of all cottages must guarantee that the noise, vibration, and temperature levels are within the allowed limit.



#### 4.14 OPERATION PHASE

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##### 4.14.1.1 TRAFFIC

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The entrance to the project has been designed to facilitate the easy exit and from Narayanganj, Dhaka- Sylhet highway Road and to prevent traffic congestion at the entrance.

##### 4.14.1.2 WATER DEMAND

---

The total estimated demand for water by the project during operation will be approximately 16 m<sup>3</sup>/day. This will be met from their own Deep Tube-well.

#### 4.15 STP (SEWAGE TREATMENT PLAN)

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##### Details Calculation of Sewage:

1. Office Staff = 1000 Persons.

Water required = 1000 X 15 liter/person = 15,000 liter/day

Total waste water = 30,000 liter/day

10% adding as free board in basic design = 15,000 + 1500 = 16500 or 16.5 m<sup>3</sup> per day

Less Contaminated effluent is 0%

Operated continuously for 16 hours a day

**The project will use a septic tank with a capacity of 16 m<sup>3</sup> per day or 1 cubic meter per hour for the sanitary waste.**

##### 4.15.1 WATER POLLUTION

---

The amount of wastewater produced from the project is very high. Only the printing section produced wastewater. When the printing is finished, the print screen needs to be washed, and that's the only way of making wastewater. To treat the wastewater, use a closed drainage system and 50 m<sup>3</sup> per hour STP for sewage treatment

##### 4.15.2 SOLID WASTE

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Solid waste like poly bags, wool, cotton, waste packages, cartoons, etc., are sold to a 3<sup>rd</sup> party.

##### 4.15.3 HAZARDOUS MATERIALS

---

Raw materials that are used for production purposes are non-hazardous. Before use, those materials are kept in a closed area, and the technician handles the materials to maintain safety.

**Hazardous materials, such as chemicals, present a health and safety risk and will be correctly handled, stored, and disposed of.**

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#### 4.15.4 LIQUID WASTES

---

- Dyeing Section.
- Fueling facilities are another potential generator of waste liquids. Hydrocarbons, glycols, and other pollutants in these liquids can contact waterways and aquatic life through spills and leaks from storage tanks.

**The authority will install 100 m<sup>3</sup> per hour ETP to treat the wastewater and use a closed drainage system. The ETP Drawing design is attached with the annexure**

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#### 4.15.5 NOISE

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As vessels are being constructed on many levels, falling objects are a hazard. In addition, personnel can be hit by falling or moving objects during fabrication, causing failure of fixtures and conveyance gantries.

Confined spaces

Many areas on a vessel are designated as confined spaces, which can result in vapor build up.

Poor management of materials, waste and discharges from production presents a potential risk of soil contamination. Accidental discharges from ETP may also contaminate groundwater in areas where soils beneath the site are permeable.

Contamination could arise from deteriorating drainage networks.

Other Potential Environmental, and Health and Safety Risks/Liability Issues

Machinery

All equipment should have safety guarding, and workers should be issued with appropriate personal protective equipment to protect against unavoidable sharp items and edges. Particular attention should be paid to metal-cutting equipment.

Occupational Dermatitis

This can occur due to contact with antioxidants, chromates and solvents.

To protect workers and surroundings from Noi's pollution, authority changes in the workplace that reduce or eliminate worker exposure to noise hazards such as:

- Operate noisy machines during shifts when fewer people are exposed;
- By applying job rotation policy;
- Limit the amount of time a person spends near a noise hazard;

- Provide quiet areas where workers can gain relief from noise hazards;
- Restrict how close a worker can get to a noise hazard. Therefore, controlling noise hazard exposure by maintaining a distance from the noise hazard is often an effective, simple, and inexpensive administrative control
- Provide workers with PPE

**4.16 PROTECTION ACROSS THE RIVER**

**4.16.1 SHITALAKHYA RIVER**

Shitalakhya River

Shitalakhya River is a distributary of the Brahmaputra River. It remains navigable around the year. Samples were collected from three different locations to monitor water quality. Demra Ghat, Ghorasal Fertilizer Factory (GFF) and near ACI factory at Narayanganj.

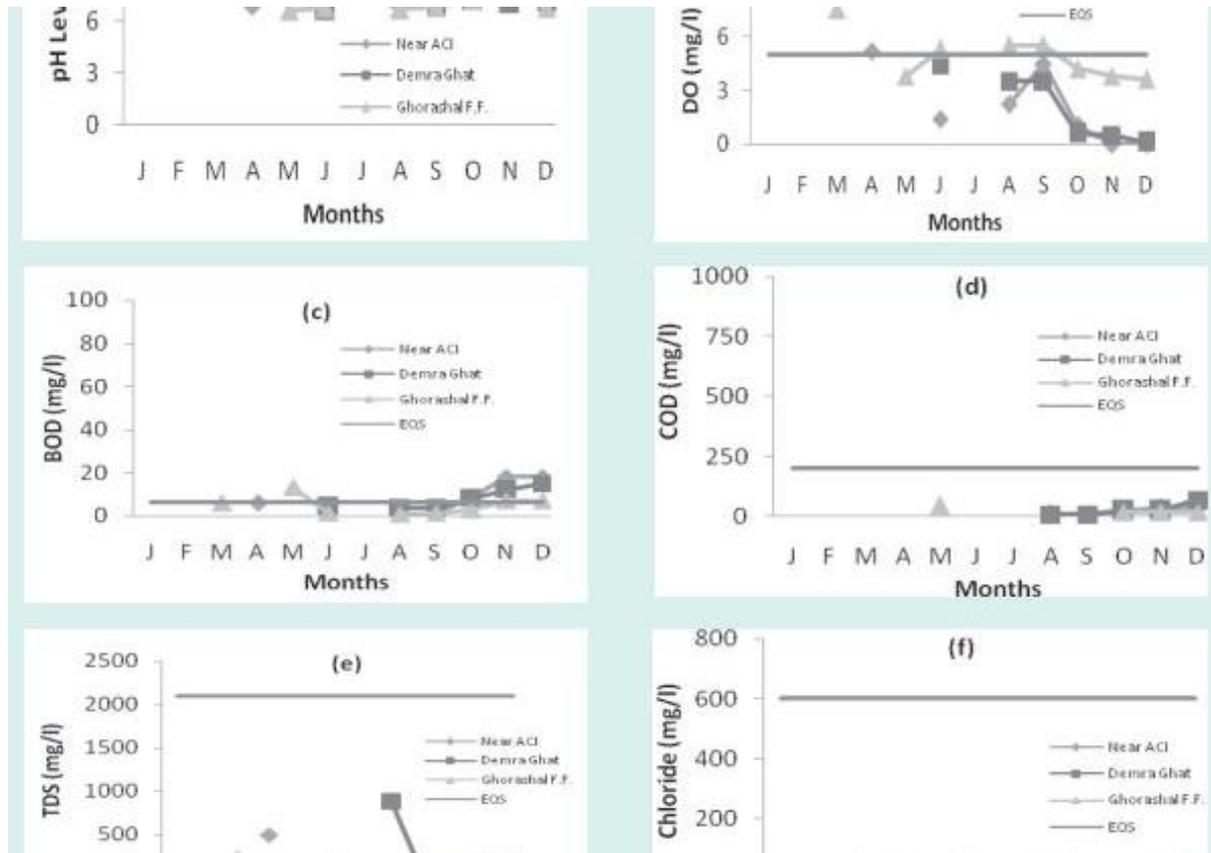


FIGURE 4-6 GRAPHICAL PRESENTATION OF PH, DO, BOD, TDS, CHLORIDE AND TURBIDITY OF SHITALAKHYA RIVER

Fig.2. Graphical presentation of pH, DO, BOD, COD, TDS and Chloride of Shitalakhya River in 2015. In 2015, pH of Shitalakhya river water was within the EQS (6.5-8.5) range for inland surface water. The maximum pH was 7.97 in March and the minimum PH was 6.66 in May at Ghorasal

Fertilizer Factory (G.F.F) respectively (Fig.2a). In 2014, pH varied from 6.8 to 7.8. In 2015, the maximum DO (5.5 mg/l) was found at G.F.F in August and the minimum (0.0 mg/l) was found near ACI factory in November and December (Fig.2b). In 2014, DO varied from 0.0 to 5.6 mg/l. In 2015, BOD at Demra Ghat was very high during dry period. Near Ghorasal Fertilizer Factory BOD was within the EQS (<6 mg/l) for fisheries in May and June. Highest value of BOD (18 mg/l) was found near ACI Factory in December and lowest (0.8 mg/l) was in August near G.F.F point (Fig.2c). In 2014, BOD concentration varied from 0.0 mg/l to 32 mg/l. In 2015, COD level was within the EQS (200 mg/l) for wastewater after treatment from industrial units at all locations of Shitalakhya river. The maximum COD (69.28 mg/l) was at Demra Ghat in December and the minimum COD (7.25 mg/l) was at Damra Ghat in September (Fig.2d). In 2014, COD level varied from 4.0 mg/l to 141 mg/l. TDS of Shitalakhya river varied from 48.5 to 484.2 mg/l against the EQS (2100 mg/l) for wastewater after treatment from industrial units. In dry season maximum TDS (484.2 mg/l) was at Damra Ghat and the minimum (48.5 mg/l) in September near G.F.F (Fig.2e). In 2014, TDS range was 70.6 to 668 mg/l. Chloride concentration of the Shitalakhya river in 2015 was below the EQS (600 mg/l) for wastewater after treatment from industrial units. The maximum Chloride (35.98 mg/l) was found at Damra Ghat in December and the minimum was 4.0 mg/l near G.F.F in September, 2015 (Fig.-2f). In 2014, Chloride concentration varied from 3.1 mg/l to 44 mg/l.

TABLE 4-3 SUSPENDED SOLID (SS) OF SHITALAKHYA RIVER WATER

Sampling Locations	SS (mg/l)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Narayanganj (Near ACI)	-	-	-	32	-	76	-	36	10	48	24	24
Demra Ghat	-	-	-	-	-	34	-	27	27	24	36	18
Ghorashal Fertilizer Factory (GFF)	-	-	12	-	32	47	-	26	12	54	33	28
<b>EQS for wastewater after treatment from industrial units 150 mg/l</b>												

Source: water quality report department of Environment

SS of Shitalakhya river water at different sampling locations was within the EQS (150 mg/l). Maximum SS concentration of Shitalakhya river was 76 mg/l near ACI Factory in June and minimum 12 mg/l in September at the same location (Table-4).

TABLE 4-4 ELECTRICAL CONDUCTIVITY (EC) OF SHITALAKHYA RIVER WATER

Sampling Locations	EC (µmhos/cm)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Narayanganj (Near ACI)	-	-	-	930	-	175.9	-	135	112.9	254	288	288
Demra Ghat	-	-	-	-	-	108.4	-	190.7	190.7	241	304	310
Ghorashal Fertilizer Factory (GFF)	-	-	434	-	142.4	127.6	-	118.2	161.1	301	296	374
<b>EQS for wastewater after treatment from industrial units 1200 µmhos/cm</b>												

Source: water quality report department of Environment

EC of Shitalakhya river at different locations was mostly within the EQS (1200 µmhoms/cm) for treated wastewater from industrial units (Table-5) except in the month of April. The maximum EC (930 µmhoms/cm) was near ACI factory in April and the minimum EC (108.4 µmho/cm) was at Demra Ghat in June.

TABLE 4-5 TOTAL ALKALINITY OF SHITALAKHYA RIVER WATER (SOURCE: WATER QUALITY REPORT DEPARTMENT OF ENVIRONMENT)

Sampling Locations	Total Alkalinity (mg/l)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Narayanganj (Near ACI)	-	-	-	80	-	36	-	64	52	60	100	100
Demra Ghat	-	-	-	-	-	32	-	60	60	72	140	120
Ghorashal Fertilizer Factory (GFF)	-	-	170	-	40	40	-	38	44	84	70	70
EQS for wastewater after treatment from industrial units 150 mg/l												

Maximum T. Alkalinity (170 mg/l) was near Ghorasal Fertilizer Factory in March and that of minimum was (32 mg/l) at Demra Ghat in June.

#### 4.17 KEY IMPROVEMENTS TO PROTECT RIVER

- ✓ Development of an innovative method to safely reduce the risk of toxic particulates from cleaning and maintenance activities which, would greatly improve occupational health and safety, increase productivity and decrease overall cost.
- ✓ Wash wastewater treatment facility to reduce contaminant loading and potential release into watercourses and drainage systems. Have closed drainage systems on site.
- ✓ Introduce maintenance, housekeeping, materials management and chemical and materials inventory control practices that minimize activity waste.
- ✓ Apply closed-loop recycling for processing wastewater, with ETP
- ✓ Regular inspection should be carried out of all sites to prevent leakage and product loss;
- ✓ Provision of secondary spill containment for bulk storage tanks and silos;
- ✓ Good housekeeping should be maintained at all times in all areas;

#### 4.18 ALTERNATIVE ANALYSIS

There is little scope for the consideration of alternatives in a project that is linking an existing distribution service to individual household and commercial users. However, during the planning stage and preliminary design, alternatives were considered in selecting the site in the present location. Skill manpower is available in the area. The site is enriched with all the facilities that are most important for this project. The project is also capable of easy access. It is away from flood plains, wetlands, and other environmentally sensitive areas. It has been considered for public safety, and places such as schools, hospitals, and places of worship were avoided as all public utilities were available wherever possible. Considering all of these factors, **as the site is perfect for the project in terms of facilities, there is no plan of the authority of Midland Knitwear Limited to look into an alternative site.**

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**CHAPTER 5 SITE DETAILS**

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**5.1 LOCATION OF THE PROJECT SITE**

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**MIDLAND KNITWEAR LIMITED** will be located at **52/03, Block- E, Shantinagar, Shiddhirganj, Narayanganj City Corporation, Narayanganj**. The site is surrounded by vacant land, Industrial area and road.

- **North:** To the north of the proposed project site, around 1.6 km vacant area, then local residence and small local factory.
- **South:** To the south of the proposed project site, around 20 feet shahebbari road-2, then Abloom Design composite ltd. And IR bulb company, Abdul Aziz textile group then Local factory and few residences.
- **East:** to the east side of the project, orient industry, Local residence and vacant space then factory
- **West:** To the west of the proposed project site, To the east of the proposed project site, vacant plot and local commercial space then Eurotex knitwear limited then city corporation Drane then local residence

The location of the project is shown in different maps in the following figures and the layout plan of the said project attached in the Annexure.



FIGURE 5-1 SITE LOCATION OF MIDLAND KNITWEAR LIMITED

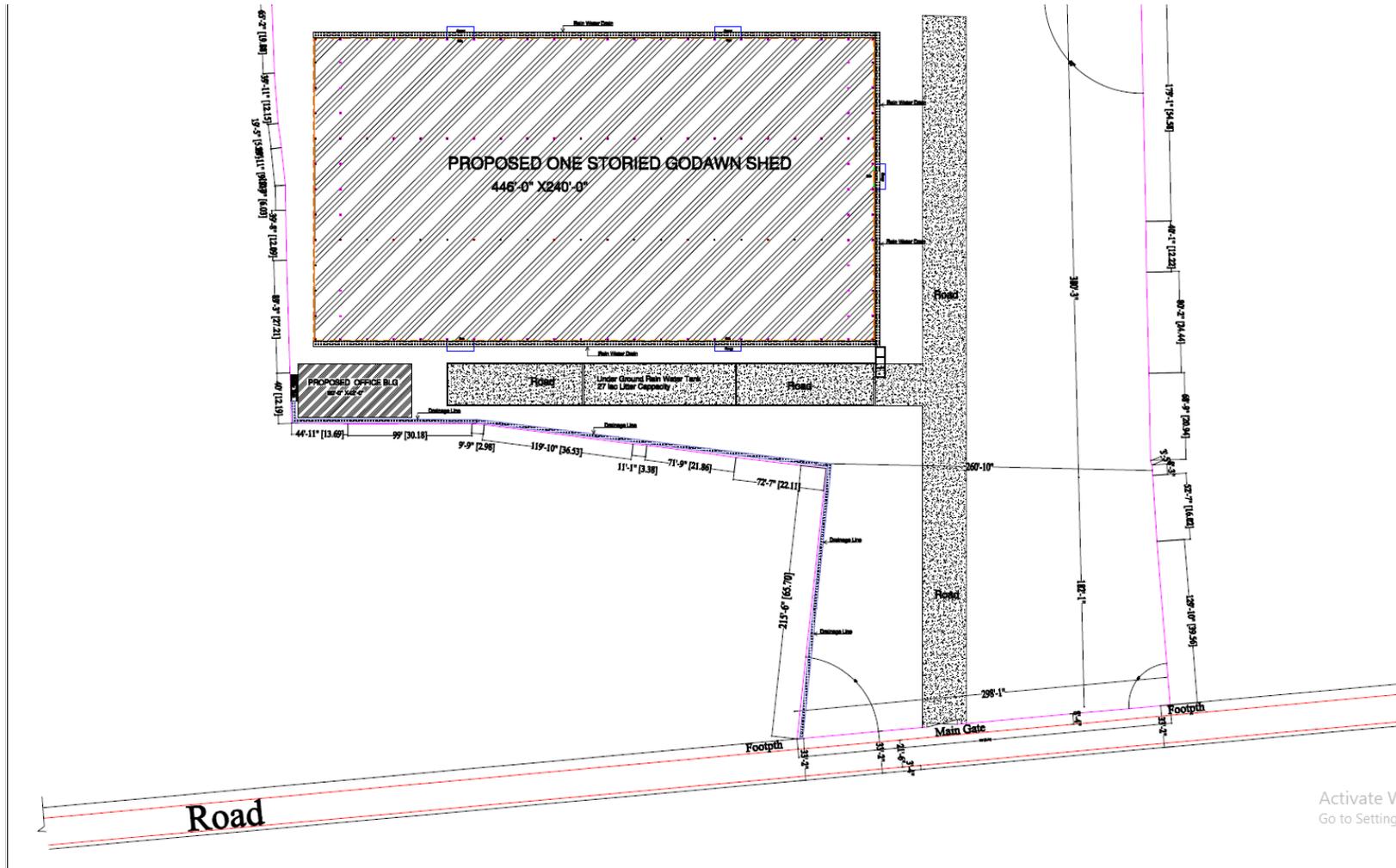


FIGURE 5-2 LAY-OUT OF THE PROJECT

## 5.2 JUSTIFICATION FOR SELECTING THE SITE

---

Midland Knitwear Limited will be located at **52/03, Block- E, Shantinagar, Shiddhirganj, Narayanganj City Corporation, Narayanganj**. The project location is well suited for the project because-

1. Connectivity- Shipping car is heavy, so highway connection.
2. Sheltered location- this location is on Industrial weather. Thats why many Industries are near.
3. The water depth at this area is suitable for Industries (minimum 6-8 meters at low tide).
4. Accessibility to the port- The location is perfect to handles container and bulk traffic. This reduces logistic costs of bringing equipment.

## 5.3 PROJECTS WITHIN THE STUDY AREA AND LAND USE

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- **Abloom Design LTD** is a 100% export-oriented knit garment factory known for its commitment to quality and reliability. The company collaborates with renowned international buyers, delivering top-notch products that meet global standards. Abloom Design LTD focuses on innovation and sustainability, striving to exceed customer expectations in every aspect of production.
- **Amin Square Consumer Products Limited**, has started its journey in 2016 as a member of Amin Square Group, the leading corporate house in Bangladesh. Within a short span of time, it has been able to create a strong foothold in the market through its quality products and customer services. For its obsession with quality management, the company had obtained the international quality standard ISO 9001 in 2005. Strong commitment to quality, adoption of advanced technology, stress on human resource development, focus on continuous improvement and introduction of new products for the growing markets have given the company a decisive position in the industry.  
The company assures to meet the increasing demand for quality products both at home and abroad. The products with international standards are being exported to 30 countries. Dedication to quality, innovative products, customer service and reasonable price has given the company a unique position in the food business.
- **SSG group** Our range of products cater to a wide circle of customer groups, households, corporates and industrials alike. Product range includes Compact Fluorescent Lamp (CFL), Incandescent Lamp (GLS), Light Emitting Diode (LED), Fluorescent Tube Light (T8, T5), Super Star Fan, Switches & Sockets, Fan, Fluorescent Lighting Fixture, PVC Insulating Tape, Electronic Ballast, and Distribution Board.  
In addition, Super Star Group is the exclusive distributor of Kawamura Electric Inc. of Japan and Federal Electric of Turkey for marketing and distribution of their world-renowned Circuit Breaker and other electrical safety related products in Bangladesh. Khaitan Fan of India is another well reputed name associated with the group.

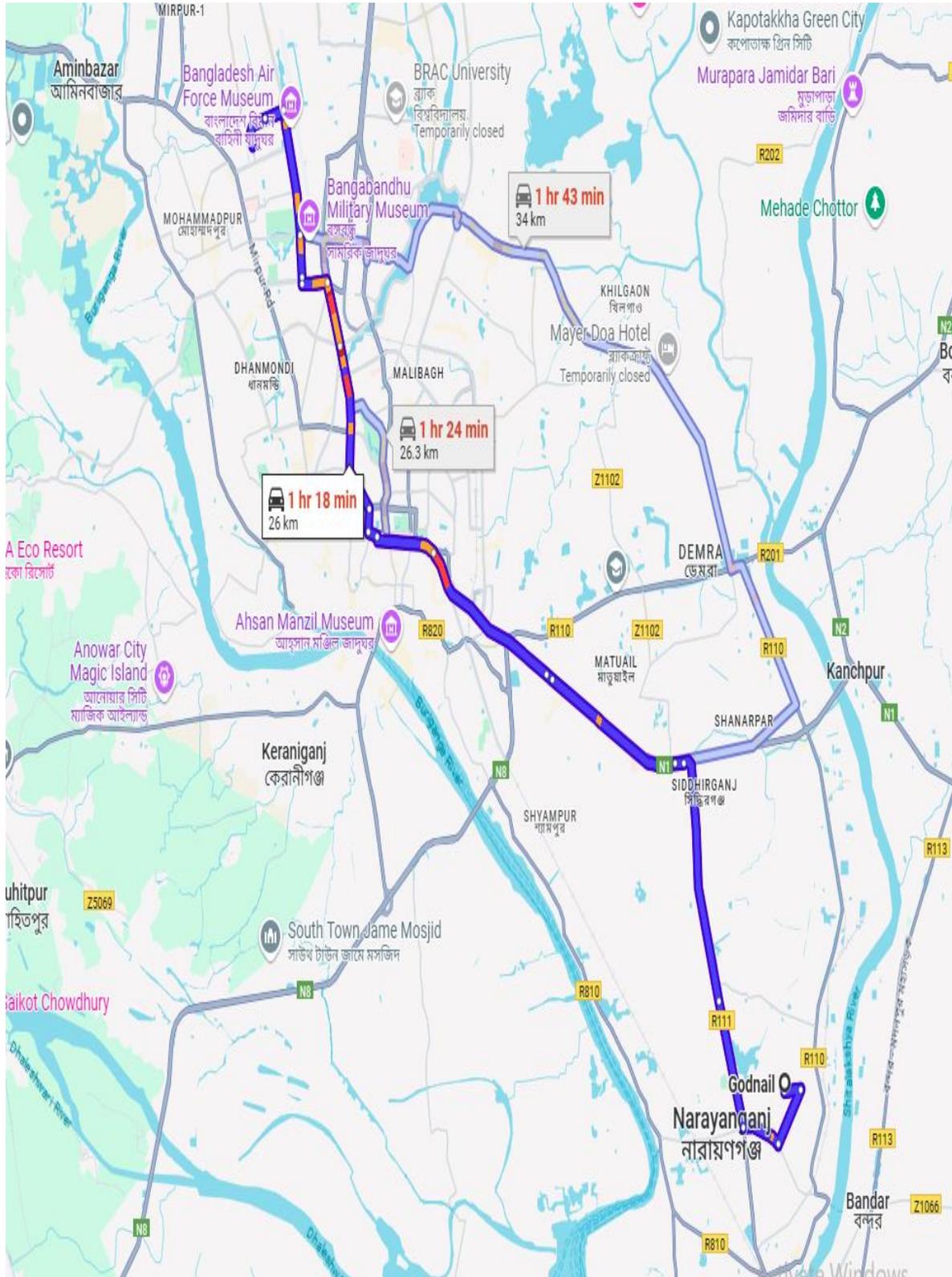


FIGURE 5-3 DISTANCE FROM THE PROJECT SITE TO DOE

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**CHAPTER 6 BASELINE ENVIRONMENT**

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**6.1 GENERAL CONSIDERATION**

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The details of the existing environmental settings and socio-economic baseline condition of the project site are presented in this chapter. The baseline environmental and socio-economic conditions have been established in respect of physical environment, water resources, land resources and socio-economic settings of the selected study area using both primary and secondary data. This information forms the basis to analyze the probable impacts of the project activities.

**6.2 STUDY AREA**

---

**MIDLAND KNITWEAR LIMITED** will be located at **52/03, Block- E, Shantinagar, Shiddhirganj, Narayanganj City Corporation, Narayanganj.**

The baseline study records are required for environmental settings against which potential impacts from the construction and operational phases of the project can be compared. In the present study, the different environmental components were examined to set the baseline.

<b>S. No.</b>	<b>Point</b>	<b>Date</b>
01	23°38'55.0"N 90°30'04.2"E	20/07/2024
02	23°38'56.2"N 90°30'04.3"E	20/07/2024

**Test Report No: BD/T(W)/24/009697****Dated: 2024-07-29**

Bangladesh

Applicant : **MIDLAND KNITWEAR LIMITED**  
52/03, Block- E, Shantinagar, Shiddhirganj, Narayanganj City Corporation, Narayanganj.

Attention : Sk. Abdul Latif

Sample Description : (A) Wastewater Sample from Local channel

Sample Quantity : In Plastic Bottle (2.0 Litre)

Sampled by : Not available as sample submitted by client

Client's Representative : Sk. Abdul Latif

Sample Type : Not available as sample submitted by client

Sampling Protocol : Not available as sample submitted by client

Sample condition : Good

Date of Sample Receipt : 16/03/2024

Test Analysis Started : 17/03/2024

Test Analysis Completed : 29/03/2024



By accepting this document the customer hereby agrees and accepts the 'Terms & Conditions' and the relevant 'Testing & Certification Regulations' of TÜV SÜD Bangladesh Pvt. Ltd. Which are available at Company's website at the link- <https://www.tuvsud.com/en-in/terms-and-conditions>

Note: The test report is electronically generated. Hence original signature is not required.

Note: (1) The results relate only to the items tested, (2) The test report shall not be reproduced except in full without the written approval of the laboratory, (3) For details of the accredited scope, please contact laboratory or accreditation body website. (4) Unless otherwise agreed upon, PASS or FAIL verdicts are given based on the measured values without any considerations of measurement uncertainties. Every test method has a measurement uncertainty which has been evaluated by the laboratory and are available on request. By taking measurement uncertainties into account it might happen that measured values can neither be assessed as PASS nor as FAIL

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**Test Report No: BD/T(W)/24/009697**



Bangladesh

SUMMARY OF TEST RESULTS	
TEST REQUESTED	RESULT
	A (inlet)
pH value	■
Total Suspended Solids (TSS)	■
Chemical Oxygen Demand (COD)	■
Biochemical Oxygen Demand (BOD)	■
Colour	■

Note/ Key:

- ■ — Detected
- □ — Not Detected
- - - — Not Tested

Authorized By:

Md Shafikul Islam  
Authorized Signatory

Please Contact:

For Any Technical Issues: Md. Shafikul Islam  
E-Mail - [Shafikul.Islam@tuvsud.com](mailto:Shafikul.Islam@tuvsud.com)  
For Any Complaint: Md. Kamruzzaman at [Kamruz.zaman@tuvsud.com](mailto:Kamruz.zaman@tuvsud.com)

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**Test Report No: BD/T(W)/24/009697**



Bangladesh

**Test Results: Sample A (ETP Inlet Water)**

**1.0 Conventional Parameters**

SL. No.	Parameters	Test Method	Test Results	Limit of Quantification (LOQ)
1	pH Value	USEPA 150.1	11.9	-
2	Total Suspended Solids (TSS) (mg/l)	APHA 23rd Edition 2017 (2540 D)	38	5
3	Chemical Oxygen Demand (COD) (mg/l)	APHA 23rd Edition 2017 (5220 D)	1480	5
4	Biochemical Oxygen Demand (BOD) (For 5 days at 20 °C) (mg/l)	APHA 23rd Edition 2017 (5210 B)	320	5
5	Colour 465 nm (Pt-Co)	With Reference to ISO 7887-B	3680	-

Remark- Here; (mg/l): milligram per litre; °C: Degree Celsius

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**Test Report No: BD/T(W)/24/009697**



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**PICTURE OF THE SAMPLE**



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FIGURE 6-1 MAP OF NARAYANGANJ DISTRICT

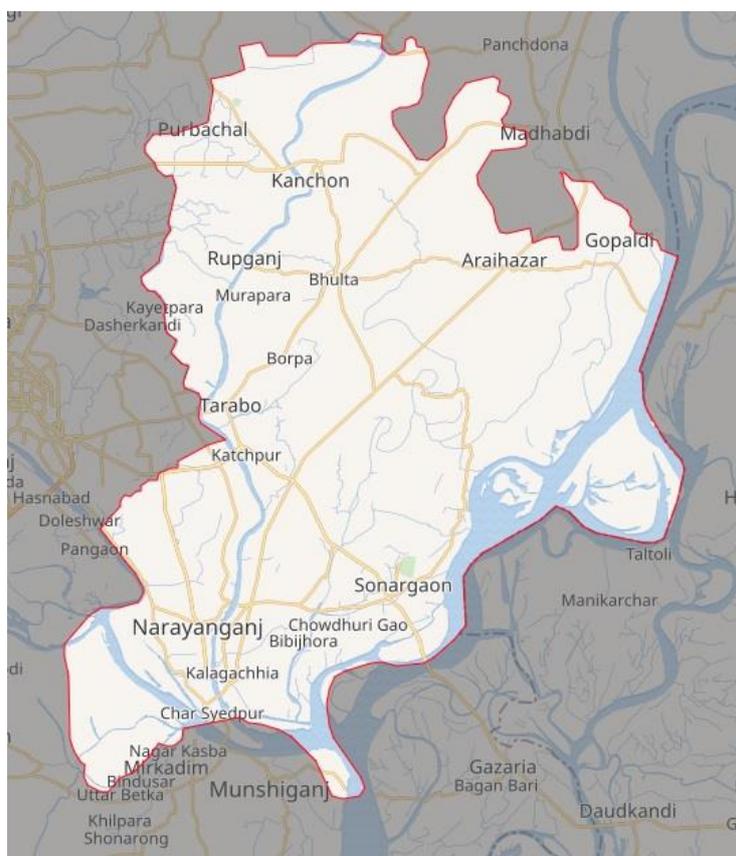


FIGURE 6-2 NARAYANGANJ ZILA MAP

## 6.3 TOPOGRAPHY, SOIL AND GEOLOGY

### 6.3.1 TOPOGRAPHY

Puddling of clay soils for rice transplanting causes a loss of soil structure and vertical shrinkage cracks that are hypothesized to hamper sunflower root growth in the following dry season. To alleviate soil constraints for sunflower root growth and yield, we examined the effects of three levels of mulch and two irrigation regimes in the dry season on a clay-textured soil in the coastal zone of Bangladesh. These treatments were no-mulch, rice straw mulch at 5 t ha<sup>-1</sup> and 10 t ha<sup>-1</sup>, irrigation applied to the field capacity (I1) and a water supply double that of the I1 treatment (I2). The rice straw mulch significantly increased soil water content by 3–9% and decreased soil penetration resistance by 28–77% and crack volume by 84–91% at A 0–30 cm soil depth relative to the no-mulch treatment. The better root development with the rice straw mulch increased sunflower yield by 23%. No benefit or further reduction in soil penetration resistance or yield improvement was obtained from increasing the level of mulch from 5 to 10 t ha<sup>-1</sup> or the volume of irrigation water. It is concluded that ameliorating soil constraints by mulch application led to better root growth in the upper root zone and the increased yield in the clay soil.

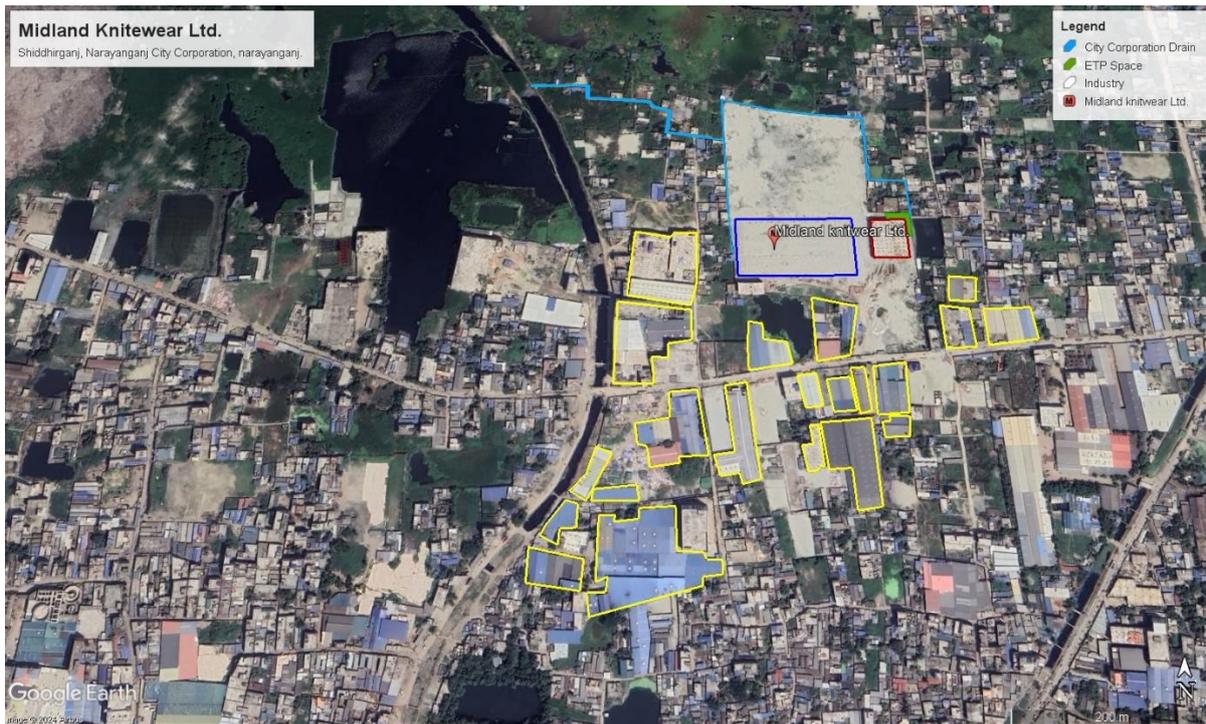


FIGURE 6-3 TOPOGRAPHIC MAP OF THE PROJECT

### 6.3.2 SOIL CHARACTERISTICS

Geological Set-Up and Soil Composition & Regional Geology:

Geologically, the project area is located in the central edge of Narayanganj terrace. The elevation of Narayanganj Terrace is bounded by number of faults. The Terrace is formed of elevated dome shaped and dish shaped depressions resulted due to erosion. The depressions are interconnected by intricate streams of deep valleys. The present Site is located at a Shallow depression of the Terrace. The site is located in the deeper part of Bengal Basin. No Surface Folding or Faulting could be identified in and the area. The project area is located in the Seismic Zone-ii of Seismic zoning map of Bangladesh Where the Basic Seismic Co-efficient may be considered around 0.05.

Description of soil Composition:

The following terms are used in this report for description of soil composition;

Trace: 1 to 10%

Little: 11 to 20%

Some: 21 to 35%

Sandy: 36 to 50% Sand

Clayey: 36 to 50% Clay

Silty: 36 to 50% Silt

**All the test report is already described on the feasibility report which is already submitted to DoE.**

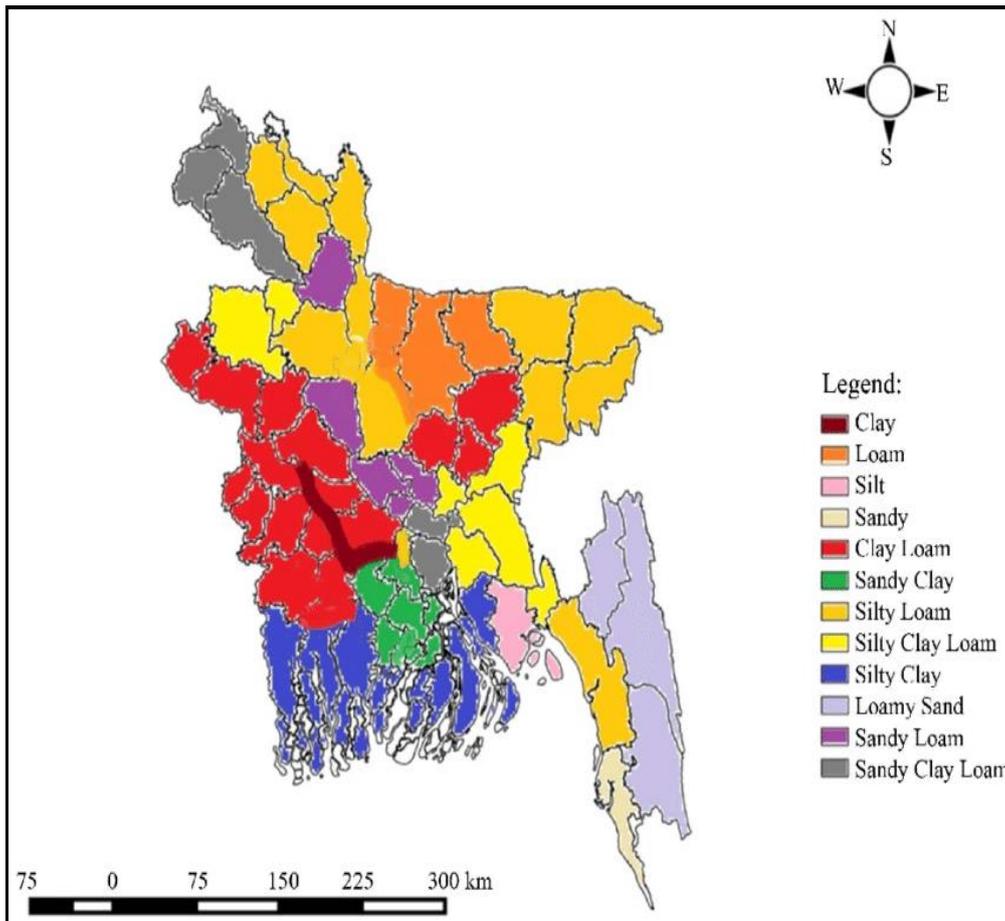


FIGURE 6-4 SOIL TEXTURE OF BANGLADESH

## 6.4 LAND USE OF THE STUDY AREA

Correlation Table of Soils Based on SPT Values:

Two tables for Non-Cohesive and Cohesive Soils Based on N-values as below: Values of unit Weight and Angle of Internal Friction of Non-Cohesive soil based on N-values (After K. Terzaghi and R.B. Peck):

TABLE 6-1 CORRELATION TABLE OF SOILS BASED ON SPT VALUES

N-Values	Condition	Relative Densit	Angle of friction	Internal	Moist unit wt. In pcf.
0 to 4	Ve Loose	0.0-2	25-30		-100
4 to 10	Loose	0.2-0.4	30-35		-115
10 to 30	Medium	0.4- 0.6	35-40		0-130
30 to 50	Dense	0.6-0.85	40-45		110-140
Over SO	Ver Dense	1.00	45		130-150

The tabulated values apply for dry moist cohesionless sand. For Silty sands the bearing capacity values must be reduced by study of grain size classification and applying judgement. Correction

for water table close to bottom of foundation the bearing values should reduce to half. The bearing values are, however, not affected by the water table at a depth greater than 1.5B below foundation level, B is the least dimension of the bottom of foundation. Bearing values for intermediate position of water table may be reduced by linear interpolation.

Values of Approximate Unconfined Compressive Strength Based on N-values for Cohesive Soil (After K. Terzaghi and R.B. Peck):

TABLE 6-2 VALUES OF APPROXIMATE UNCONFINED COMPRESSIVE STRENGTH BASED ON N-VALUES FOR COHESIVE SOIL

N-values	Condition	Unconfined Compressive Strength in Tsf.
0-2	Very soft	Below 0.25
2-4	Soft	0.25-0.50
4-8	Medium	0.50-1.00
8-15	Stiff	1.00-2.00
15-30	Very Stiff	2.00-4.00
Over 30	Hard	Over 4.00

In the above table the shear strength of cohesive soil is equal to 1/2 of unconfined compressive strength and the angle of shearing resistance is equal to zero. It should be remembered that the correlation for cohesive soil is always much reliable.

**PHYSICAL PROPERTIES:**

The physical properties of the sub-soil formation of the project area have been evaluated by the execution of borings overall physical properties may be summarized as follows:

TABLE 6-3 RANGE OF VARIATION IN LABORATORY TESTS RESULTS:

Name of the Soil Test	No of Tests	Range of variation
Unconfined Compression Test		Pl. See the Test Summary
Direct Shear Test		do
Liquid Limit Test		do
Plastic Limit Test		do
Specific gravity Test		

**ENGINEERING PROPERTIES:**

The engineering properties of soil, including the cohesion, compressibility and the angle of granular friction have been determined by performing laboratory tests on the soil samples collected during field investigation. These are as follows:

Cohesion: The values of cohesion, as reported from the performance of unconfined compression tests.

Compressibility The top layer of firm clay has been observed moderately compressible in nature by consolidation tests.

Angle of Internal Friction: The angle of internal friction values of the Investigated values of soil, as reported from the performance of direct shear tests.

## 6.5 CLIMATE AND AVERAGE WEATHER YEAR-ROUND IN

### 6.5.1 TEMPERATURE AND PRECIPITATION

The "mean daily maximum" (solid red line) shows the maximum temperature of an average day for every month for Narayanganj. Likewise, "mean daily minimum" (solid blue line) shows the average minimum temperature. Hot days and cold nights (dashed red and blue lines) show the average of the hottest day and coldest night of each month of the last 30 years. For vacation planning, you can expect the mean temperatures, and be prepared for hotter and colder days. Wind speeds are not displayed per default, but can be enabled at the bottom of the graph.

The precipitation chart is useful to plan for seasonal effects such as monsoon climate in India or wet season in Africa. Monthly precipitations above 150mm are mostly wet, below 30mm mostly dry. Note: Simulated precipitation amounts in tropical regions and complex terrain tend to be lower than local measurements.

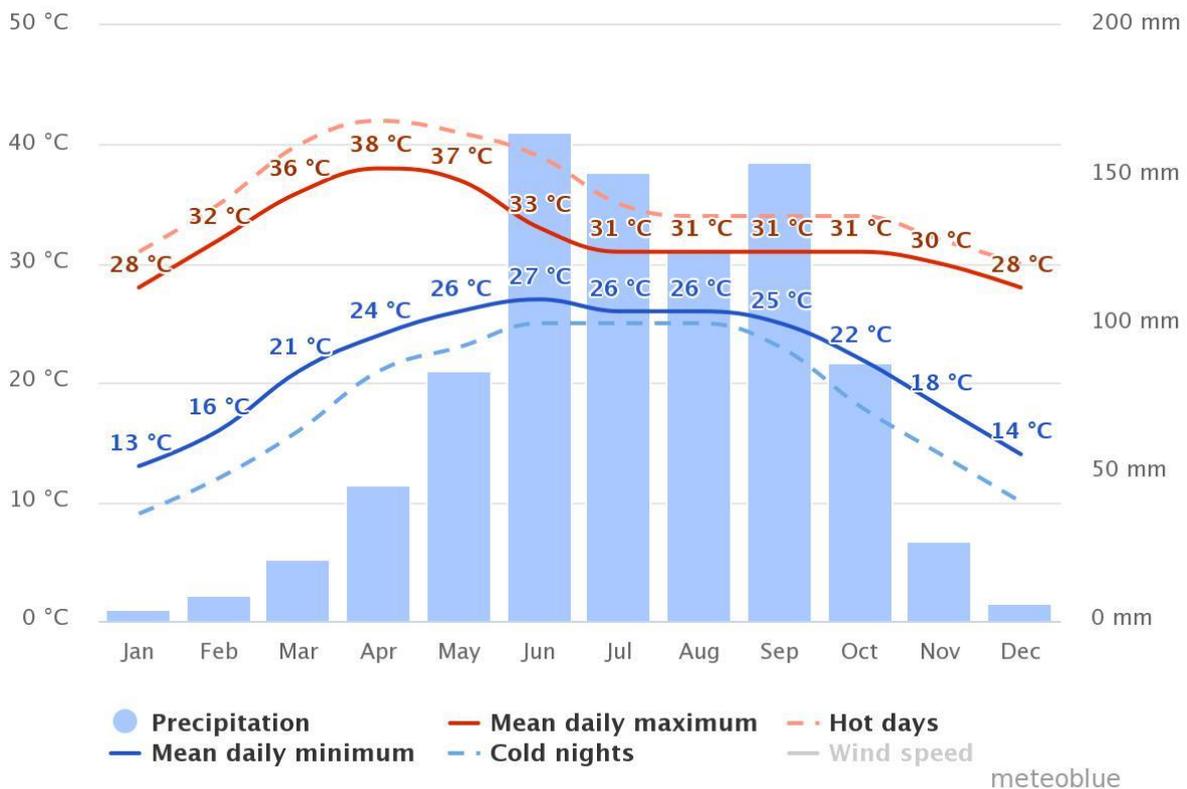


FIGURE 6-5 TEMPERATURE AND PRECIPITATIO CURVE

Bangladesh Meteorological Department

Climate Division, Agargaon, Dhaka-1207

Station: Dhaka

Monthly average Dry-bulb Temperature in degree Celsius of Narayanganj

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
<b>2011</b>	17.3	21.9	26.3	28.5	29.7	29.3	29.3	28.5	28.6	28.7	24.1	19.2
<b>2012</b>	18.8	21.9	27.5	29.5	31.1	31.1	29.3	29.2	29.1	27.5	23.4	18.4
<b>2013</b>	17.5	21.7	27	29.4	28.8	30.1	29.3	28.9	29.1	27.3	23.6	20.1
<b>2014</b>	17.5	21	26.4	31.1	30.8	29.9	29.4	29.2	29.2	27.9	23.8	18.9
<b>2015</b>	18.8	22.5	25.9	28.5	31	29.6	28.2	29.2	29.3	28	24.8	20.6
<b>2016</b>	18.7	24.3	27.6	31	29.7	29.8	28.8	29.2	29.6	28.4	23.8	20.3
<b>2017</b>	18.8	22.5	25.8	29.4	30.6	29.9	28.9	29.4	29.4	27.6	23.8	20.5
<b>2018</b>	16.7	23.1	27.4	28.4	28.9	29.9	29.3	29.7	29.8	27.5	24.2	18.9
<b>2019</b>	18.5	21.7	26.2	29.3	31.1	30.7	29.8	29.6	28.9	27.6	24.5	19.2
<b>2020</b>	18.3	20.6	26.3	28.6	29.4	29.7	29.8	29.4	29.7	29	24.5	19.4
<b>2021</b>	19.1	22	28.2	30.5	30.2	28.9	29.3	29.3	28.8	28.7	24.1	20.3

## 6.5.2 RAINFALL

A wet day is one with at least 0.04 inches of liquid or liquid-equivalent precipitation. The chance of wet days in Shiddhirganj, Narayanganj, Narayanganj varies very significantly throughout the year.

The wetter season lasts 5.0 months, from May 9 to October 7, with a greater than 34% chance of a given day being wet. The month with the most wet days in Shiddhirganj, Narayanganj, and Narayanganj is July, with an average of 20.1 days with at least 0.04 inches of precipitation.

The drier season lasts 7.0 months, from October 7 to May 9. The month with the fewest wet days in Shiddhirganj, Narayanganj, Narayanganj is January, with an average of 0.8 days with at least 0.04 inches of precipitation.

Among wet days, we distinguish between those that experience rain alone, snow alone, or a mixture of the two. The month with the most days of rain alone in Shiddhirganj, Narayanganj, Narayanganj is July, with an average of 20.1 days. Based on this categorization, the most common form of precipitation throughout the year is rain alone, with a peak probability of 66% on July 9.

The rainy period of the year lasts for 9.1 months, from March 4 to December 6, with a sliding 31-day rainfall of at least 0.5 inches. The month with the most rain in Shiddhirganj, Narayanganj, Narayanganj is July, with an average rainfall of 16.4 inches.

The rainless period of the year lasts for 2.9 months, from December 6 to March 4. The month with the least rain in Shiddhirganj, Narayanganj, Narayanganj is January, with an average rainfall of 0.2 inches.

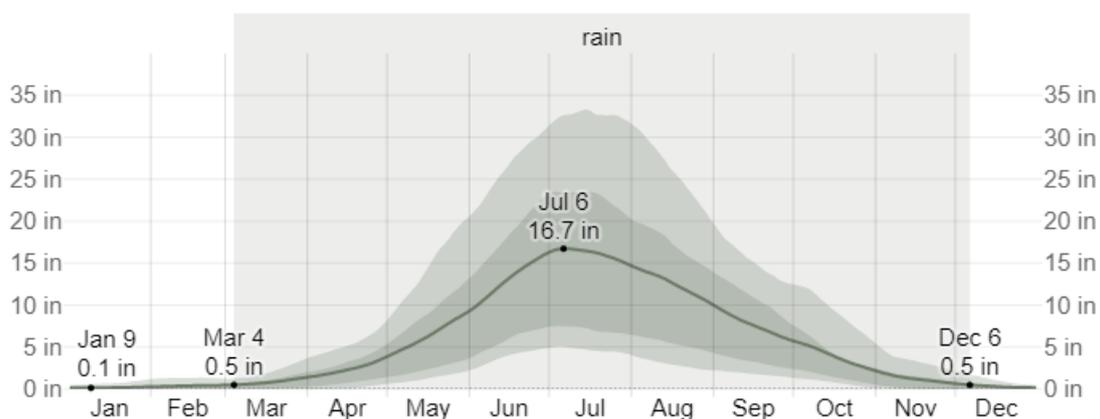


FIGURE 6-6 AVERAGE MONTHLY RAINFALL IN SHIDHIRGANJ, NARAYANGANJ, NARAYANGANJ

The average rainfall (solid line) accumulated over the course of a sliding 31-day period centered on the day in question, with 25th to 75th and 10th to 90th percentile bands.

TABLE 6-4 AVERAGE MONTHLY RAINFALL IN SHIDHIRGANJ, NARAYANGANJ, NARAYANGANJ

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<b>Rainfall</b>	0.2"	0.4"	0.8"	2.2"	6.3"	13.1"	16.4"	12.6"	7.7"	3.9"	1.2"	0.3"

Year	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Spt.	Oct.	Nov.	Dec.	Annual
<b>2011</b>	0	1	16	28	145	381	387	614	367	3	6	0	1948
<b>2012</b>	66	18	1	52	63	255	391	254	374	89	80	2	1645
<b>2013</b>	1	7	19	62	430	212	313	482	278	260	0	0	2064
<b>2014</b>	0	24	5	0	118	447	394	258	205	10	0	0	1461
<b>2015</b>	41	35	28	107	128	318	922	353	293	83	3	6	2317
<b>2016</b>	0	97	5	54	350	353	413	646	148	81	75	0	2222
<b>2017</b>	0	2	59	99	200	356	690	313	175	322	19	51	2286
<b>2018</b>	0	0	1	64	226	266	264	107	106	36	0	3	1073
<b>2019</b>	0	166	74	102	104	114	335	370	283	187	175	15	1925
<b>2020</b>	30	2	10	179	243	350	223	265	172	90	6	0	1570
<b>2021</b>	0	3	0	2	124	468	525	203	339	234	3	66	1967

6.5.3 HUMIDITY

Lower dew points feel drier and higher dew points feel more humid. Unlike temperature, which typically varies significantly between night and day, dew point tends to change more slowly, so while the temperature may drop at night, a muggy day is typically followed by a muggy night. Shiddhirganj, Narayanganj, Narayanganj experiences extreme seasonal variation in the perceived humidity. The muggier period of the year lasts for 8.8 months, from March 7 to December 1, during which time the comfort level is muggy, oppressive, or miserable at least 26% of the time. The month with the fewest muggy days in Shiddhirganj, Narayanganj, Narayanganj is January, with 0.5 days that are muggy or worse.

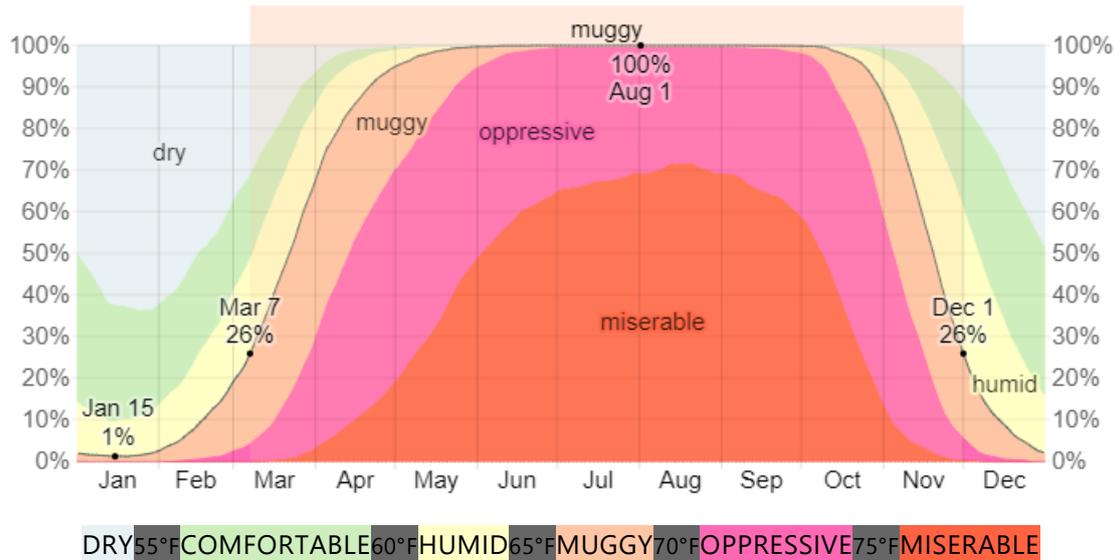


FIGURE 6-7 HUMIDITY IN SHIDDHIRGANJ, NARAYANGANJ, NARAYANGANJ

Year	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
2011	76	70	70	72	78	84	84	88	87	79	81	83	79
2012	80	71	73	77	79	84	90	90	90	85	81	87	82
2013	83	77	70	71	82	84	90	91	85	86	75	78	81
2014	81	73	68	66	74	83	86	85	84	79	75	82	78
2015	80	74	68	76	76	83	90	86	85	81	79	84	80
2016	79	77	74	74	77	83	87	85	82	81	80	82	80
2017	77	72	74	74	75	83	87	86	85	86	79	84	80
2018	78	73	71	73	79	82	86	83	83	80	77	76	78
2019	74	72	72	73	76	81	85	84	86	85	82	81	79
2020	80	72	66	72	76	83	84	85	84	82	74	79	78
2021	78	72	69	66	72	84	85	85	85	82	75	80	77

6.5.4 WIND

The diagram for Narayanganj shows the days per month, during which the wind reaches a certain speed. An interesting example is the Tibetan Plateau, where the monsoon creates steady strong winds from December to April, and calm winds from June to October.

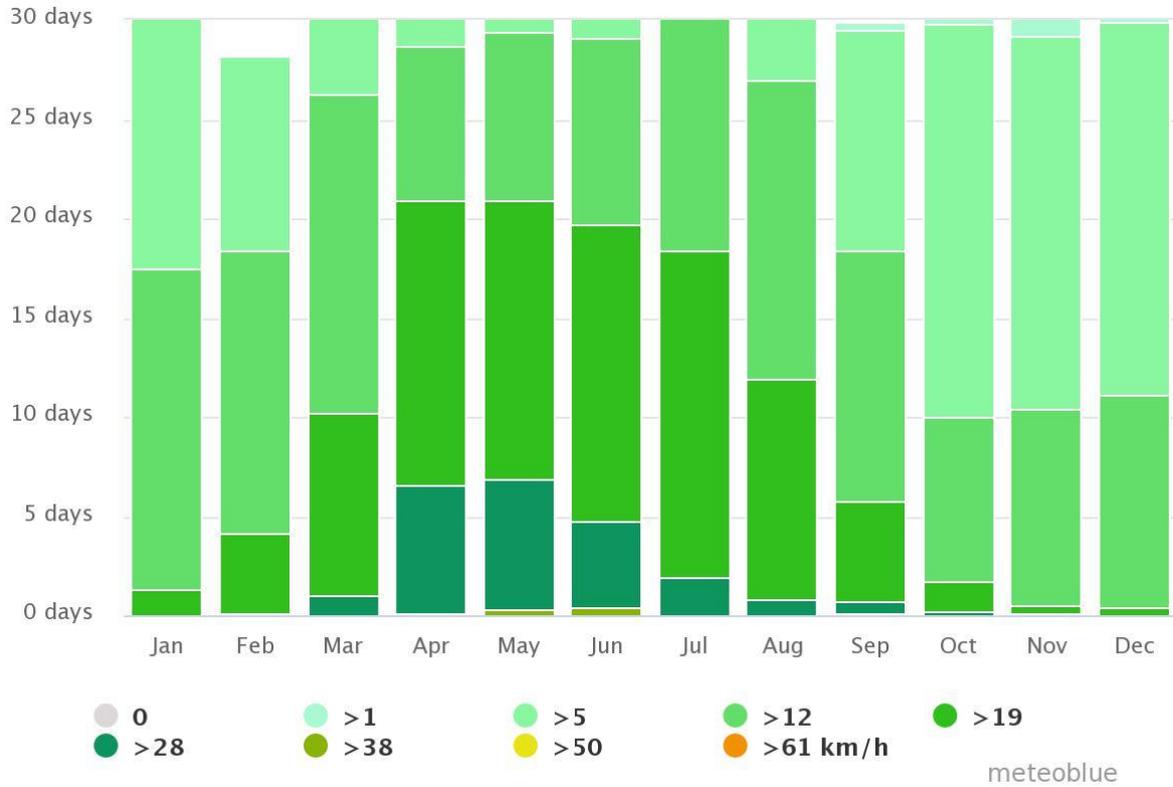


FIGURE 6-8 WIND SPEED UNITS CAN BE CHANGED IN THE PREFERENCES (TOP RIGHT).

The wind rose for Narayanganj shows how many hours per year the wind blows from the indicated direction. Example SW: Wind is blowing from South-West (SW) to North-East (NE). Cape Horn, the southernmost land point of South America, has a characteristic strong west-wind, which makes crossings from East to West very difficult especially for sailing boats.

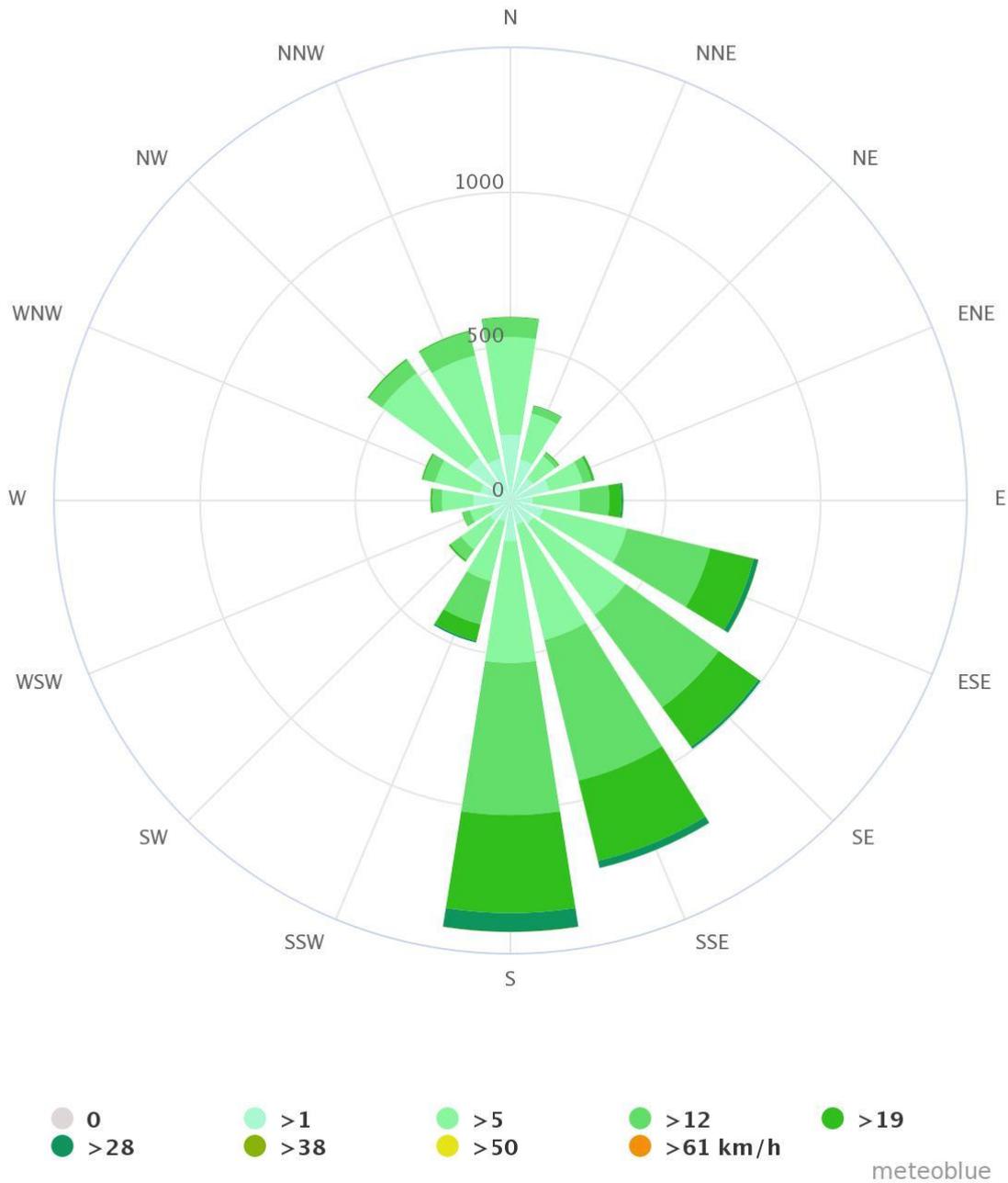


FIGURE 6-9 THE AVERAGE OF MEAN HOURLY WIND SPEEDS (DARK GRAY LINE), WITH 25TH TO 75TH AND 10TH TO 90TH PERCENTILE BANDS.

The average of mean hourly wind speeds (dark gray line), with 25th to 75th and 10th to 90th percentile bands.

TABLE 6-5 AVERAGE WIND SPEED IN SHIDDHIRGANJ, NARAYANGANJ, NARAYANGANJ

Months	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind Speed (mph)	4.5	4.5	4.7	5.1	5.3	6.5	6.6	5.7	4.4	3.8	3.9	4.1

The predominant average hourly wind direction in Shiddhirganj, Narayanganj, Narayanganj varies throughout the year.

The wind is most often from the west for 1.2 months, from February 16 to March 21, with a peak percentage of 40% on March 5. The wind is most often from the south for 6.6 months, from March 21 to October 10, with a peak percentage of 91% on July 10. The wind is most often from the north for 4.2 months, from October 10 to February 16, with a peak percentage of 59% on January 1.

Year	Jan.		Feb.		Mar.		Apr.		May		Jun.		Jul.		Aug.		Sep.		Oct.		Nov.		Dec.	
	Spd	Dir	Spd	Dir	Spd	Dir	Spd	Dir	Spd	Dir	Spd	Dir	Spd	Dir	Spd	Dir	Spd	Dir	Spd	Dir	Spd	Dir	Spd	Dir
2011	2.1	NW	1.9	NW	4.1	S	2.3	S	2.4	S	3	SE	2.1	S	3	SE	2.6	SE	1.2	NW	1.7	NW	1.2	N
2012	2.1	NW	1.9	NW	1.9	S	2.4	S	2.4	S	2.8	S	2.1	S	2.2	SE	2.1	SE	2	S	1.6	NE	1.6	NW
2013	1.9	NW	2.2	NW	2.1	S	2.4	S	2.6	S	2.3	SE	2.3	SE	2.2	S	2.2	S	3.9	SE	1.9	NW	2	N
2014	1.9	NW	2.4	NW	2	NW	2.4	S	2.3	S	2.3	S	2.5	SE	1.9	S	1.9	SE	1.8	SE	1.6	NW	1.5	NW
2015	1.5	NW	1.9	S	2.4	S	2.6	S	2.8	S	3.7	S	2.7	S	3.2	S	3.7	SE	2.8	SE	2.4	NW	2.4	N
2016	2.7	NW	2.6	S	3.1	S	3.2	S	3	S	2.2	S	2.8	S	3.9	SE	2.4	S	2.3	SE	2.3	N	2.2	NNW
2017	1.8	NW	3.5	S	2.8	S	2.7	S	2.6	S	2.8	S	2.7	S	2.8	S	2.3	S	3.2	S	2	W	1.7	N
2018	2.2	NW	1.8	NW	2.5	S	3.1	S	2.7	S	2.3	S	2.5	SE	2.6	SE	2.4	SE	2.5	SE	2.5	S	1.6	N
2019	1.9	NW	2.2	NW	2.3	SW	2.7	S	2.7	S	2.1	S	2.4	S	2.3	S	2.3	S	2.3	S	4.9	E	1.9	N
2020	1.9	N	1.9	NW	2.2	NW	2.5	S	3.4	S	2.8	S	2.4	S	2.6	S	2.2	S	2.2	SE	2	NNW	1.5	NNW
2021	3.3	SE	2.5	S	3.1	S	2.8	S	2.7	S	2.6	S	2.8	S	2.5	S	3.5	SE	2.3	S	1	NW	2	N

## 6.6 HYDROLOGY OF THE STUDY AREA

Due to the increasing population and fast industrialization, the demand for freshwater is increasing. Water pollution not only affects the water quality but also threaten human health and economic development. There is a scarcity of fresh water in, Narayanganj area.

### 6.6.1 WATER QUALITY OF NARAYANGANJ

#### Location, Extent and Accessibility

Surface Water. Shitalakshya is the main river channel flowing from north to south through the middle of the Upazila and on the right side of subproject road. Number of khals/canals flowing through the Upazila area, which are directly connected to the river Shitalakshya. It is note that prior to commencement of the subproject work; contractor shall undertake the surface water quality

test of the subproject area as baseline data. During construction, contractors will be required to conduct surface water quality measurements and ensure that the subproject does not cause deterioration of surface water quality of the subproject surrounding areas. This is included in the environmental management plan. 51. Ground Water. Groundwater is abundant in Bangladesh. Water tables are generally shallow and aquifers are productive. The water table at Narayanganj Upazilla is shallow; however, the main aquifer, which is the source of water supply, is found at a depth of greater than 50 m. Arsenic contamination is generally not present in the project area. As reported by the community people, there is no arsenic contamination in the tube-well water of the project area.

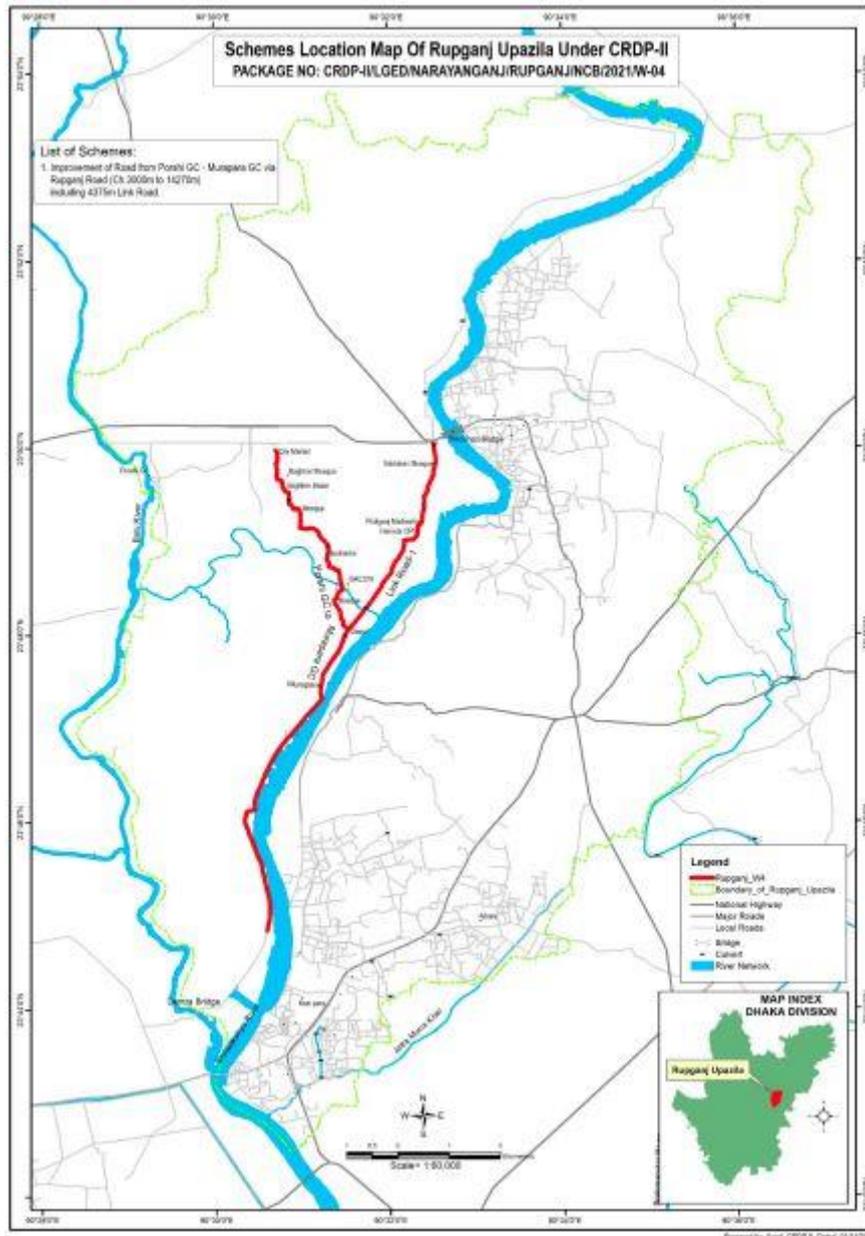


FIGURE 6-10 ASSESSED WATER TECHNOLOGY UNDER NARAYANGANJ UPAZILLA

**6.6.2 NARAYANGANJ WATER QUALITY TEST AND ANALYSIS:**

**Laboratory test result of PSF**

TABLE 6-6 LABORATORY TEST RESULT OF PSF

Sl	Area	Cl mg/l	Fecal Coli form CFU/100ml	EC mg/l	pH	TDS mg/l	Color (TCU)	Remarks
01	Bimol Krisno Shiddhirganj, Narayanganj	216	0	1409	7.8	706	0	Good
02	Shiddhirganj, Narayanganj	65	0	633	7.9	319	0	Good
03	Moddopara Govt.Pukur Shiddhirganj, Narayanganj	46	0	357	7.6	180	0	Good

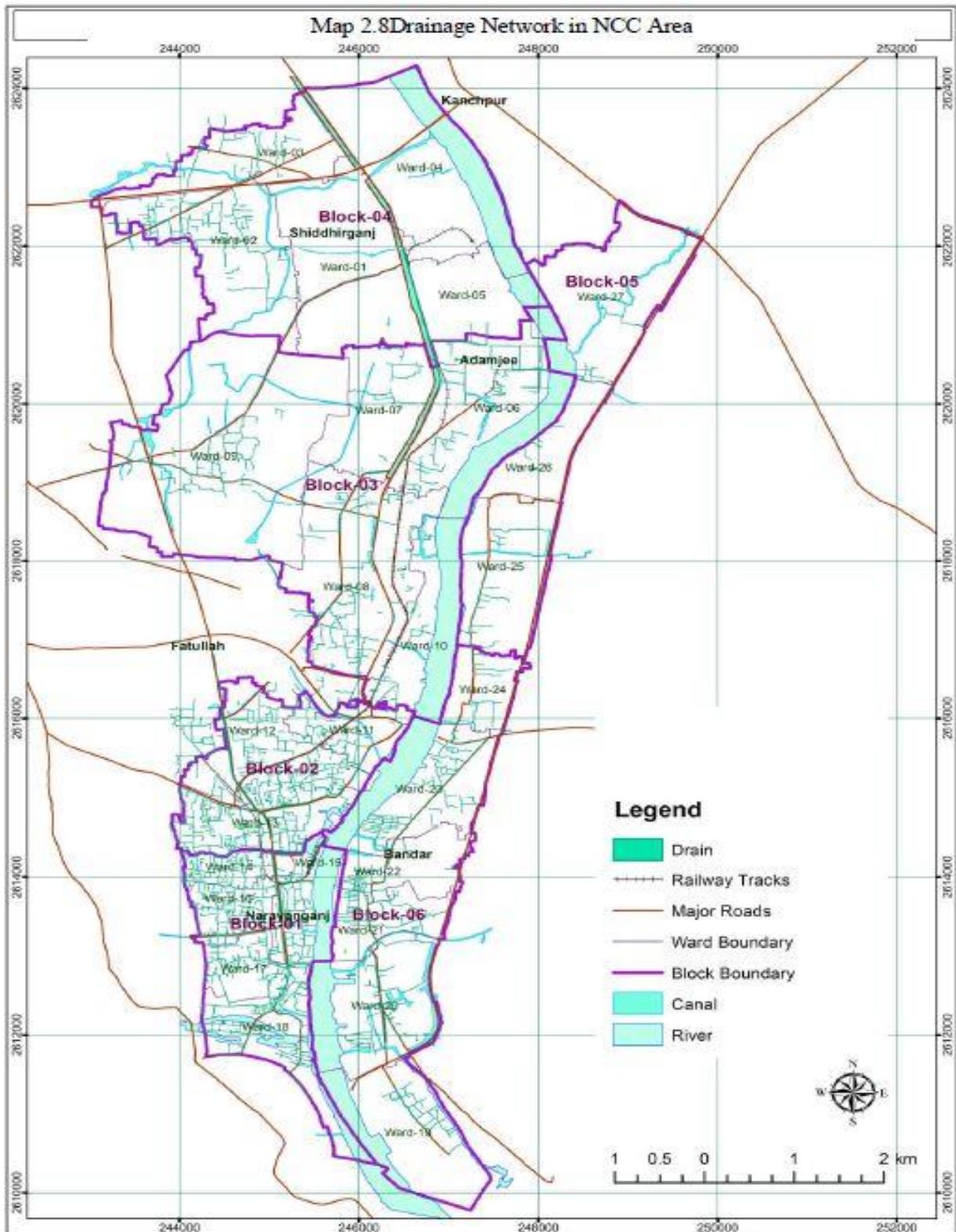
As per detail Geological, Hydrogeological study including water quality test, it is found that the working area of Narayanganj is really very Safe in terms of safe water options. Shallow tube-well water is highly contaminated by salinity. No deep aquifer is found.

**Source: This Surface - Ground Water Evaluation Study is made possible by the generous support of the American people through the United States Agency for International Development (USAID). The contents are the responsibility of World Vision Bangladesh and do not necessarily reflect the views of USAID or the United States Government.**

**6.7 NATURAL ENVIRONMENTAL ISSUES**

**□ Geology**

Geologically NCC area is located on the edge of the Madhupur Tract and the Holocene floodplain deposits from the aquifers. Geologically it is a terrace from one to ten meters above the adjacent floodplains. Though in its present form it is of Pleistocene age, its origin may be in the late Miocene, when the Bengal Basin was being filled in rapidly. Unlike the Barind Tract it is largely in one piece, with seven small outliers. The major geographic units of the city are: the high land or terrace, the low land or floodplain, depressions and abandoned channels. . They are red or brown in color. In most places the changes from the floodplains to the Tract is quite sharp, but in some places the floodplain soils overlie the gently inclining edges. The Madhupur Tract is extensively dissected, with narrow or broad valleys extending deep into the level landscape and the Drainage pattern is clearly dendrites. The higher level lands are known as Chala and the valleys are called Baid. The valleys are cultivated with Boro rice in the dry season by impounding the streams for irrigation.



Source: Drainage Survey, 2016

## 6.8 CLIMATE AND TEMPERATURE

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Climate and temperature of NCC area is characterized by the warm, humid summers and cool and dry winters. However, generally the weather is sub-tropical, with a warm climate all year round. The annual average temperature varies maximum 36°C to minimum 12.7°C and the average annual rainfall is 2376 mm. Monthly precipitation records clearly show a distinct dry and rainy season in according to the statistics of the wind data from the Bangladesh Meteorological Department Climate Division, wind direction changes by month. Nevertheless, the northwest, south, and northeast winds are predominant. The construction works can be influenced by the climatic condition and meteorological components like humidity, temperature, sudden rainfall, and wind speed. During high winds, there might be possibility of quick spreading of the dust generated from the construction activities. It is very risky to work during rain and in high winds because the possibility of getting injury increases. Furthermore, work under high temperature and excess humidity is extremely difficult, and may create dehydration problem.

## 6.9 HYDROLOGY

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### 6.9.1 SURFACE WATER

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Over the last 150 years there were no major avulsions of the main rivers of Bangladesh. But declining and enlarging of the main rivers occur in a large-scale. The expansion of Narayanganj city was mainly in and around the river Sitalakhya. There are numbers of canals and water body in NCC area which play a vital role containing surface water in case of storm and rain water. Eastern part of the river Sitalakhya in Siddhirganj zone there are a lots of ponds which maintain the ecological balance of the area.

### 6.9.2 GROUNDWATER

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In Narayanganj City, ground water is a very essential source for drinking and other purposes in households and industry. Tube wells are situated nearly 50 to 320 m away from the disposal sites and people of adjacent houses are drinking the water regularly, which is not recommended due to the high

### 6.9.3 PROBABILITY OF GROUND WATER CONTAMINATION.

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The ground water basin is completely dependent on the ground water resources while all other sources of fresh water are almost dead or unusable. Recent days Bangladesh has prime concern to sustainably manage its ground water as it is tend to become scarce. In Narayanganj river basin area, surface water withdrawal from adjacent rivers is not a proved feasible option because of high levels of industrial and domestic pollution from unregulated waste disposal. Narayanganj city is dependent primarily on groundwater for the urban water supply. Presently Narayanganj Water and Sanitation Authority obtain drinking water from groundwater sources. Ground water of Narayanganj city has been drawn down significantly because of overexploitation and also the pressing demand from the urbanization and it is also evident that the rate of water-level drop in the city area is about 2.5 m/year in the recent years.

#### 6.9.4 Aquifer and aquifer properties

The Basin area is characterized by Quaternary alluvial sequences of the Madhupur tract, which is an elevated Pleistocene terrace that surrounds floodplains of the Jamuna, Ganges and Meghna rivers. The primary aquifer of Narayanganj City consists of unconsolidated sediments of the Dupitila Formation, which are overlain by the Madhupur clay, an approximately 48-m-thick Aquitard. Though, aquifers are relatively homogenous in respect of aquifer properties and materials.

Layers	Average Thickness (meter)	Depth (meter)
Top soil	3	0-3
Aquitard - 1	11	3-14
Upper Dupitila Aquifer 1	23	14-37
Aquitard - 2	21	37-58
Upper Dupitila Aquifer 2	97	58-155
Aquitard - 3	16	155-171
Lower Dupitila Aquifer 1	57	171-228
Aquitard - 4	16	228-244

### 6.10 MUNICIPAL SERVICES

#### 6.10.1 2.7.1 WATER SUPPLY

Dhaka WASA and DPHE both are working jointly for water supply and sanitation in NCC area. WASA operates in Narayanganj core area and in Kadam Rasul (Block-01, 02, 04, 05, 06) except Siddhirganj (Block-03) through pipe line. In Narayanganj there are 2 water treatment plants located in Sonakanda and Godnail, 8 over head tanks and 30 pump houses. According to BBS 2011, about 51.29% of households depend on piped water, rest of the household depend on tube well or other available sources. DPHE is responsible in the areas of outside of WASA jurisdiction area. The number of subscribers of Narayanganj WASA is 11,636. There are 434 roadside water taps in Narayanganj. DPHE operates water supply by providing deep tube well, hand tube well, shallow tube well etc. also working by providing sanitary pit latrine. Perception of the inhabitants of the city regarding the quality of water generally is good. But in dry season the scenario become changed. The affected areas of the city are Don Chamber, Khanpur, Missionpara, Deobhog, Netaiganj, Jamtala and Masdair. Some of city dwellers alleged that water supplied by the WASA was not drinkable at all as it was stinky and had turned yellowish especially in dry season.

#### 6.10.2 SANITATION AND SEWERAGE

There is no formal sewerage disposal system in NCC area. About 11.50% household in NCC had no sanitary facilities. Governments and city leaders tend to favor conventional sewerage systems. Its advantages are lower cost and disadvantages are maintenance and downstream sewerage and treatment. Generally high dense low-income housing areas exploit the environment as it is in conjunction with surface drains. These systems are technically and organizationally difficult to

operate, and they rarely benefit the poor. Poorly planned and operated conventional sewerage damages the environment and misses the opportunity to recycle valuable nutrients and organics. There is also lack of manpower in the monitoring and supervision of construction of public toilets. NCC proposed to increase the number of work assistants to improve the conditions. Monitoring of public toilets managed by the private sector, such as toilets in markets and other facilities, is also another issue.

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### 6.10.3 ELECTRICITY SUPPLY

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The Siddhirganj Power Station, capacity 210 MW diesel fired having 96 numbers Caterpillar Generator sets of 1.2 MW capacities each and the Haripur Power Station, capacity 360 MW natural gas fired these two are the major generation units of the country and providing electricity all over Narayanganj city area. BPDC is providing electricity extensively all over Narayanganj except remote and rural areas. About 98.73% of households have electricity connection. The electricity is transmitted through poles above ground and in places through underground. DPDC has 1040 numbers of distribution transformers and 139 numbers of High-volt Electric Towers in different location of NCC area. Although almost every household in NCC core area have the electricity connection but inhabitants of city face irregular load shedding problem. According to DPDC senior officials, the electricity demand of Narayanganj city is 160 Mega Watts (MW), whereas it was receiving around 110 MW as per rational allocation set earlier. To increase the supply in Narayanganj city, DPDC had to curtail power supply in Dhaka city and the adjoining areas, to meet the present demand.

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### 6.10.4 GAS SUPPLY

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Piped gas supply is available in the city and its surrounding area provided by Titas Gas Transmission & Distribution Company Limited except partial in Block 3 and block 5. Titas gas supply in Narayanganj being used round the year for generator, captive power generation both in public and private sector, CNG filling stations, industry and re-rolling mills, household for cooking purpose, commercial sectors. It mentioned that TGTDC first started commercial operation with the commissioning of a gas supply line to Siddhirganj Thermal Power Station. Gas supply is now available in all the important urban areas and industrial belt of the Narayanganj core area and adjoining area, also covers partially in Kadam Rasul area. According to the local representative of TGTDC smooth gas supply is hampering due to the system loss and authority is being affecting by losing a significant amount of revenue earning every year. It is

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### 6.10.5 SOLID WASTE MANAGEMENT

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Solid waste generation within NCC area has been calculated and it is about 0.42 kg/day (2016). The Narayanganj city generates total about 350 tons of garbage every day containing industrial waste, residential waste like food, vegetables, fruits, polyethylene, paper and cloths et cetera. The city corporation authority has the capacity to collect total about 290 tons of garbage every day. The waste collection rate is estimated about 83% in a day and the rest of the garbage is disposed on the landfills and left are unattended or locally dumped on the riverside or canals which results serious environmental degradation and public-health risk to the local inhabitants.

In NCC area Block-03, 04 and 06 have higher waste generation rate which is about 22% (NCC,2016) where solid waste management system need to be incorporate to solve existing problem urgently.

**6.11 AIR QUALITY**

As there are no major industries in Shiddhirganj, Narayanganj, Narayanganj the main sources of air pollution are vehicles and non-point sources such as open burning. There are currently no air quality monitoring stations are in operation within the project limit. The baseline air quality will be measured by the project contractors prior to commencement of work. The results will be provided in the updated EIA and all other measurements during implementation will be reported as part of EMP implementation. No information is available on local air quality from secondary sources. Population density within the subproject area of the Upazila is high and there are many motor vehicles operating on the subproject roads and other roads within the Upazila. It is expected that the subproject will not cause significant deterioration of air quality in the area. Close vegetation is observed in and around the project area. Prior to construction activities, subproject contractors will conduct air quality and noise level measurements as baseline. During construction, contractors will be required to conduct air quality measurements and ensure that the subproject does not cause deterioration of ambient air quality and impair noise level of surrounding environment. This is included in the environmental management plan hereof

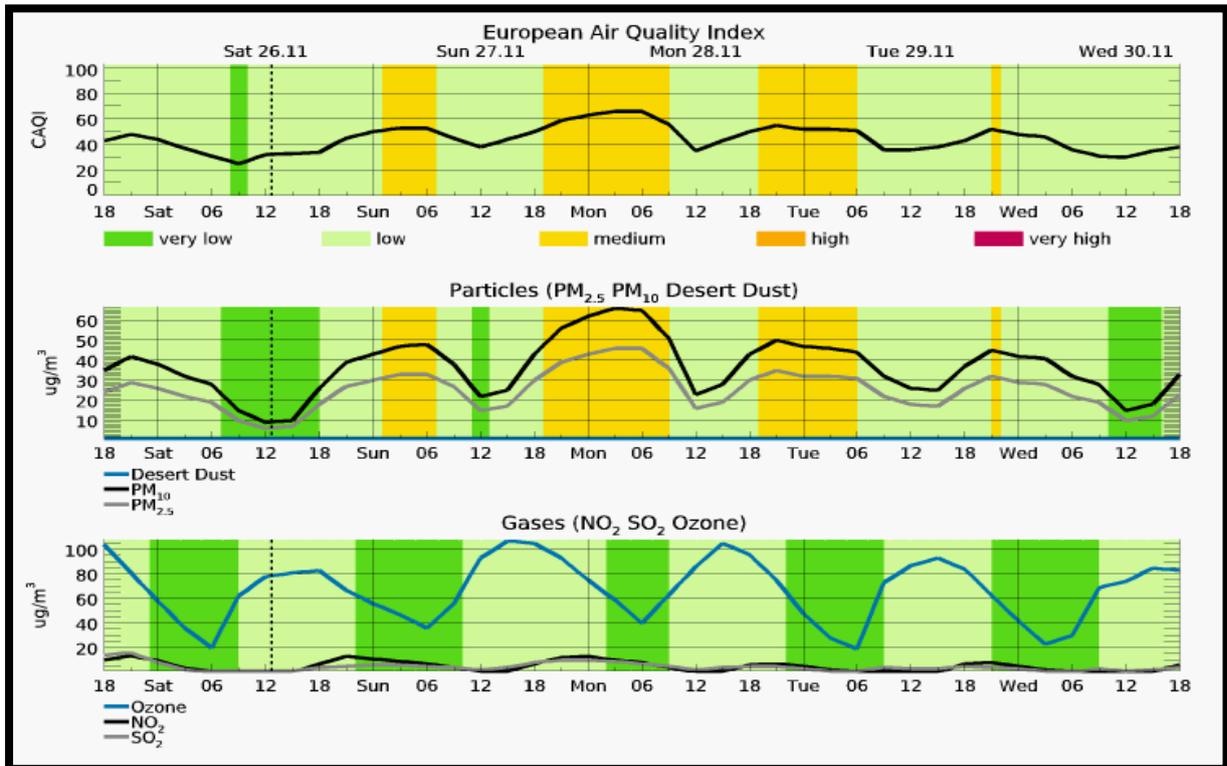


FIGURE 6-11 AMBIENT AIR QUALITY OF SHIDDHIRGANJ, NARAYANGANJ, NARAYANGANJ

## 6.12 ACOUSTIC ENVIRONMENT

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Vehicular movement can be considered as major cause of noise pollution. However, the volume of traffic that passes through these sections is not significant and traffic jams are not frequent. The baseline noise level will be measured by the sub-project contractors prior to commencement of work. The results will be provided in the updated EIA and all other measurements during implementation will be reported as part of EMP implementation.

## 6.13 ECOLOGICAL BASELINE

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### 6.13.1 INTRODUCTION

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The ecological baseline is the ecological value of a site before construction works are undertaken. It can be compared to the ecological value of the site after construction works are complete to determine where there have been changes. The survey of the ecological status is the first step of the implementation. This study has two main outputs: In one hand it is a baseline for the monitoring of the ecological result of the project. In the other hand it provides data for the Environmental Impact Assessment (EIA).

The survey covers the whole target area from the Terrestre habitats to the water body, including either the Hungarian or the Croatian side regarding to the fact that the habitats are divided only by the state border.

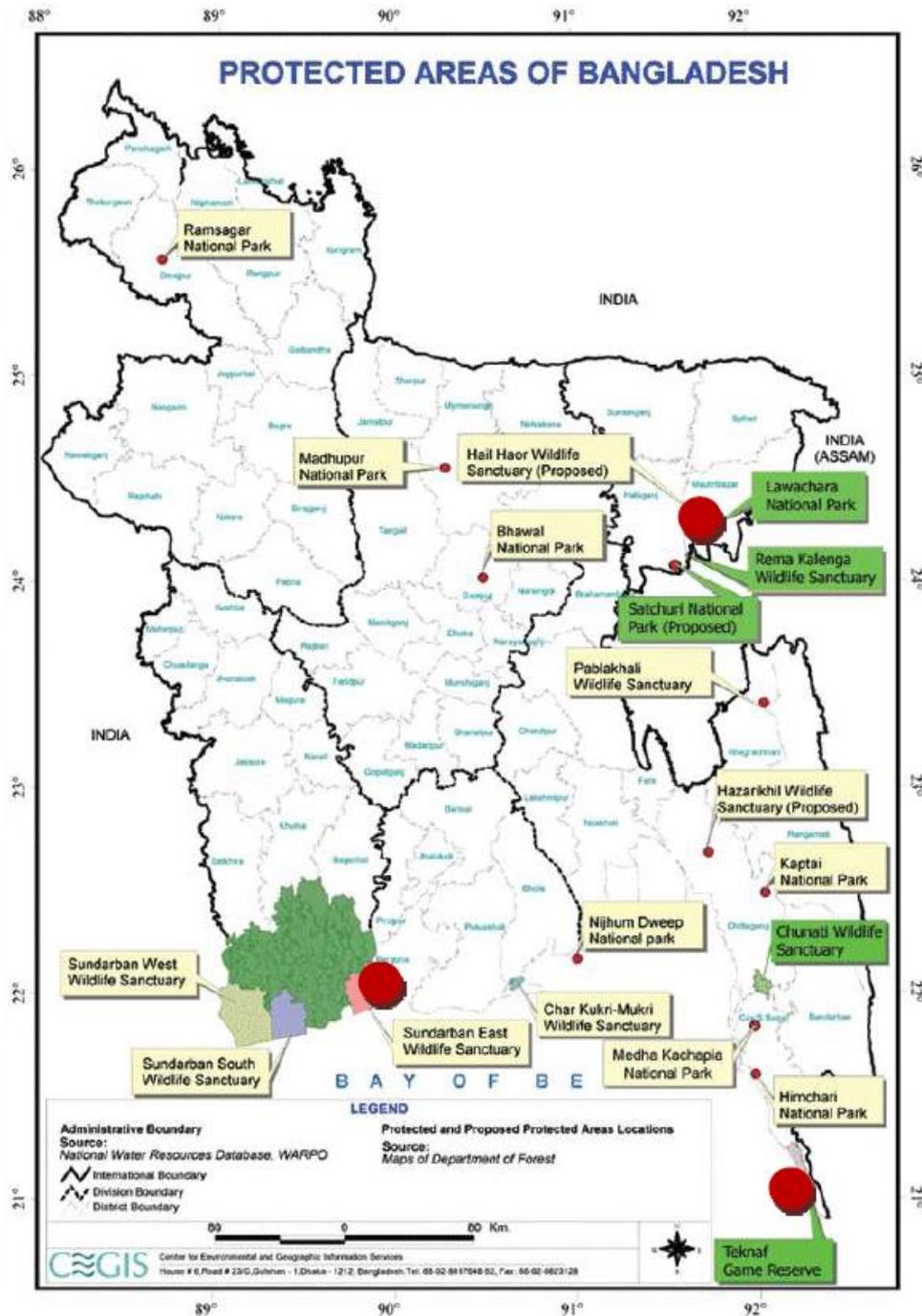


FIGURE 6-12 PROTECTED AREAS OF BANGLADESH

## 6.14 ECOLOGICAL AND CONSERVATION DESIGNATIONS

### 6.14.1 OVERVIEW

There are 19 protected areas in Bangladesh, covering 2,458 sq. km and representing 1.68% of the land area (FD record as on July 2007). The Forest Department has the mandate for the

management of these protected areas. The protected areas are declared in the country under the “Bangladesh Wildlife (Preservation) (Amendment) Act, 1974”. The protected areas are divided into following categories-

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#### 6.14.2 NATIONAL PARKS

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National Park is a relatively large area of scenic and natural beauty created for the preservation of scenery, flora, and fauna in a natural state to which access of the public for recreation and educational and research purposes is allowed. There are 10 national parks available in our country.

**No National Parks are located near the project site.**

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#### 6.14.3 WILDLIFE SANCTUARY

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Wildlife Sanctuary is an area closed to hunting, shooting or trapping of wild animals and maintained undisturbed for breeding of wildlife and vegetation, soil and water is protected from public interference. There are 8 wildlife sanctuaries present.

**No Wildlife Sanctuary is located near the project site.**

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#### 6.14.4 GAME RESERVES

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Game Reserves are created for protection of wildlife and increasing their number were capturing of wild animals is unlawful. There is only one game reserve present in our country named Teknaf Game Reserve, Cox’s Bazar which area is 11,615 ha. and notified on 1983.

**No Game Reserve is located near the project site.**

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#### 6.14.5 ECOLOGICALLY CRITICAL AREA

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An Ecologically Critical Area (ECA) is an environmental protection zone in Bangladesh. In 1995, specific areas in Bangladesh could be deemed Ecologically Critical Areas as a result of the Environmental Conservation Act.

Bangladesh has a wide variety of ecosystems that include over 300 rivers that creates marine and fresh water environments. There are a multitude of areas that have been considered ECAs. Cox's Bazar is on the border of Bangladesh and Myanmar in the southeast corner of Bangladesh. The Teknaf Peninsula is 80 km of sandy beach and holds a variety of species as one of the longest beaches in the world. The Sonadia Islands are home to some of the last mangrove forests that house distinct species that can tolerate the high salinity of the mangrove forests in this area. The Sundarbans also contain mangrove forests and was named an ECA because it continues to suffer from over-exploitation and illegal urban development. St. Martin's Island is known for its coral-algal that overwhelms its rocky reefs. The island is a refuge for globally threatened marine species. Finally, the Hakaluki Haor found in greater Sylhet is an ECA because it has an extensive amount of wetland habitats that support a wide variety of life.

Gulshan-Baridhara Lake was declared an ECA in 2001. In September 2009, the four rivers around the capital city Dhaka—Buriganga River, Shitalakshya River, Turag River and Balu River—have been declared by the Department of Environment as ECAs.

**The project site does not locate in any Ecologically Critical Area.**

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#### 6.14.6 ECO PARK

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Eco Park a short form of Ecological Park. It is exploited as an amusement park without hampering its natural environment so that the bio-diversity remains unaffected there. Generally, a particular area of a forest is demarcated and brought under intensive management for this purpose. Sometimes forest areas having special natural features are selected as eco parks. Flora of the concerned area gets preference for such consideration. However, protection and preservation of both flora and fauna get top priority. Beauty offered by the nature is opened to the visitors. Moreover, efforts to attract and entertain the visitors are also visible in the Eco parks.

Eco Park is not only a mere component of forest management. It facilitates to enjoy the beauty of the jungles as well as to acquire firsthand knowledge on its ecology, particularly the growth and development of flora and fauna. Eco Park also helps to increase public awareness about the necessity of maintaining bio-diversity. The Department of forest has set up nine eco parks throughout Bangladesh considering their natural beauty and specific features like geographical location.

**The project site does not locate in any Eco Park Area.**

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### 6.15 TERRESTRIAL ECOLOGY

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#### 6.15.1 FLORA

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The project site falls within the “IUCN Bangladesh” designated ‘Bio-Ecological zone: Zone-8b-Coastal Plains’ which have undergone significant reduction in faunal diversity in recent times (Nishat et. al, 2002). The Coastal Plains is rich in bio-diversity. This Coastal Plains is characterized by mixed vegetation. Homestead forests, on the other hand, include both cultivated and wild plant species. The dominant floral types are: Narikel (*Cocos nucifera*), Supari (*Areca catechu*), Khejur (*Phoenix sylvestris*), Bhadi (*Lannea coromandelica*). The common Shrubs and Herbs are Bashak (*Adhatoda vasica*), Paresh (*Thespesia populnea*), Ulu (*Imperata cylindrica*), Hargoza (*Acanthus illicifolius*).

Nearly all the major groups of the oriental birds are represented in this zone by one or more species. Dominant species of birds seen are Ashy bulbul (*Hemixos flavala*), Gull-billed tern (*Gelochelidon nilotica*), Spot-throated babbler (*Pellorneum albiventre*), Asian glossy starling (*Aplonis panayensis*).

Among the Reptiles Slender coral snake (*Callophis melanurus*), Green pit viper (*Trimeresurus gramineus*), Banded krait (*Bungarus fasciatus*), Ring lizard (*Varanus salvator* are widely available. The amphibian species found in this zone include Ornate microhylid (*Microhyla ornata*), Bull frog (*Hoplobatrachus tigerinus*) (Nishat et al., 2002).

Sl. No.	Local Name	Status	Sl. No.	Local Name	Status
1	Tezpata	Common	12	Narikel	Common
2	Amgas	Common	13	Jambura	F. Common
3	Kathal	Common	14	Tetul	F. Common
4	Supari	Common	15	Lukluki	F. Common
5	Lichu	Common	16	Jalpai	Rare
6	Khezur	Common	17	Tal	Rare
7	Satni	Common	18	Kamla	Rare
8	Kalagas	Common	19	Anarosh	Rare
9	Lebu	Common			
10	Bel	Common			
11	Peara	Common			

### 6.15.2 FAUNA

The big deer sambar and the small barking deer (*Muntiacus mungjak*) are found in the forests of Shiddhirganj, Narayanganj, Narayanganj. Elephants (*Elephas maximus*) are also seen in these forests. Jungle cat (*Felis chaus*) and fishing cat (*Felis viverrina*) are common; the beautiful clouded leopard (*Panthera Pardus*) and cats are also found. Wild boar (*Sus Scrofa*), wild dog, jackals (*Canis aureus*), fox (*Vulpes bengalensis*), weasals, honey badger (*Arctonyx collaris*), hog badger and scaly anteaters are also found. Rodents are represented by different species of squirrel (*Funambulus pennanti*), rat (*Rattus rattus*).

Shiddhirganj, Narayanganj, Narayanganj has very rich avifauna. It supports large number of birds with its rich rainforests. Most of the 600 species of birds that are found in Bangladesh are also seen in Shiddhirganj, Narayanganj, Narayanganj except the marine and the shore birds.

Sl No	Species	Local Name	Status	Sl No	Species	Local Name	Status
1	Reptiles	Anjila	Common	16	Birds	Choroi	Common
2		DhuraShap	Common	17		Doyel	Common
3		MatiaShap	Common	18		Kak	Common
4		Tiktiki	Common	19		Bagari	Common
5		Kari Katta	Common	20		Ghughu	Common
6		DaraishShap	Common	21		Shalik	Common
7		Gokhra	F.Common	22		Kokil	Common
8		Kassap	F. Common	23		Bok	Common
9		GuiShap	Rare	24		Tuntuni	Common
10	Mammals	Babur	Common	25		Badur	Common
11		Idur	Common	26		Chil	Common
12		Shial	Common	27		Machranga	F.Common n

13		Chika	Common	28		Tota	F.Commo n
14		Bagdash	Common	29		Haludakhi	F.Commo n
15		Khekshial .	F. Common	30		Katthokra	F.Commo n
Source: Field survey database; F=Fairly				31		Pecha	Rare
				32		Shakun	Rare
				33		Tia	Rare

### 6.16 SEISMICITY

Bangladesh, a densely populated country in South Asia, is located in the north-eastern part of the Indian sub-continent at the head of the Bay of Bengal. Tectonically, Bangladesh lies in the north-eastern Indian plate near the edge of the Indian carton and at the junction of three tectonic plates—the Indian plate, the Eurasian plate, and the Burmese microplate. These form two boundaries where plates converge—the India-Eurasia plate boundary to the north forming the Himalaya Arc and the India-Burma plate boundary to the east forming the Burma Arc.

Active faults of regional scale capable of generating moderate to great earthquakes are present in and around Bangladesh. These include the Dauki fault, about 300km long trending east-west and located along the southern edge of Shillong Plateau (Meghalaya- Bangladesh border), the 150 km long Madhupur fault trending north-south situated between Madhupur Tract and Jamuna flood plain, Assam-Sylhet fault, about 300km long trending northeast-southwest located in the southern Surma basin and the Chittagong-Myanmar plate boundary fault, about 800km long runs parallel to Chittagong-Myanmar coast.

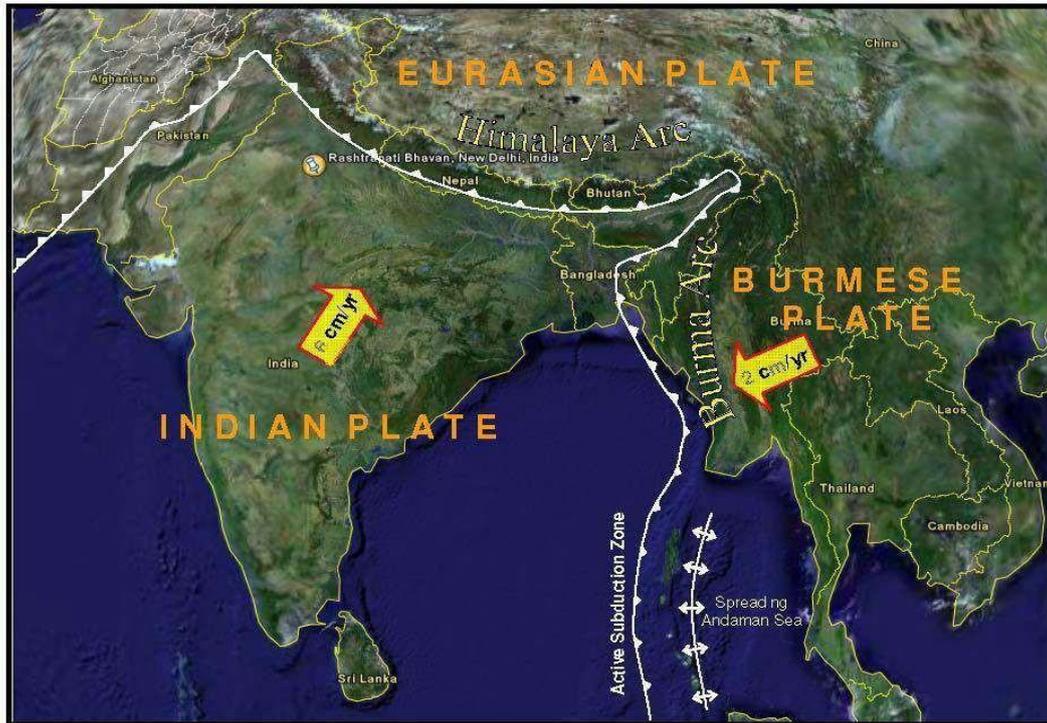


FIGURE 6-13 REGIONAL TECTONIC SETUP OF BANGLADESH WITH RESPECT TO PLATE CONFIGURATION

Based on earthquake epicenters and morpho-tectonic characteristics, Bangladesh is divided into three seismic zones, namely zone-I, zone-2, and zone-3 (Table 4.15). The northeastern folded regions of Bangladesh are the most active zone and it belongs to zone-I. Zone-II consists of recent uplifted Pleistocene blocks of the Barind and Madhupur Tract and the western extension of the folded belt. Southwest Bangladesh is referred to as zone-III and it is a seismically quiet zone. The Bask coefficients of these three zones are 0.08, 0.05, and 0.04, respectively.

TABLE 6-7 SEISMIC ZONES OF BANGLADESH

Zoning	Area Mercalli Scale
I	North and eastern regions of Bangladesh (Seismically most active)
II	Lalmái, Barind, Madhupur Tracts, Dhaka, Comilla, Noakhali, and western part of Chattogram Folded belt.
III	Narayanganj division S-E Bangladesh (Seismically relatively quiet)

The factory will be located in Zone-III of earthquake zones (Figure 6.12) which is a seismically moderate risk zone. During seismic or earthquake delineation, ground condition (firm or soft) has not been taken into consideration in Bangladesh. Though the project is located within zone- II special precaution is needed in considering the risk from earthquakes.

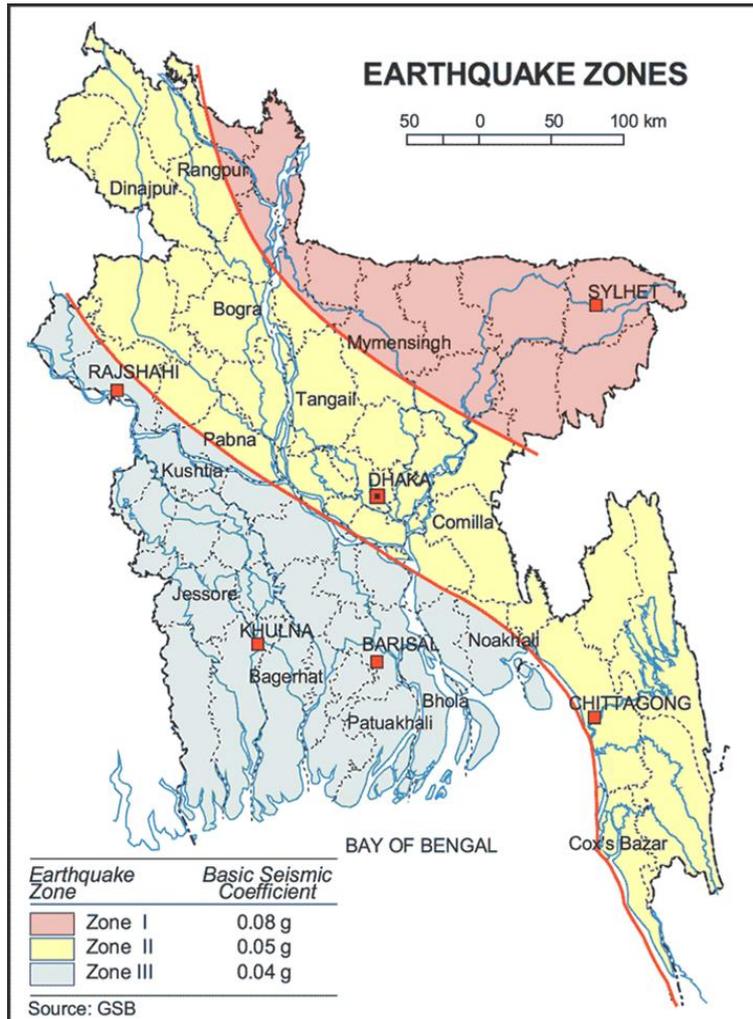


FIGURE 6-14 EARTHQUAKE ZONES OF BANGLADESH

## 6.17 SHITALAKHYA RIVER

### 6.17.1 SHITALAKHYA RIVER

Shitalakhya river is a distributary of the Brahmaputra river. It remains navigable round the year. For monitoring water quality, samples were collected from three different locations viz. Demra Ghat, Ghorasal Fertilizer Factory (GFF) and near ACI factory at Narayanganj.

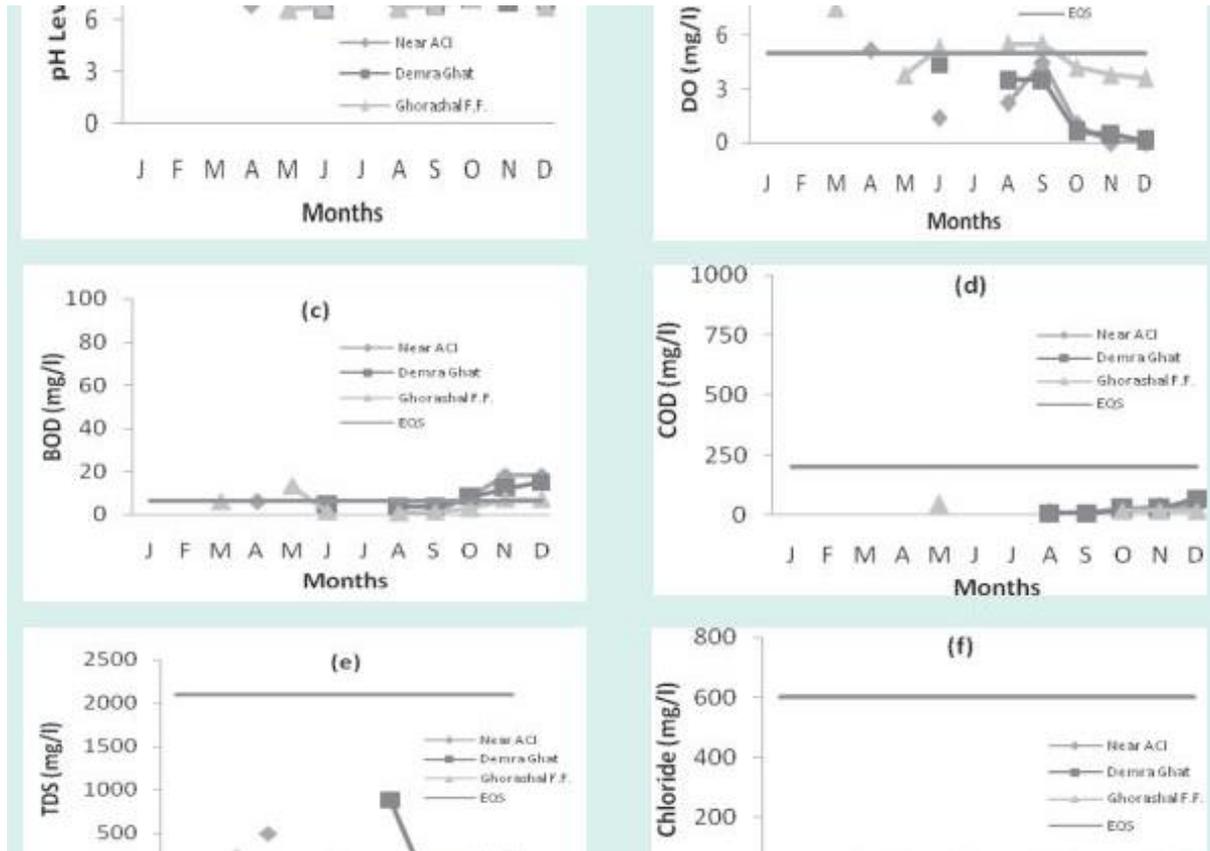


FIGURE 6-15 GRAPHICAL PRESENTATION OF PH, DO, BOD, TDS, CHLORIDE AND TURBIDITY OF SHITALAKHYA RIVER

Fig.2. Graphical presentation of pH, DO, BOD, COD, TDS and Chloride of Shitalakhya River in 2015. In 2015, pH of Shitalakhya river water was within the EQS (6.5-8.5) range for inland surface water. The maximum pH was 7.97 in March and the minimum PH was 6.66 in May at Ghorasal Fertilizer Factory (G.F.F) respectively (Fig.2a). In 2014, pH varied from 6.8 to 7.8. In 2015, the maximum DO (5.5 mg/l) was found at G.F.F in August and the minimum (0.0 mg/l) was found near ACI factory in November and December (Fig.2b). In 2014, DO varied from 0.0 to 5.6 mg/l. In 2015, BOD at Demra Ghat was very high during dry period. Near Ghorasal Fertilizer Factory BOD was within the EQS (<6 mg/l) for fisheries in May and June. Highest value of BOD (18 mg/l) was found near ACI Factory in December and lowest (0.8 mg/l) was in August near G.F.F point (Fig.2c). In 2014, BOD concentration varied from 0.0 mg/l to 32 mg/l. In 2015, COD level was within the EQS (200 mg/l) for wastewater after treatment from industrial units at all locations of Shitalakhya river. The maximum COD (69.28 mg/l) was at Demra Ghat in December and the minimum COD (7.25 mg/l) was at Damra Ghat in September (Fig.2d). In 2014, COD level varied from 4.0 mg/l to 141 mg/l. TDS of Shitalakhya river varied from 48.5 to 484.2 mg/l against the EQS (2100 mg/l) for wastewater after treatment from industrial units. In dry season maximum TDS (484.2 mg/l) was at Damra Ghat and the minimum (48.5 mg/l) in September near G.F.F (Fig.2e). In 2014, TDS range was 70.6 to 668 mg/l. Chloride concentration of the Shitalakhya river in 2015 was below the EQS (600 mg/l) for wastewater after treatment from industrial units. The maximum Chloride (35.98 mg/l) was found at Damra Ghat in December and the minimum was 4.0 mg/l near G.F.F in September, 2015 (Fig.-2f). In 2014, Chloride concentration varied from 3.1

mg/l to 44 mg/l.

TABLE 6-8 SUSPENDED SOLID (SS) OF SHITALAKHYA RIVER WATER

Sampling Locations	SS (mg/l)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Narayanganj (Near ACI)	-	-	-	32	-	<b>76</b>	-	36	10	48	24	24
Demra Ghat	-	-	-	-	-	34	-	27	27	24	36	18
Ghorashal Fertilizer Factory (GFF)	-	-	12	-	32	47	-	26	<b>12</b>	54	33	28
<b>EQS for wastewater after treatment from industrial units 150 mg/l</b>												

*Source: water quality report department of Environment*

SS of Shitalakhya river water at different sampling locations was within the EQS (150 mg/l). Maximum SS concentration of Shitalakhya river was 76 mg/l near ACI Factory in June and minimum 12 mg/l in September at the same location (Table-4).

TABLE 6-9 ELECTRICAL CONDUCTIVITY (EC) OF SHITALAKHYA RIVER WATER

Sampling Locations	EC (µmhos/cm)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Narayanganj (Near ACI)	-	-	-	<b>930</b>	-	175.9	-	135	112.9	254	288	288
Demra Ghat	-	-	-	-	-	<b>108.4</b>	-	190.7	190.7	241	304	310
Ghorashal Fertilizer Factory (GFF)	-	-	434	-	142.4	127.6	-	118.2	161.1	301	296	374
<b>EQS for wastewater after treatment from industrial units 1200 µmhos/cm</b>												

*Source: water quality report department of Environment*

EC of Shitalakhya river at different locations was mostly within the EQS (1200 µmhos/cm) for treated wastewater from industrial units (Table-5) except in the month of April. The maximum EC (930 µmhos/cm) was near ACI factory in April and the minimum EC (108.4 µmho/cm) was at Demra Ghat in June.

TABLE 6-10 TOTAL ALKALINITY OF SHITALAKHYA RIVER WATER

*Source: water quality report department of Environment*

Sampling Locations	Total Alkalinity (mg/l)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Narayanganj (Near ACI)	-	-	-	80	-	36	-	64	52	60	100	100
Demra Ghat	-	-	-	-	-	<b>32</b>	-	60	60	72	140	120
Ghorashal Fertilizer Factory (GFF)	-	-	<b>170</b>	-	40	40	-	38	44	84	70	70
<b>EQS for wastewater after treatment from industrial units 150 mg/l</b>												

Maximum T. Alkalinity (170 mg/l) was near Ghorasal Fertilizer Factory in March and that of minimum was (32 mg/l) at Demra Ghat in June.

Source: Geospatial model result, 2018

## 6.18 SOCIO-ECONOMIC CONDITION

### 6.18.1 GEOGRAPHIC AREA AND LOCATION

Shiddhirganj, Narayanganj, Narayanganj district is bounded on the north by Rangamati district, on the east by Rangamati district and Myanmar, on the south of Myanmar and on the west of Chittagong and Cox's Bazar districts. It lies between 21° 11" and 22° 22" north latitudes and between 92° 04" and 92° 41" east longitudes. The total area of the district is 4,479.03 sq. km (1729.36 sq miles) of which 2653.54 sq.km is under forest. The area of Shiddhirganj, Narayanganj, Narayanganj town is 51.80 sq.km.

### 6.18.2 DEMOGRAPHICS

Vulnerability to hazards not only relies on the extent of natural hazards but also depends on the social and economic conditions of the communities. Therefore, this study intends to construct a household-level social vulnerability at the microscale in the nine wards of Chalna Municipality (CM), Narayanganj, in southwest coastal Bangladesh by employing the social vulnerability index (SoVI). We surveyed 30 households from each ward to collect data on 33 vulnerability indicators. Of these, seven indicators were extracted by principal component analysis (PCA), which explained 96.34% of the total variance. The PCA results indicate that high population density, poor economic condition, the presence of vulnerable groups, unstable income generating sources, unplanned urban and poor infrastructure, lack of services, and lack of adequate sewage systems are the key drivers of social vulnerability of the CM. The SoVI score was generated using seven PCA outcomes for the respective wards. Results revealed that 44.45% of the areas are medium-high to high (wards 2, 4, 5, and 6) vulnerable. The highest level of social vulnerability was distributed in ward 5, while ward 8 was identified as the least vulnerable. About 33.33% of the CM was found as medium vulnerable areas (wards 1, 7, and 9). Ward 3 was categorized as a low-medium vulnerable area. The findings of the study will provide useful information for decision-makers and disaster managers to develop sustainable disaster management plans for coastal Bangladesh to reduce social vulnerability as well as to decrease the impacts of natural disasters beautiful destination.

### 6.18.3 LAND USE

The study of the land use pattern is based on extensive physical survey which was accomplished through GPS system.

TABLE 6-11 THE MAJOR AGRICULTURE PRODUCTS AND THE LAND USED FOR THE PRODUCTION IN SHIDHIRGANJ, NARAYANGANJ, NARAYANGANJ DISTRICT.

Production of Agriculture Product and Used area
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Serial no	Name of Items	Area(acre)	Production (Metric Ton)
1.	Fish Catch	539	299
2.	Onion	66	64
3.	Rice	44,344	50,057
4.	Eggs(pcs)		360,169
5.	Milk		52
6.	Pulse	307	128
7.	Vegetable	4143	6212
8.	Sweet Meat	2	211

Source: Zila profile of Narayanganj, Narayanganj; Bangladesh Bureau of Statistics. 2007

#### 6.18.4 LITERACY

Shiddhirganj, Narayanganj, Narayanganj Sadar has an average literacy rate of 60.8% (7+ years), and the national average of 32.4% literate. (BBS, 2011).

#### 6.18.5 CULTURAL

The city got its name from Bicon Lal Pandey, a Hindu religious leader who was also known as Benur Thakur or 'Lakshmi Narayan Thakur'. He leased the area from the British East India Company in 1766 following the Battle of Plassey. He donated the markets and the land on the banks of the river as Devottor or 'Given to God' property, bequeathed for maintenance expenses for the worship of the god Narayan. A post office was set up in 1866, and Dhaka-Narayanganj telegraph service was started in 1877. The Bank of Bengal introduced the first telephone service in 1882.

#### 6.18.6 ROADS, EXISTING PROVISIONS FOR PEDESTRIANS, AND TRANSPORT-RELATED FACILITIES

Rickshaws are the most popular means of public transport in Narayanganj for short trips, and auto rickshaws are also common. Narayanganj has two railway stations named Chashara railway station and Narayanganj railway station. From Dhaka anyone can use three roads to enter the city: Dhaka–Narayanganj old road, Dhaka–Narayanganj link road and Narayanganj–Demra road. The BRTC AC Bus gives bus transport service from Narayanganj to Dhaka.

#### 6.18.7 ECONOMIC SITUATION

Narayanganj is the industrial zone in Bangladesh, after Dhaka and Chittagong. It is the administrative center of Narayanganj District and Narayanganj Division. Narayanganj's economy is the third-largest in Bangladesh, contributing \$53 billion in gross state product and \$95 billion in purchasing power parity (PPP) in 2020. In the 2022 census, the city had a population of 718,735..

## CHAPTER 7 POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

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### 7.1 GENERAL

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Anticipated environmental impacts associated with the proposed project activity of the unit have been identified in this study. Various activities during the construction and operation phase of the project, which are likely to cause an impact on various environmental components, have been listed.

For evaluation of impacts due to proposed activities of the unit, the baseline data generated for environmental parameters presented in chapter-4 of this report has been utilized. Changes in the environmental parameters and their impact whether short term or long term, positive or negative are identified & predicted as well as reversible nature of impacts are described in this chapter.

For identification, prediction, and quantification of the impacts due to the proposed project, an assessment task is performed for both Construction as well as Operation stages. All possible care to maximum extent is taken for assessment of temporary, short term, long term, direct, indirect as well as reversible and irreversible in nature of impacts. It is also borne in mind that the impact caused by activities of the construction phase will be temporary and restricted to a period of construction of the project. In this chapter, the effect due to construction & Operational activity of the proposed project is explained. Finally, the description in tabular form which is commonly known as the “Impact matrix” is illustrated.

During this assessment, it is revealed that implementing proper Management measures for all major predicted impacts, can be eliminated or can be minimized to a negligible extent of damage /hazard to the environment.

### 7.2 ENVIRONMENTAL SENSITIVITY INVESTIGATION

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The proposed project area is not environmentally sensitive due to its geographical location. All the environmentally sensitive issues were investigated by a selected consultant’s group through carrying out primary and secondary data analysis. The main hindrances of the proposed project sustainability are natural calamities like cyclones, floods, etc. Design consultants should consider this sensitive issue in the design structure to make the project environmentally sound and sustainable. The structure should be maintained at an adequate height to protect from cyclones, earthquakes, landslides, etc. A disaster management plan has to be developed by the project proponent to protect from natural calamities.

#### 7.2.1 NATURAL HAZARD

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A vulnerability map gives the precise location of sites where people, the natural environment, or property are at risk due to a potentially catastrophic event, often induced by climate change, which could result in death, injury, pollution, or other destruction. Such maps are made in conjunction

with information about different types of risks. It could delineate the commercial, tourist, and residential zones that would be damaged in case of natural disaster.

Vulnerability mapping can allow for improved communication about risks and what is threatened. It allows for better visual presentations and an understanding of the risks and vulnerabilities so that decision-makers can see where resources are needed for the protection of these areas. The vulnerability maps will allow them to decide on mitigating measures to prevent or reduce loss of life, injury, and environmental consequences before a disaster occur. Those preparing the maps can overlap flood inundation and slope stability zones with property maps to determine which properties and buildings are at risk. They can then notify the landowners and inform them of government subsidies or other support available for undertaking a measure that would protect their homes from potential damage by, for example, water inundation or slope failure.

The following figure shows the vulnerability map of different hazards of Bangladesh. From the figure, it is understood that the study area is fall in storm surge affected area. Storm surges are generally caused due to cyclones. So, any infrastructure development in this area should be followed precaution to resist this event. It would help the decision-maker to take decisions during the design period.



FIGURE 7-1 HAZARD MAP OF BANGLADESH

**7.2.2 SEISMICITY**

Seismic structural strength assessment of existing buildings, strengthening of existing proposed foundation system and superstructures of critical structures, incorporation of liquefaction potential criteria in the structural design process for structures are a few of the considerations to be in mind. A preventive measure can be coordinated by ensuring anti-seismic design (end-bearing pile foundation including bored or driven piles and use reinforced concrete raft for shallow foundation), quality control (selection of adequate material and appropriate workmanship) under expert supervision. The project site lies in seismic zone II which is also called moderate intensity seismic zone with a basic seismic coefficient of 0.15g. Having a location in Zone-II the land buildings and land-based structures for this project should be designed to withstand the maximum lateral load of 50% of gravity load.

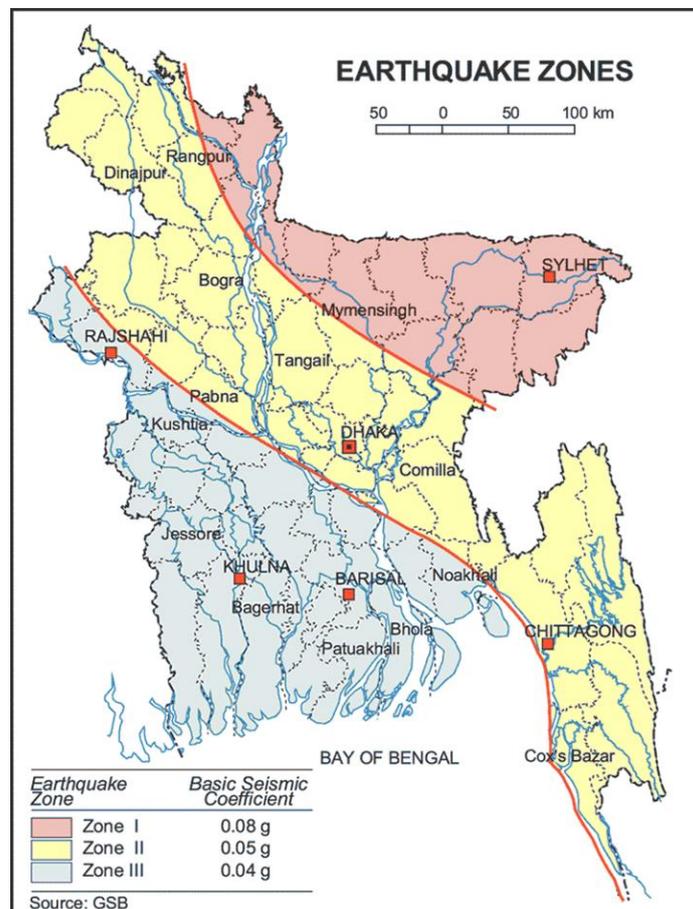


FIGURE 7-2 EARTHQUAKE ZONING MAP

**7.2.3 LANDSLIDE**

Shiddhirganj, Narayanganj, Narayanganj District has 348 landslides vulnerable locations. Among them, 6 are extremely vulnerable and 342 are highly vulnerable to landslides. About 91 percent of the landslides will occur flat. Ten landslide triggering factors including land use, rainfall, elevation, soil types, geology, distance to rivers, roads and stream orders, population density, income, education of the inhabitants were chosen as effective factors on a land in the area.

### 7.3 IDENTIFICATION OF POTENTIAL IMPACTS

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One of the important elements of Environmental Impact Assessment (EIA) is the identification of impacts, as it helps in quantification and evaluation of impacts. Although, in general, a number of impacts have been identified while describing the baseline environmental status, it is necessary at this stage to identify the critical impacts positive/negative on various components of the environment that are likely due to installation of **Midland Knitwear Limited**. Generally, the environmental impacts can be categorized as either primary or secondary. Primary impacts are attributed directly to project activities whereas secondary impacts are indirectly induced and typically include the associated investment and changed patterns of social and economic activities due to the proposed project activities. The construction and operational phase of the proposed **Midland Knitwear Limited** comprises various activities, each of which may have either positive or negative impact on some or other environmental attributes. The proposed project activities would impart impact on the environment in two distinct phases:

- During construction phase which may be regarded as temporary or short term and reversible effect; and
- During operational phase which may have long term effects.

The evaluation of environmental impacts due to installation of **Midland Knitwear Limited** considering the baseline status within a radius of 3 km around the proposed plant and the mitigation measures are as under:

### 7.4 IDENTIFICATION OF IMPACTING ACTIVITIES

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- I. Various activities involved in the proposed project are:
  - A. Construction phase activities
  - B. Operation phase activities
- II. The activities identified for the proposed project under each phase are:
  - A. Construction phase:**
    1. Excavation
    2. Foundation & Civil work
    3. Transportation of construction materials, equipment & machineries
    4. Construction of project.
  - B. Operation phase:**
    1. Handling and Transfer of Solid waste
    2. Movement of the Vehicle
    3. Operation of Project
    4. Sewage water Management

### 7.5 LIKELY BENEFICIAL IMPACTS

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The project will bring in much direct and indirect positive impact on the social wellbeing of the locality. The likely benefits from the construction and operation of the proposed development project are listed as below:

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## 7.5.1 CONSTRUCTION PHASE

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### 7.5.1.1 EMPLOYMENT OPPORTUNITY IN CONSTRUCTION AND SUPERVISION WORK

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Skilled and semi-skilled human resources will be used in the construction activities of the project which will generate the employment. The direct employment during the construction phase has been estimated to 60-70 (daily average basis) which will increase in income level.

The impact will be direct, high magnitude, site specific and short term; therefore, it will be significant in nature.

### 7.5.1.2 SKILL AND KNOWLEDGE DEVELOPMENT THROUGH TRAINING AND ORIENTATION

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The human resource involved in the project construction will gain experience and skills that enhances their capability in respective field which will increase in income generating activities and employment opportunities.

The impact will be direct, medium magnitude, local and long term; therefore, it will be significant in nature.

### 7.5.1.3 INCREASE IN ECONOMIC ACTIVITIES DUE TO SUPPLY OF GOODS AND SERVICES

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Different commercial activities will be increased in project area due to the construction works. Local suppliers will get an opportunity to supply construction materials like cement, steel, bar, gravel, sand etc. which definitely benefits the local market and help to boost the economic activities.

The envisaged direct impact is medium in magnitude, site specific in extent, and long term in duration and hence significant in nature.

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## 7.5.2 OPERATION PHASE

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### 7.5.2.1 EMPLOYMENT GENERATION AND PROMOTION

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A number of professionals will be involved in project to provide RMG services to the people. 115 peoples will get direct/indirect employment opportunity during the operation of project. Besides this, adjacent area of the project and many people will be engaged to provide other necessary facilities to the project visitors through opening of groceries or commodity stores and restaurants. This employment generation will increase the income of locals.

The envisaged direct impact is high in magnitude, local in extent, long term in duration and hence very significant in nature.

### 7.5.2.2 INCREASE IN REVENUE GENERATION

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With operation of project, revenue generation will be increased at district and upazilla level.

The envisaged direct impact is medium in magnitude, local in extent, long term in duration and therefore very significant in nature.

#### 7.5.2.3 PROMOTION OF LOCAL BUSINESS

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The project operation will increase the daily activities like, animal husbandry through food waste supply, vegetable and fruit supply to project, electronics and furniture supply, human resource enrollment, promotion of handicraft shops, vehicle hire services provider and so on within the premises of project. The demand of local goods, markets, food and other basic requirement certainly increases at the project site. The large number of visitors especially tourist from different countries and other staff will significantly increases the economic transaction in and around the vicinity, which will attract people to migrate around the area. This will lead to urbanization of the area and will improve the socio – economic status of the local people.

The envisaged direct impact is medium in magnitude, local in extent, long term in duration and hence significant in nature.

#### 7.5.2.4 CULTURAL EXCHANGE BETWEEN LOCALS AND TOURISTS

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To and flow of large number of visitors and other staff will significantly increase the economic transaction in and around the vicinity will help in exchanging culture. The envisaged direct impact is medium in magnitude, local in extent, long term in duration and hence significant in nature.

#### 7.5.2.5 CORPORATE SOCIAL RESPONSIBILITY (CSR) ACTIVITIES

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During the operation phase of the project, beside commercial activities, project will support various community programs on the basis of public interest. Project will organize different welfare programs for the wellbeing of the society to minimize the effect of the complex to the possible extent. Furthermore, the proponent will also take full responsibility for the any kind of adverse impact of its activities on the environment, communities, stakeholders and all other members of the society. In gist, it will help in enhancement in the skill of local and promotion in the small-scale business.

The envisaged direct impact is medium in magnitude, site specific in extent, long term in duration and therefore will be significant in nature.

**7.6 PRODUCTION PURPOSE IMPACT AND MITIGATION MEASURES**

<b>PRODUCTS</b>	<b>Impact</b>	<b>Mitigation measure</b>
<b>a) Water Pollution</b>	<ul style="list-style-type: none"> <li>Large volumes of wastewater are generated during dyeing and finishing processes, which often contain dyes, salts, and heavy metals. These pollutants can harm aquatic ecosystems if discharged untreated</li> </ul>	<ol style="list-style-type: none"> <li>Install an Effluent Treatment Plant (ETP) to treat wastewater before discharge.</li> <li>Implement Zero Liquid Discharge (ZLD) systems to recycle water and reduce waste.</li> <li>Use eco-friendly dyes and chemicals to reduce toxicity</li> </ol>
<b>b) High Water Consumption</b>	<ul style="list-style-type: none"> <li>The dyeing process is water-intensive, contributing to water scarcity in areas where water resources are limited.</li> </ul>	<ol style="list-style-type: none"> <li>Optimize water usage by using low-liquor-ratio dyeing machines.</li> <li>Implement closed-loop water recycling systems.</li> <li>Train employees on water-saving practices.</li> </ol>
<b>d) Energy Consumption</b>	<ul style="list-style-type: none"> <li>Significant energy is required for heating, drying, and other processes, contributing to greenhouse gas emissions.</li> </ul>	<ol style="list-style-type: none"> <li>Use energy-efficient machinery and invest in renewable energy sources like solar and wind.</li> <li>Recover and reuse heat from wastewater with heat recovery systems.</li> <li>Conduct regular energy audits to identify areas for efficiency improvements</li> </ol>
<b>e) Air Emissions</b>	<ul style="list-style-type: none"> <li>Processes in textile production release volatile organic compounds (VOCs) and greenhouse gases, affecting air quality and contributing to climate change.</li> </ul>	<ol style="list-style-type: none"> <li>Install air filtration and scrubbing systems to capture emissions.</li> <li>Switch to low-VOC chemicals and dyes.</li> <li>Implement renewable energy solutions to reduce fossil fuel use</li> </ol>
<b>d) Solid Waste Generation</b>	<ul style="list-style-type: none"> <li>Sludge from wastewater treatment and unused dye chemicals create solid waste,</li> </ul>	<ol style="list-style-type: none"> <li>Develop waste-to-energy initiatives or recycle sludge into construction materials.</li> <li>Implement source reduction and recycling practices.</li> </ol>

	<p>which can lead to land pollution if not managed properly.</p>	<p>c) Partner with waste management companies to ensure safe disposal</p>
<p><b>e) Chemical Use and Toxicity</b></p>	<ul style="list-style-type: none"> <li>• Various hazardous chemicals are used in dyeing and finishing, posing risks to both worker health and the environment</li> </ul>	<p>a) Substitute hazardous chemicals with safer alternatives and conduct regular safety training.</p> <p>b) Implement closed-system chemical handling to minimize exposure.</p> <p>c) Follow strict chemical management practices and obtain certifications like OEKO-TEX® for safe textile chemicals.</p> <p><b>Collaboration and Innovation:</b></p> <p>Industry Collaboration: Collaborate with other stakeholders, including suppliers, manufacturers to share best practices and drive industry-wide change.</p> <p>Invest in Innovation: Support research and development of new technologies and materials that have lower environmental impacts.</p> <p>Implementing these mitigation measures requires a commitment to sustainability at every level of the fashion industry, from design and production to retail and consumer behavior. It also involves ongoing innovation and a willingness to adapt to emerging best practices in sustainable fashion.</p>

**7.6.1 BENEFICIAL IMPACT IDENTIFICATION AND EVALUATION MATRIX**

The beneficial impacts during construction and operation phase are presented in following table as;

TABLE 7-1 BENEFICIAL IMPACT IDENTIFICATION AND EVALUATION MATRIX

S.N.	Issues	Impacts	Impact Rating				
			Nature	Magnitude	Extent	Duration	Rating
<b>Beneficial Impacts</b>							
<b>Construction Phase</b>							
1	Employment Opportunity	Employment generation and local employment	D	H	SS	ST	Significant
2	Skill Enhancement	Skill and knowledge development through training and orientation	D	M	Lo	LT	Significant
3	Increase in Economic Activities	Increase in economic activities due to supply of goods and services	D	M	SS	LT	Significant
<b>Operation Phase</b>							
1	Employment Generation and Promotion	Increases in economic status of employer Growth of local economy	D	H	Lo	LT	Significant
2	Income and revenue generation	Income and revenue generation for the both proponent and Shiddhirganj, Narayanganj, Narayanganj	D	M	Lo	LT	Significant

3	Promotion of local business	Establishment of small-scale business leading to growth of economic condition of local	D/ID	M	Lo	LT	Significant
4	Cultural Exchange	Cultural exchange between locals and tourists	D	M	Lo	LT	Significant
5	Corporate Social Responsibility activities	Enhancement in the skill of local and promotion in the small-scale business	D	M	SS	LT	Significant

**Notes:** D= Direct; ID= Indirect; H= High; M=Medium; SS= Small scale; Lo= Local; R= Regional; ST= Short Term; LT= Long Term

## 7.7 COMMUNITY RECOMMENDATIONS

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The following recommendations were made during public consultation -

- As positive externalities, the proposed project should improve and create a livelihood for the local people;
- Local people should be employed by the contractor during construction work;
- Adequate safety measures should be taken during construction work;
- Concerns were also raised on possible traffic and population pressure caused by external employed personnel;
- Finally, local people have appreciated the Project and employment generation; and have promised that they will cooperate with the executing agency during project implementation.

## 7.8 IDENTIFICATION OF ENVIRONMENTAL ATTRIBUTES

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Before environment impact assessment it is necessary to focus on environmental parameters, the major concern of selecting the environmental parameters is for Impact identification, prediction, and quantification. These parameters may be independent or inter-related with each other as well as related to the proposed project. The selected parameters for the Environmental Impact Assessment are illustrated below.

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### 7.8.1 ECOLOGICAL PARAMETERS

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Floral Communities, Faunal Communities, Aquatic Ecosystem, and Marine ecosystem.

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### 7.8.2 PHYSIO-CHEMICAL PARAMETERS

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Water quality, Air quality, Soil quality, and Land use.

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### 7.8.3 SOCIO-ECONOMIC ENVIRONMENT

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Aesthetic Conditions, Local Housing Structures, Public Services, Health & Safety, Socio-economic activities, Employment.

## 7.9 IDENTIFICATION OF POTENTIAL PHYSICAL ENVIRONMENTAL IMPACT

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### 7.9.1 CONSTRUCTION PHASE

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#### 7.9.1.1 IMPACT ON LAND USE

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The construction of the project will bring change in the existing land use of the area are permanent as well as temporary. The permanent land use conversion will be due to the construction of main

block, pool facilities and utilities and generator house. No hill cutting activities will be occurred during the construction of the project. The storage of construction materials may change the land temporarily but will be reversed to previous state. The envisaged direct impact is low in magnitude, site specific in extent and long term in duration and hence insignificant in nature.

#### 7.9.1.2 IMPACT DUE TO SPOIL DISPOSAL

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Construction works require huge quantity of materials from excavation work. The spoil generated during the construction period will temporarily burden the project environment. Stockpiling of those construction materials will create aesthetic pollution and can cause health hazards when mixed with water sources. The spoil and muck disposed during these activities will be managed within the project premises.

The envisaged direct impact is low in magnitude, site specific in extent, short term in duration and hence insignificant in nature.

#### 7.9.1.3 IMPACT ON AIR

---

During construction phase mixing of cement, sand, and aggregate, transport of materials etc. which may make the environment dusty and pollute the air in and around the construction site.

The envisaged direct impact is medium in magnitude, local in extent, short term in duration and hence significant in nature.

#### 7.9.1.4 IMPACT DUE TO NOISE GENERATION AND VIBRATION

---

The major impact on the noise level of the proposed project, during the construction phase, is envisaged due to the noise generated by the operation of the machineries, equipment, and some mechanical works. There are many equipment and machineries likely to be used during the construction. These are mainly recognized to be Dozers, Cranes, Trailers, Generators, etc. It is envisaged that the noise level due to this equipment will be 70-85 dB (A) at the receptor point at the associated work/construction area. The impacts due to noise of these equipment will be local and temporary

#### 7.9.1.5 ISSUES CONCERNED WITH CONSTRUCTION WASTE

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The mostly generated solid wastes during the construction phase includes debris, broken brick pieces, left out/non-usable reinforcement bars, sand, stone, waste cement and sand mix and packing materials which will adversely affect the area at and around if not handled and managed properly cause health hazards.

The envisaged direct impact is medium in magnitude, local in extent, short term in duration and hence significant in nature.

#### 7.9.1.6 IMPACT ON GROUND WATER

---

During the construction phase the water requirement will be fulfilled from ground water. The water requirement during the construction phase will be supplied by ground water extraction.

The envisaged direct impact is low in magnitude, site specific in extent and short term in duration and hence insignificant in nature.

#### 7.9.1.7 IMPACT DUE TO WASTE GENERATION

---

A number of people required for the construction will approach to the project site. Waste generated during construction phase when not treated carefully, it will degrade the environment from foul smell and rodents. This will have adverse impact to the surrounding.

The envisaged indirect impact is low in magnitude, local in extent, short term in duration and hence insignificant in nature.

#### 7.9.1.8 IMPACT DUE TO WATER POLLUTION

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The waste water, lubricating oils used in the machineries, construction equipment and vehicles, liquid waste coming out from cleaning, paint, solvent and other chemicals which may pollute the land, contaminate the soil and in the long run may pollute and contaminate the surface water and ground water, if not handled properly. If proper care is not taken, oil may be spilled from the construction equipment or chemicals used may come in contact with water during the construction activities. This can contaminate surface and ground water.

The envisaged direct impact is high in magnitude, site specific in extent, and short term in duration and hence significant in nature.

#### 7.9.1.9 ISSUES CONCERNED WITH FIRE HAZARD

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During use of electrical machines, electrical equipment's handling may cause the fire hazards.

The envisaged indirect impact is Medium in magnitude, site specific in extent and long term in duration and hence significant in nature.

#### 7.9.1.10 ENERGY ALTERNATIVES

---

The energy required during the construction phase of proposed project will be supplied from national electricity grid. During the power cutoff energy will be supplied through generators.

The envisaged direct impact is characterized as direct, low, site specific and short term and hence significant in nature.

#### 7.9.1.11 SOIL STABILITY AND SAFETY OF NEIGHBORING PROPERTIES

---

There will be slight excavation work for the construction of basement piling during the construction time of project which envisaged possible sliding or failure of ground attached to the neighboring houses and roads.

The envisaged direct impact is medium in magnitude, local in extent, short term in duration and hence significant in nature.

#### 7.9.1.12 EFFECT OF HEAVY EQUIPMENT ON ROAD SURFACE

---

There will be significant increment in the movements of heavy vehicles like excavator, tipper, tractor, concrete mixture for the transportation of raw materials to project area. This activity may increase pressure on road surface.

The envisaged direct impact is low in magnitude, site specific in extent, short term in duration and hence significant in nature.

#### 7.9.1.13 ROAD CONGESTION, TRAFFIC AND PARKING ISSUES

---

There will be significant increment in the movements of vehicles for the transportation of construction materials to project area. This activity may increase the traffic congestion in Shiddhirganj, Narayanganj, Narayanganj road.

The envisaged direct impact is medium in magnitude, local in extent, short term in duration and hence significant in nature.

### 7.9.2 OPERATION PHASE

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#### 7.9.2.1 SOLID WASTE GENERATION AND ITS MANAGEMENT ISSUES

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The operation of the project will produce only domestic solid waste. The waste will include food packages, empty water bottles, used tissues, paper waste, food remains etc. This solid waste will be collected in waste bins and will be transferred to Municipality.

When wastes are not treated separately and carefully, it will have significant impact. For the case of project, the estimated generation of solid waste will be minimal and as low in final stage after reuse and composting. Based on this scenario, the issues related with management is concerned with waste collection system.

The envisaged direct impact is high in magnitude, local in extent, long term in duration and hence very significant in nature.

#### 7.9.2.2 WASTE WATER MANAGEMENT ISSUES

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No wastewater will be generated from production process but at screen wash process wastewater will be generated which will be treated by ETP. The project will set up sock pit & septic tank which will be connected by ETP for treatment of sewage water.

The envisaged direct impact is high in magnitude, local in extent, long term in duration and hence very significant in nature.

#### 7.9.2.3 GROUND WATER AVAILABILITY AND RECHARGE ISSUES

---

The project will require more water during operation phase of water per day for various purposes. The project will use groundwater for its drinking & sanitation purpose. From this, if the withdrawal rate exceeds the recharge rate, there will be a chance of ground water depletion in the surrounding area.

Hence, increment in use of water will not create significant pressure on water sources and its availability.

The envisaged direct impact is low in magnitude, local in extent, long term in duration and hence significant in nature.

#### 7.9.2.4 FIRE, ACCIDENTAL HAZARD AND EMERGENCY PREPAREDNESS

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Project might get fire at any time by any cause like electric sorts, lightening, carelessness of project staffs, visitors, from kitchen, smoking cigarettes. If proper extinguisher systems are not installed in project, project will be in great risk.

The envisaged indirect impact is low in magnitude, site specific in extent and long term in duration and hence insignificant in nature.

#### 7.9.2.5 NOISE POLLUTION

---

Different noise sources will be present due to various activities of the resource operation like increased human inflow, parties and functions, operation of generators and pumps. The noise generated from mobility of guests and workers may be insignificant in comparison to vehicular movement, operation of diesel generators and pumps.

The envisaged direct impact is low in magnitude, site specific in extent, medium in duration and hence insignificant in nature.

#### 7.9.2.6 TRAFFIC CONGESTION AND OBSTRUCTION

---

The traffic density will be insignificantly high during the operation phase of the project due to increase in flow of project guests. Since the entrance of the proposed project leads to the Shiddhirganj, Narayanganj, Narayanganj- Highway, the inflow of vehicles is likely creating traffic obstruction and congestion which will affect the locality.

The envisaged direct impact is low in magnitude, site specific in extent, medium in duration and hence insignificant in nature.

#### 7.9.2.7 DRAINAGE MANAGEMENT

---

The project site is located in Shiddhirganj, Narayanganj, Narayanganj. This area still retains its natural topographic features of land and water infiltration rate with very low concrete structures.

The envisaged direct impact is medium in magnitude, site specific in extent, and long term in duration and hence significant in nature.

#### 7.9.2.8 HIGHER ENERGY REQUIREMENTS

---

The energy required during the operation phase of proposed project will be supplied from national electricity grid. Also, HVAC-Heating, ventilation and air conditioning related issues will demand more energy that will create pressure on electricity demand. During the load shedding energy will be supplied through generators. At that time operation of generator will create air and noise pollution at the project site.

The envisaged direct impact is high in magnitude, site specific in extent, short term in duration and hence significant in nature.

## **7.10 IDENTIFICATION OF POTENTIAL BIOLOGICAL ENVIRONMENTAL IMPACT**

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### **7.10.1 CONSTRUCTION PHASE**

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#### **7.10.1.1 IMPACT ON FLORA AND FAUNA**

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There is not any significant amount of endangered flora and fauna determined on the project site; therefore, construction would have no adverse effects on endangered flora and fauna. There would have been some impacts on fauna due to the construction of the project.

#### **7.10.1.2 IMPACT ON ECOSYSTEM**

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Impacts of construction on the ecosystem are negligible since there are;

- No removal or interference with the prey of predatory animals.
- No significant siltation from run-off, altering aquatic and marine flora and fauna populations and hence population dynamics of dependent organisms;
- No noises disrupting breeding behavior or use of breeding grounds, resulting in shifts in population dynamics; and
- No removal of predatory animals resulting in increased prey populations that exceed the carrying capacity of the local environment.

### **7.10.2 OPERATION PHASE**

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#### **7.10.2.1 IMPACT ON FLORA AND FAUNA**

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It is assumed that the air emissions majority may affect the land biota, whereas the fauna species can be moved away from the discomforting sources, and plants will have to respond physiologically. Operation of the project will supply reliable electrical energy to the users in the region which will limit the use of any systems that could have adverse impact on the environment.

#### **7.10.2.2 IMPACT ON ECOSYSTEM**

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There will be no significant impact on operation of the project on the ecosystem as no hazardous effluent will be discharged to receiving bodies. The noise generated from the project may cause disturbance to several animals which is insignificant.

## **7.11 IMPACT ON SOCIO-ECONOMIC AND CULTURAL ENVIRONMENT**

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### **7.11.1 CONSTRUCTION PHASE**

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#### **7.11.1.1 DEMOGRAPHIC**

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The construction of the project will have limited effects on the demographic conditions. There are no permanent living quarters associated with the proposed project. The project wouldn't cause any displacement of individuals whose livelihood depends on the land that will be occupied by the project.

#### 7.11.1.2 CONFLICT IN OR WITH NEARBY HOST COMMUNITIES

---

Influx of the construction workers from other parts of the area may increase conflict. In general, conflict among the workers due to the difference in opinions and interests may arise during the construction phase in the project area.

The envisaged indirect impact is low in magnitude, site specific in extent, short term in duration and hence insignificant in nature.

#### 7.11.1.3 GENDER RELATED ISSUES

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During the construction work of project, use of female labor might be lower as beliefs of that male can do more work in same time interval in construction activities of project. For this case, there can be chance of wage discrimination and opportunity.

The envisaged indirect impact is low in magnitude, site specific in extent, short term in duration and hence insignificant in nature.

#### 7.11.1.4 HEALTH AND SANITATION IN AND AROUND PROJECT SITE

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The biodegradable and non- degradable wastes generated from the labor camps will pollute the surrounding environment, if not managed properly. The haphazard disposal or storage of biodegradable wastes will increase foul odor, can provide favorable habitat for disease vectors like rodents, mosquitoes, flies and can impact community health.

The envisaged direct impact is moderate, site specific and short term and hence insignificant in nature.

#### 7.11.1.5 OCCUPATIONAL HEALTH AND SAFETY

---

Working without use of safety measures during excavation work, spoil management work, electrical equipment handling activities, constructional activities may call the risk of accidents. From many accidents, primary victims may be the workers involved in the construction.

The envisaged direct impact is medium in magnitude, local in extent, short term in duration and hence significant in nature.

#### 7.11.1.6 GRIEVANCES MANAGEMENT

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Influx of the construction workers from other parts of the project area may increase conflict. In general, conflict among the workers due to the difference in opinions and interests may arise during the construction phase in the project area. If the construction phase grievances are not recorded properly then it may arise conflict with hereby local residents.

The envisaged indirect impact is low in magnitude, site specific in extent, short term in duration and hence insignificant in nature.

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## 7.11.2 OPERATION PHASE

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### 7.11.2.1 DEMOGRAPHIC

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The operation of the project will have limited effects on the demographic conditions since there is no permanent living quarters associated with this proposed project. Hence there will be no increased demand on local infrastructures, such as utilities, housing medical facilities, schools, water, and food. The project will not cause any displacement of individuals whose livelihood depends on the land that will be occupied by the proposed project. The labor force for the operation of the plant will be supplied also from local area, which will result in increased disposable income for project employees. The proposed project will contribute in the GDP of the country which is a positive impact of the project.

### 7.11.2.2 OCCUPATIONAL HEALTH AND SAFETY

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Working without use of safety measures may call the risk of accidents. The workers from different departments have different risk factors and with various health impacts ranging from burning, skinning and cutting. The employees working in the food and beverage department and kitchen utilize machines with electrically driven and extremely sharp knives to chop hard fruits and vegetables. Workers deal with wastes could have caught with communicable diseases. Employees working in high noise areas like pump and generator operators will be impacted by high level of noise and electrocutions. The other health risks are burning due to accidental firing inside kitchens, possible accidents due to slipping in wet floors etc.

The envisaged impact is direct in nature, site specific in extent, moderate in magnitude and long term and hence significant in nature.

### 7.11.2.3 GRIEVANCES MANAGEMENT

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The mis-management of during operation phase like increased noise level in surrounding from party, water scarcity during dry season, unmanaged waste generated from the project, disturbance to nearby roads due to haphazard parking practice from guests and employees will raise grievances in nearby community.

The envisaged impact is characterized as direct in nature, site specific in extent, moderate in magnitude and long term in duration.

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## 7.12 CHEMICAL ENVIRONMENT

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### 7.12.1 CONSTRUCTION PHASE

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#### 7.12.1.1 IMPACT DUE TO CHEMICALS FOR CURING AND PROTECTION OF MATERIALS

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The chemicals used during the construction period like concrete curing, protective and decorative coatings, floor hardener and dust proofer, water proofing chemicals will cause water, soil and air pollution leads to cause health problem and environmental hazard.

The envisaged direct impact is high in magnitude, local in extent, long term in duration and therefore very significant in nature.

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#### 7.12.2 OPERATION PHASE

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##### 7.12.2.1 IMPACT DUE TO USE OF CHEMICAL LIKE PESTICIDES AND DETERGENTS

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Chemicals like pesticides are widely used for maintenance and protection of the ornamentals plant. From this, pesticides runoff to the surrounding area and water sources will cause water and soil pollution. Also, soap, detergent and chemical used for dishwashing from bathroom, toilet are not managed with care will pollute the surrounding.

The envisaged indirect impact is low in magnitude, local in extent, long term in duration and hence significant in nature.

7.12.3 ADVERSE IMPACT IDENTIFICATION AND EVALUATION MATRIX

TABLE 7-2 ADVERSE IMPACT IDENTIFICATION AND EVALUATION MATRIX

S.N.	Issues	Impacts	Impact Rating				
			Nature	Magnitude	Extent	Duration	Rating
<b>A</b>	<b>Adverse Impacts</b>						
<b>Physical Environment</b>							
<b>A6.8.1</b>	<b>Construction Phase</b>						
A6.8.1.1	Change in land use	Change in land use due to construction of project	D	L	SS	LT	Insignificant
A6.8.1.2	Impact due to spoil disposal	Water, soil and air pollution	D	L	SS	ST	Insignificant
A6.8.1.3	Impact due to air	Air pollution	D	M	Lo	ST	Significant
A6.8.1.4	Impact due to noise and vibration	Noise pollution	D	M	Lo	ST	Significant
A6.8.1.5	Issues concerned with Construction waste	Water, soil and air pollution	D	M	Lo	ST	Significant
A6.8.1.6	Impact on ground water	Reduce the water table	D	L	SS	ST	Insignificant
A6.8.1.7	Impact due to waste generation	Reduction on drainage and waste disposal quality	ID	L	Lo	ST	Insignificant
A6.8.1.8	Impact due to water pollution	Water Pollution	D	L	Lo	ST	Insignificant
A6.8.1.9	Issues concerned with fire hazard	Accident, loss of lives and property	ID	M	SS	LT	Significant

A6.8.1.10	Energy alternatives	Sound pollution	D	L	SS	ST	Insignificant
A6.8.1.11	Soil stability and safety of neighboring properties	Sliding or failure of ground	D	M	Lo	ST	Insignificant
A6.8.1.12	Effect of heavy equipment on road surface	Damage on road surface	D	L	SS	ST	Insignificant
A6.8.1.13	Road congestion, traffic and parking issues	Congestion around the road, traffic and parking area	D	M	Lo	ST	Significant
<b>A6.8.2</b>	<b>Operation Phase</b>						
A6.8.2.1	Solid Waste management issues	Soil, water and air pollution	D	H	Lo	LT	Significant
A6.8.2.2	Waste water management issues	Water quality and pollution	D	H	Lo	MT	Significant
A6.8.2.3	Ground water availability and recharge issues	Reduction in ground water table	D	H	SS	LT	Significant
A6.8.2.4	Fire, accidental hazard and emergency preparedness	Accident and loss of life and properties	ID	L	SS	LT	Insignificant
A6.8.2.5	Noise pollution	Noise pollution	D	L	SS	MT	Insignificant

A6.8.2.6	Traffic congestion and obstruction	Congestion around the road side traffic jam, parking area	D	L	SS	MT	Insignificant
A6.8.2.7	Drainage Management	Inundation of water from urban storm water	D	M	SS	LT	Significant
A6.8.2.1	Higher energy requirements	High energy demand due to operation of many electronic appliances	D	H	SS	LT	Significant
<b>Biological Environment</b>							
<b>A6.9.1</b>	<b>Construction Phase</b>						
A6.9.1.1	Impact on flora and fauna	Loss of biodiversity	D	M	SS	MT	Significant
A6.9.1.2	Impact on ecosystem	Ecosystem disruption	D	M	SS	MT	Significant
<b>A6.9.2</b>	<b>Operation Phase</b>						
A6.9.2.1	Impact on flora and fauna	No impact is identified	-	-	-	-	-
A6.9.2.2	Impact on ecosystem	Ecosystem disruption	ID	L	SS	LT	Significant
<b>Socio-economic and Cultural Environment</b>							
<b>A6.10.1</b>	<b>Construction Phase</b>						
A6.10.1.1	Demographic	No impact is identified	-	-	-	-	-

A6.10.1.2	Project associated conflict	Conflict in or with nearby host communities (between local and outsiders)	ID	L	SS	ST	Insignificant
A6.10.1.3	Gender related issues	Discrimination in opportunity and wage	ID	L	SS	ST	Insignificant
A6.10.1.4	Health and sanitation around project sites	Incident of diseases	D	M	SS	ST	Insignificant
A6.10.1.5	Pressure on utilities and infrastructures	Pressure on public infrastructures and facilities	D	M	SS	ST	Insignificant
A6.10.1.6	Occupational health and Safety	Accident to the labors and loss of life	D	M	Lo	ST	Significant
A6.10.1.7	Grievances management	Conflict and dispute among the workers	ID	L	SS	ST	Insignificant
<b>A6.10.2</b>	<b>Operation Phase</b>						
A6.10.2.1	Demographic	No impact is identified	-	-	-	-	-
A6.10.2.2	Occupational health and Safety	Probability of accident and loss of life	D	M	Lo	ST	Significant
A6.10.2.3	Safety and security of	Crime and disharmony in the	IN	M	SS	LT	Significant

	visitors	society					
A6.10.2.4	Grievances management	Dispute and conflict among the staff and nearby society	ID	L	SS	ST	Insignificant
<b>Chemical Environment</b>							
<b>A6.11.1</b>	<b>Construction Phase</b>						
A6.11.1.1	Impact due to chemicals for curing and protection of materials	health problem and environmental hazard	D	H	SS	LT	Significant
<b>A6.11.2</b>	<b>Operation Phase</b>						
A6.11.2.1	Impact due to chemicals like pesticides and detergents	Pollute surrounding area and water sources	D	L	SS	LT	Insignificant

**Notes:** D= Direct; ID= Indirect; H= High; M=Medium; SS= Small scale; Lo= Local; R= Regional; ST= Short Term; LT= Long Term

### **7.13 IMPACT ANALYSIS BY LEOPOLD MATRIX METHOD**

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The impacts of the man-made, unlike its type, can be assessed by matrix analysis, which is very well known as the Leopold Matrix System among the environmentalists of the world.

The impacts of the plant construction, it was assessed by a method adapted from the Leopold method, and the outcomes of the analysis are tabulated on subsequent pages.

The criteria for evaluation of the qualitative matrix are presented here:

**1) No Impact (0)**

This indicates that the project activity is unlikely to have any impact on an environmental attribute.

**2) Negligible Adverse Impact (-1) / Negligible Beneficial Impact (+1)**

It signifies that the actions have a minor effect, adverse or beneficial, on the environmental parameters concerned.

**3) Significant Adverse Impact (-2) / Significant Beneficial Impact (+2)**

The activities and their environmental Impacts are judged to be significant if they create, or have the potential to create concern in the public or professional community.

**4) High Adverse Impact (-3) / High Beneficial Impact (+3)**

The action can create, or have the potential to create controversy in the public or professional community, due to its long-term effect. They may be at times irreversible.

The matrices for both the construction and operation phases are presented below considering the environmental attributes discussed in the previous section.

TABLE 7-3 IMPACT MATRIX FOR CONSTRUCTION PHASE

Sl. No.	Project Activities	Water Requirements	Civil Works	Mechanical Works	Operation of Machineries and Equipment	Transportation activities	Total
<b>PARAMETERS</b>							
<b>Physical Parameters</b>							
1	Water Quality	0	-1	0	0	0	-1
2	Air Quality	0	-1	0	0	-1	-2
3	Soil Quality	0	-2	0	0	0	-2
4	Noise	0	-1	0	0	0	-1
<b>Social Parameters</b>							
5	Aesthetic	0	0	0	0	0	0
6	Local Housing Structure	0	0	0	0	0	0
7	Activities of Local People	0	2	2	1	0	5
8	Health and Safety	0	-1	0	0	0	-1
<b>Ecological Parameters</b>							
9	Flora and Fauna	0	-1	0	0	0	-1
10	Agriculture	0	-2	0	0	0	-2
11	Ecosystem	0	-1	0	0	0	-1
<b>Economic Parameters</b>							
12	Employment	0	3	3	3	3	12
<b>Total</b>		0	-5	5	4	2	6

TABLE 7-4 IMPACT MATRIX FOR OPERATION PHASE

Sl. No.	Project Activities	Operational activities	Water Requirement	Domestic activities and waste disposal	Electricity Consumption	Transportation activities	Total
<b>PARAMETERS</b>							
<b>Physical Parameters</b>							
1	Water Quality	-1	-1	-1	0	0	<b>-3</b>
2	Air Quality	0	0	0	0	0	<b>0</b>
3	Soil Quality	0	0	0	0	0	<b>0</b>
4	Noise	0	0	0	-1	0	<b>-1</b>
<b>Social Parameters</b>							
5	Aesthetic	3	0	0	0	0	<b>3</b>
6	Activities of the local people	1	0	0	0	0	<b>1</b>
7	Health and Safety	0	1	0	0	0	<b>1</b>
<b>Ecological Parameters</b>							
8	Flora and Fauna	0	0	0	0	0	<b>0</b>
9	Marine Ecology	0	0	0	0	0	<b>0</b>
	Agriculture	3	0	0	0	0	<b>3</b>
10	Environmental Sustainability	3	0	0	0	0	<b>3</b>
<b>Economic Parameters</b>							
11	Employment	3	0	2	0	3	<b>8</b>
12	GDP Growth	2	0	0	0	0	<b>2</b>
	<b>Total</b>	<b>14</b>	<b>0</b>	<b>1</b>	<b>-1</b>	<b>3</b>	<b>17</b>

TABLE 7-5 POTENTIAL IMPACTS DUE TO PROJECT CONSTRUCTION AND OPERATION

No	Impacts	Negative		Positive		No Impact	Magnitude Low - L Medium - M High - H	Mitigation Measures
		Short Term	Long Term	Short Term	Long Term			
<b>A</b>	<b>General</b>							
	Displacement of People					√	-	-
	Change of Land use			√			L	N/A
	Loss of trees/vegetation	√					L	Plantation Around the land
	Shifting of utilities					√	-	-
	Impact on archaeological property					√	-	-
<b>B</b>	<b>Construction Phase</b>							
	Pressure on local infrastructure	√					L	N/A
	Impact on water quality	√					L	Proper drainage, use substances that protect against leaching of oil
	Impact on air quality (including dust generation)	√					M	Tarpaulin or jute sheet use during construction
	Noise pollution	√					M	Use Earplug for personnel, use modern machinery, Cover the area
	Traffic congestion	√					L	Traffic management and permit heavy vehicle in the early morning or night
	Disposal of construction debris/material	√					L	Do not dispose anywhere, sell or store
	Public health and safety	√					M	Strictly follow to use PPE
	Social Impact			√			L	-
<b>C</b>	<b>Operational Phase</b>							
	Change in ambient air quality	√					L	Water spray around the project sites
	Impact on water quality		√				L	Proper drainage
	Increase in noise level					√	L	Cover the area and machinery

	Water harvesting and recharge				√		L	-
	Disposal of solid waste		√				L	Proper waste management as per BD guidelines and other solid waste will be sold to the third party.
	Quality of life				√		M	-
	Contribution to National GDP				√		L	-
	Increment in green cover	√					L	-

**7.14 CONCLUSION**

It has been noticed from both matrix that the proposed project is basically construction of project namely **Midland Knitwear Limited** Hence there is no activity found accountable to create any major adverse impact on environmental quality. The impact matrix revealed that, noise will be the major environmental issue regarding the construction of the factory. Adverse impacts on soil erosion and workers health & safety due to Factory construction and operation were found among all the adverse impacts. However, those impacts can be reduced to a negligible amount by proper Management measures. Civil works during construction phase may alter the soil structure of the surrounding area. In furtherance to these, the study and evaluation of impacts, has shown that the proposed project would have major encouraging impacts due to social economic and environmental developments in terms of getting sustainable alternative to natural gas, growth in GDP and creating employment opportunity.

It can be concluded that the overall negative impact from various activities on different environmental parameters is negligible with proper Environmental Management Plan (EMP) in place. Even the negative impacts can be converted into positive beneficial impact with proper and timely implementation of EMP. **Hence, project can be considered environmentally safe & fit.**

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## CHAPTER 8 ENVIRONMENTAL MANAGEMENT PLAN

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### 8.1 ENVIRONMENTAL MANAGEMENT SYSTEMS (EMS)

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An environmental management system is the process used by an organization to manage, review, correct, and improve the organization's approach to business. An Environment Management System (EMS) is a tool for managing the impacts of project activities on the environment. An EMS offers a structured way to incorporate environmental considerations into day-to-day operations; it promotes continual improvement of the environment. The concept of EMS is very much similar to financial management system. As management system monitors, regulate and audit the income and expenditure thus ensuring a regular check on the project performance and take positive steps if any diversion from the objective and criteria is found with an aim of ensuring better management of financial resources to provide aid in the growth and development of the company, similarly an EMS monitors and check the environmental performance, integrate and implement the environmental management and its performance with and along the routine operations of a company, long and short term planning, quality management system and take positive steps in case of any diversion with a view to ensure better and enhanced performance.

### 8.2 COMPONENTS OF AN ENVIRONMENTAL MANAGEMENT SYSTEM

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In order to develop an EMS an organization has to identify the impacts, set targets to reduce the negative impacts, plan and decide the targets and set proper and appropriate steps to achieve the targets effectively and efficiently.

The most important component of an EMS is commitment towards an organization which is a two-fold process and has in a symbiotic manner by both the staffs and the organization. Apart from the other vital component which form part of EMS considered are:

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#### 8.2.1 ENVIRONMENTAL IMPACT IDENTIFICATION:

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Any economic development project, whether it is a simple and small or a large and complex it has some environmental implications. The environmental implications may be beneficial or adverse, but the main objective of impact identification is to specify areas that are likely to be affected by the implementation of a project. Environmental impact, by definition, implies an alternation of environmental conditions or creation of a new set of adverse or beneficial environmental consequences caused by the action under consideration. It refers to identification and documentation of the actual and potential environmental impacts of an organization's operations need to be undertaken. This can be achieved through undertaking an environmental audit. Impact identification starts at the early stage of scoping when data on both the project and surrounding environment are made available. The preliminary identification of impacts from scoping may be confirmed or new impacts may be identified as requiring investigation.

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#### 8.2.2 OBJECTIVES AND TARGETS

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Decision of objectives and targets are of prime consideration which is possible only after environment audit. A sound and marked environmental audit can only enable in the determination of positive and feasible objectives and targets. While fixing objectives and targets it should be kept in mind that they should be feasible, specific and effective. It is always advisable for an organization to formulate stringent long-term objectives so as to encourage and enhance stable and continuous growth and performance.

However, it is also advised that the targets and objectives should be continuously and timely revised so as to ensure better results. Such objectives and targets are dependent on the impacts identified and observed at the time of procession of the activity of the proposed project and are set as per the impacts observed and recorded.

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### 8.2.3 CONSULTATIONS

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This component mainly aims at ensuring committed staffs to the organization. A proper and sound consultation with community and staffs should be done before implementation of EMP. This is very essential in order to assure that the staffs are completely devoted, committed and focused to EMP. In order to develop the commitment of staffs an organization can also take steps like providing a copy of the environmental policy as part of orientation to the employees, conducting of awareness training, each employee is expected to identify to their supervisors training that they feel would help to improve their performance, etc. which shall not only encourage commitment of staffs but also increase their competence level. It can also help to improve public perception of the company, one of the benefits of implementing an EMS.

Consultation with staff, local communities, associated experts/contractors, relevant organization and managerial bodies should be conducted at regular intervals or as and when required with a view of reviewing EMS work, discuss the problems concerned, share opinions and provide suggestive measures for the possibility of further improvement of EMS and EMP.

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### 8.2.4 OPERATIONAL AND EMERGENCY PROCEDURES

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Operational and emergency procedures mainly aim at ensuring that they are congruent with organization's environment objectives and targets and suggest required steps in case of any diversion. However, any changes if any should be included in the document and clearly specified.

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### 8.2.5 ENVIRONMENTAL MANAGEMENT PLAN

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An Environmental Management Plan (EMP) describes the processes that an organization shall follow to maximize its compliance and minimize harm to the environment.

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### 8.2.6 DOCUMENTATION

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This is one of the most crucial and important components which focuses on having a documented proof for all objectives, targets, policies, responsibilities and procedures along with information on environmental performance and its impacts. This is mostly useful in verifying environmental

performance to staffs, regulatory and community and can also be used at a later stage if or any further study as and when required.

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### 8.2.7 TRAINING

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This component mainly focuses on developing trained and competent staffs. This mainly deals with familiarizing the staffs with all their responsibilities, duties and tasks associated with them for implementation of EMS. For this purpose, different organizations follow various measures in order to infuse them with necessary skill and motivation required for effective and efficient implementation of EMP.

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### 8.2.8 REVIEW AUDITS AND MONITORING COMPLIANCE

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This component mainly targets towards smooth and subtle functioning of an activity. Prior and essential reviewing of audit and monitoring compliance should be done so as to achieve the stated objectives and to modify and steer the policies laid down with time in order to meet its goals. Monitoring is also one of the vital components which ensures whether all the requirements are met or not and everything is carried on in a systematic and planned way.

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### 8.2.9 CONTINUAL IMPROVEMENT

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This is the most important component as everything is based on the concept of continuous development. An EMS as said to be most efficient only when it is responsible for providing continual growth and improvement to the organization by reviewing and monitoring the targets and objectives set by the company. The policy and procedures laid down in this direction should be constantly monitored and checked and any changes if required should be ensured if the objectives are to be met in the most efficient way.

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### 8.2.10 ENVIRONMENT MANAGEMENT PLAN

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An Environmental Management Plan (EMP) can be defined as “*an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented; and that the positive benefits of the projects are enhanced*”. EMPs are therefore important tools for ensuring that the management actions arising from Environmental Impact Assessment (EIA) processes are clearly defined and implemented through all phases of the project life-cycle. This plan also helps an organization map its progress toward achieving continual improvements.

Each organization is unique and, as a result, so is Environmental Management Plans. The level of detail and length of an EMP shall vary depending on the type of organization, the complexity of its processes and the maturity of the organization in understanding its environmental responsibilities. Some plans may end up being only a few pages long, while others could become extensive documents. An EMP consists of:

- Environment Protection Plan to reduce impacts and risks. Issues related to existing legislation, codes of good engineering practice, proponent commitment

- Summary of Impacts and Risks. These are the actual expected impacts and risks of the projects, which shall need to be managed, monitored, and reported.
- Impact Management and Environmental Enhancement to balance adverse impacts by providing alternate benefits to adversely impacted persons or biophysical systems.
- Environmental monitoring plans.
- Impact Reporting.

The emphasis is on identifying issues and options, to guide the detailed design of specific EMP measures as part of program and project feasibility studies. Environmental Management Planning gives the tools to assess and manage environmental issues during every phase of your project or operations. The outcome shall minimize the risk of costly, time-consuming environmental issues, while maximizing productivity and performance. It provides a framework through which environmental priorities, responsibilities and risks are systematically managed. EMPs, which are often a key component of a project's regulatory filings, provide the basis for assurance that environmental factors shall be carefully managed throughout the project lifecycle.

An EMP also includes the Management measures and other environmental management activities for any project. This is an important aspect to preserve & improve the environmental quality of project area.

### **8.3 MANAGEMENT OF DIFFERENT ENVIRONMENTAL ASPECTS BASED ON IDENTIFIED IMPACTS**

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#### **8.3.1 MANAGEMENT MEASURES FOR AIR ENVIRONMENT DURING**

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##### ***Construction phase***

- Diesel driven construction machinery and equipment shall be fitted with appropriate silencers, will not be left idle for prolonged periods of time, and be subjected to regular scheduled maintenance to minimize the exhaust emission.
- Vehicle engines shall not be left running when not in use.
- Improperly functioning equipment and vehicles shall be removed from the project site or shall be repaired before returning to service.
- The contractor working for the project shall ensure that waste arising from the construction activity on site, shall not be burnt in the premises.
- Water sprinklers will be used to control the fugitive dust.

##### ***Operation phase***

- Burning of solid wastes or waste oils shall be strictly prohibited. The entire solid waste generated shall be disposed of.
- All the roads should be paved to reduce the pollution level.

- Emission from the equipment/machineries & transportation vehicles shall be monitored on regular basis.
- All necessary equipment/machineries shall be in good condition for proper operation.
- Employees shall be provided with sufficient environmental management & safety materials. They shall be given proper training as well as display of the summarized Environmental management & Safety Procedures shall be made available at site through signboard.
- Regular Air monitoring and inspection of the environmental management practices shall be carried out and the necessary documents & records shall be maintained.
- The Project authority should check the quality of the emitted gasses from generator after regular interval, to monitor the performance of generator. If in any case the result found that the emitted air doesn't comply with the any standard mitigation measures has to be taken according to the situation.
- The sources of air pollutants are burning fuel. During operation, these sources would emit the exhaust gases containing CO<sub>2</sub>, NO<sub>x</sub>, SO<sub>2</sub>, and negligible quantity of particulate matter (PM<sub>10</sub>). Control of air pollutants from these sources would be achieved by safe dispersal, providing adequate heights to the respective exhaust ducts, improving the combustion process and installing air pollution controller system if necessary.

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### 8.3.2 MANAGEMENT MEASURES FOR WATER ENVIRONMENT

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#### **Construction phase**

- During concrete work, care should be taken that no mortar or cementing material should fall in the water as this will not only pose impacts but also would lead to loss of material.
- As a precautionary measure these circumstances lead to providing of plastics sheet or tarpaulin in order to avoid any chance of dumping of construction materials into the water.
- Storage area of the construction material shall be at adequate distance from the coastal area to prevent any chances of contamination of coastal/marine environment as well as to facilitate efficient construction work.
- Runoff (Wastewater) from the construction work shall be carefully managed to ensure the prevention of entry of contaminants arising from construction work/site.

#### **Operation Phase**

##### **Waste Water Generation**

The production process will not produce any waste water. Some sewage waste will be produced some screen wash waste water will be treated by ETP which will be connected by sock pit and septic tank. And Sewage waste will be treated by 2 cubic meter per hour.

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### 8.3.3 MANAGEMENT MEASURES FOR LAND ENVIRONMENT

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#### **Construction phase**

- The small amount of construction debris and excavated material shall be disposed of in suitable pre-identified areas.
- Storage & handling of construction materials shall be done properly to avoid spillage or leakage which may cause release of the material in environment causing adverse impacts.
- Major contamination shall never occur beyond the periphery of construction site to prevent any effects on the marine & coastal ecology, human, terrestrial biota and avian community.

### **Operation phase**

- Operational area of concern for soil contamination.
- The used oil & discarded drums/empty containers shall be sold to the approved recycler/scrap dealers.
- Dumping of solid wastes or waste oils on land shall be strictly prohibited. The entire solid waste generated shall be disposed of.
- A designated solid waste storage area shall be provided.

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#### **8.3.4 MANAGEMENT MEASURES FOR NOISE**

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No significant noise will be generated in this project. The project will provide a noise free calm environment. In this project, the noise is created from a stand-by generator will not hinder the peaceful ambiance.

Noise level must have to be less than 85 dBA because working under a condition more than 85 dBA is harmful for health in short and long term. Mainly personnel working at the generator, Boiler is at high risk because the noise level found higher than the acceptable limit of both Department of Environment Bangladesh (DoE) and World Health Organization.

### **Construction phase**

- All vehicles shall be equipped with the horn of low noise level which is recommended by authority to avoid impacts on noise level. Further, adequate silencers must be attached with all vehicles to reduce the noise.
- Machineries/equipment causing high noise level shall not be operated during the night time.
- It would be ensured that the equipment used during construction is properly maintained to keep noise emissions within the permissible limits.
- Construction machinery should be in good working condition and engines turned off when not in use.

### **Operation Phase**

- The generator will be with canopy and silencer to reduce noise.

- The generator room will be covered by sound proof wall to reduce sound level in surrounding.
- Periodic monitoring of sound level at suggested places will be carried out.

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### 8.3.5 MANAGEMENT MEASURES FOR TERRESTRIAL BIODIVERSITY

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#### **Construction phase**

On regular basis monitoring shall be done to avoid contamination of natural habitats. The major impacts would be on terrestrial ecology. Care should be taken during the construction activity so that it will not affect the terrestrial habitants.

#### **Operation phase**

- Disposal of effluent & sewage shall not be made into the nearby/adjacent waterbody as well as other ecological habitats to prevent impacts on the ecological structure & habitat of the area.
- Any kind of solid waste shall not be dumped into the marine environment as well as on the land of premises /surrounding area.
- Contamination of marine water caused by any means of project operation shall be avoided to prevent adverse impacts on ecology.
- Regular monitoring of the local area shall be done to inspect any residual impacts on ecology caused by the project operation. Necessary technologies/facilities for prevention of such impacts shall be provided immediately by the project proponent.

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## 8.4 MANAGEMENT MEASURES FOR SOCIO-ECONOMIC ENVIRONMENT

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#### **Construction Phase**

Significant opportunity of direct & indirect employment and uplifting of the economic status of the people living in nearby area will be the major affirmative impact of the proposed project. Local population would also get opportunities in related services activities like small contractors, sub-contractors, supply of construction materials, supply of basic facilities like eatables to the site etc. The construction activities will generate lot of employment in the ancillary activities.

#### **Operation Phase**

The proposed project shall result in significant employment during the operation. The proponent shall give priority to the appointment of local people to the maximum extent during the employment process for the proposed project. Safety training shall be provided to all the workers. The workers shall pass through the medical examination prior to recruitment and periodic medical

checkup shall also be carried out. An emergency response plan and disaster management plan shall also be placed to take care of adverse impact in case of any incident of accident. Such plans shall also be helpful to the local area during the incidence of Natural Disaster.

## **8.5 OCCUPATIONAL HEALTH AND SAFETY**

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The construction and operational procedures shall in general ensure minimal disturbance to the ambient ecosystem during the construction/operation phase. Some of the aspects, by the virtue of the code as well as good engineering practice to be adopted by the client in their construction contracts, which shall ensure minimization of the impact during the construction phase through third-party inspection.

The proponent shall require all its contractors and their subcontractors to maintain their work areas properly. The construction contract shall include the provision of penalties and disciplinary action for contractors or subcontractors who do not maintain proper sanitation and environmental conditions in their working areas. The contractors shall also be briefed on the conditions imposed by regulating agencies on the project, the potential problems and Management measures and their obligations in the meeting those requirements. Proponent shall ensure that the contractors implement their instructions properly while constructing by incorporating appropriate conditions in the contract documents. Some of the safety aspects to be implemented are as under:

- Monitoring safe working procedures through safety work permit system and provided safety supervision.
- Safety audit of mechanical equipment and electrical installations.
- Distribution and keeping of personnel protective equipment and first-aid items to all working groups and at offices.
- Preparation and updating of safety standards and safe working procedures.
- Accident investigation, emergency handling and documentation of accident reports.
- Planning, organizing and conducting training programs for employees on safety, safe working procedures for various related activities.
- Planning, organizing and conducting safety awareness program for contractors and community.
- Welding, Painting will be carried out after providing temporary enclosures against wind, etc., if necessary.

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### **8.5.1 WORK-RELATED INJURIES**

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All occupational accidents should be notified to the family of the accident victim which should be informed as soon as possible and as required by national laws or regulations to the authority, the labor inspectorate the appropriate insurance or any other.

- (a) Immediately after reporting of an occupational accident-causing loss of life.

(b) Within a prescribed time for other occupational accidents. with a view to meeting the requirements of labour inspectorates, insurance institutions and the statistics producing body the forms prescribed in either a specific or single format should include at least the following minimum information on

(a) Facility and employer

(b) Injured person (name, address, sex, and employment status, occupation,

(c) Type nature and location of injury, (d) accident and its sequence (geographical location of the place of the accident, date and time, action leading to injury-type of accident).

National laws or regulation should provide for the specification of the relevant necessary information to be notified for commuting accidents and of more detailed information if available.

## **8.6 IMPLEMENTATION OF THE MANAGEMENT MEASURES**

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The responsibilities for the implementation of the Management measures are delegated to the project-promoting institution. They must mobilize appropriate expertise to design diverse types of Management measures, not all of which may be available within the institution. They can collaborate with other institutions in the public and private sectors. Effective results in this regard can be obtained if the collaborators cooperate in the implementation of the Management measure.

## **8.7 SOLID WASTE MANAGEMENT**

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Environmental Management with respect to solid waste management may be summarized as under:

- ✓ Separated bin should be provided
- ✓ Store waste and don't throw here to there.
- ✓ Burning wastes should be strictly prohibited.
- ✓ Wastes should be handled and disposed by Shiddhirganj, Narayanganj, Narayanganj Municipality.

## **8.8 AFFORESTATION**

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Trees and plants are well known for trapping noise, particulate matters, and gaseous pollutants, in controlling soil erosion and ground water charging. Green Belt has to be developed outside of plant premises adjacent to northern, western and southern boundary of the plant. The selection of plant species shall be made in consultation with local forest officials. Grassy lawns and gardens shall be developed in vacant areas within the plant premises under beautification scheme to increase the aesthetic value.

## **8.9 SAFETY & FIRE FIGHTING**

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**Safety**

The main safety features associated with the proposed development will be as follows:

- a) The layout and firefighting systems will be upgraded as per NFPA and Bangladesh Fire code.
- b) Inner boundary of 1.0 m height, brick masonry wall with 0.6 m height barbed wire fencing have been provided in all directions.
- c) Approach roads of adequate width shall be provided and to avoid congestion and to have safe exit in emergencies.
- d) All electrical fittings should be provided in licensed areas are flame proof and intrinsically safe.
- e) No smoking should be allowed inside the diesel storage tank.
- f) Fixed Water Spray system will have been installed for Bitumen handling area.
- g) Suitable storm water drain will have been provided.
- h) Adequate ventilation should be provided to reduce temperature near the heater.

### **Fire Fighting Facilities**

The firefighting system in the proposed facilities consists of Fire extinguisher, Fire Hydrant System and Emergency fire exit. Fire Hydrant rings covering all facilities will be upgraded as per NFPA.

### **Security**

The following security arrangement should be provided within the project-

- a) The facilities should be guarded round the clock by efficient security personnel. They prevent any unauthorized entry inside the plant.
- b) Watch towers should have been provided and manned round the clock to watch unauthorized entry from outside.
- c) 3.0 m high boundary wall should be provided around the installation to resist any unauthorized entry.

## **8.10 ENVIRONMENTAL AUDIT**

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In view of the high hazard potential of the plant, extreme care should be taken to maintain the safety needs of the installation. Safety and Environmental audits should be carried out regularly by a team consisting of experts from different discipline. The safety audit will include operating procedures, housekeeping, provision of firefighting and safety gadgets, mock drills etc.

### **Green Light Program**

It involves installation of energy efficient lighting system which reduces indirectly generation of oxides of Carbon, Nitrogen and Sulphur. However, there shall not be any compromise with required illumination at working places.

### **Golden Carrot Program**

This program involves super-efficient refrigeration cooling system and installation without the use of CFC. (No CFC)

### **Energy Star Program**

Use of energy efficient electrical appliances including computer etc. are adopted. The plant authority should pay proper attention to improve the working environment by adopting the principle of Ergonomics in the following line of action in order to maximize the working and skill capability of the work-men, the Environmental Management Plan considers the strategy and goal of Ergonomics. The application of ergonomics will reduce the Muscular Skeletal Disorder (MSD). Attempts shall be made to make the Working Environment to fit the Workmen instead of forcing a workman to adopt the Working Environment.”

### **8.11 COSTING OF EMP**

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Costing of EMP includes:

- Capital cost for installation of sock pit and septic tank and oil water separator for implementation other mitigation measures require for the project-
- Waste water and Air quality Monitoring
- Organizational management cost.

As mentioned earlier that no major source of environmental pollution from **Midland Knitwear Limited** occurred. So, capital investment cost required for organizational management cost for implementation of EMP.

Organizational management cost for implementation of EMP include-

- Micro trims authority use A one polar 50 m<sup>3</sup> pr hr. capacity STP
- Cost for technical personnel

Resource cost which consists of mainly laboratory equipment for monitoring.

TABLE 8-1 ENVIRONMENTAL MANAGEMENT ACTION PLAN FOR CONSTRUCTION PHASES

Environmental Impact	Mitigation Measures	Time Frame	Location	Responsibility
Air pollution	<ul style="list-style-type: none"> <li>➤ All materials transported to and from the construction site should be covered;</li> <li>➤ Temporary stockpiles of soil or other material should be covered or sprayed with water on a regular basis, particularly during dry or windy conditions;</li> <li>➤ Water should be used to suppress dust on temporary roadways and other exposed areas;</li> <li>➤ The project site should be surrounded by boundary wall;</li> <li>➤ Workers in the site should be issued with dust masks during dry and windy conditions;</li> <li>➤ Vehicles and other machinery should clear off mud before leaving the site;</li> </ul>	Throughout construction phase	Project site	Contractor
Soil Erosion and siltation	<ul style="list-style-type: none"> <li>➤ Prefer dry season for starting construction work in case of working in rainy season install barrier net;</li> <li>➤ Re-cover exposed soils with grass and other appropriate species as soon as possible;</li> <li>➤ Pile up spoil soil on flat surface away from drain;</li> </ul>	Throughout construction phase	Project site	Contractor

Noise and vibration	<ul style="list-style-type: none"> <li>➤ Construction activities that will generate disturbing sounds should be restricted to normal working hours;</li> <li>➤ If required local residents should be given noticed of indeed noise activities so as to reduce the degree of annoyances;</li> <li>➤ Worker use ear plug while working with noise device;</li> </ul>	Throughout construction phase	Project site	Contractor
Impact on ground water	<ul style="list-style-type: none"> <li>➤ Ensure minimum extraction of ground water;</li> <li>➤ Wastage of water should be avoided through monitoring;</li> </ul>	Throughout construction phase	Project site	Contractor
Solid waste	<ul style="list-style-type: none"> <li>➤ Provide space for temporary disposal of solid waste in the site and dispose of the waste properly;</li> <li>➤ Arrange adequate sanitation facilities for workers;</li> <li>➤ Follow up to ensure appropriate waste disposal and sanitation practices by contractor and construction workers;</li> </ul>	Throughout construction phase	Project site	Contractor
Impact on Biodiversity	<ul style="list-style-type: none"> <li>➤ Avoid unnecessary cutting of trees;</li> <li>➤ Allocate space for green belt development;</li> </ul>	Throughout construction phase	Project site	Contractor
Impact on traffic volume	<ul style="list-style-type: none"> <li>➤ Control vehicle movement in an organized way and follow local traffic instructions;</li> </ul>	Throughout construction phase	Material Transport Route	Driver

Fire/Explosion	<ul style="list-style-type: none"> <li>➤ Establish own firefighting system and maintain collaboration with government firefighting and civil defense department locally;</li> <li>➤ Organize fire drills and training for construction staff;</li> </ul>	Throughout construction phase	Project site	Contractor
Employment generation	<ul style="list-style-type: none"> <li>➤ Employment only construction workers;</li> </ul>	Throughout construction phase	Project site	Contractor
Occupational Health and safety risk	<ul style="list-style-type: none"> <li>➤ Create awareness of safety issues among workers and contractors;</li> <li>➤ Monitoring the practice of following safety guidelines by workers and contractors;</li> <li>➤ Ensure the use of appropriate PPE while working on the construction site and display proper safety signs in the project site;</li> </ul>	Throughout construction phase	Project site	Contractor

TABLE 8-2 ENVIRONMENTAL MANAGEMENT ACTION PLAN FOR OPERATION PHASES

<b>Environmental Impact</b>	<b>Mitigation Measures</b>	<b>Time Frame</b>	<b>Location</b>	<b>Responsibility</b>
Air pollution	<ul style="list-style-type: none"> <li>➤ Provide adequate ventilation and exhaust fan in the workplace;</li> <li>➤ Spry water on bare soil;</li> <li>➤ Maintain open air exhaust for generator and set catalytic converter and faulty engine would be repair as soon as possible;</li> <li>➤ Plant tree near boundary line or in the green area;</li> <li>➤ Monitoring SPM every 06 Months;</li> </ul>	Throughout Operation phase	Project site	Representative of project proponent
Solid waste	<ul style="list-style-type: none"> <li>➤ Apply 3R method for waste management of the project;</li> <li>➤ Train employees on waste control and disposal procedures;</li> <li>➤ Segregates wastes at source and stores in demarcated places;</li> <li>➤ Spent lube oil will be sold to DoE approved vendor only;</li> </ul>	Throughout Operation phase	Project site	Representative of project proponent
Noise and Vibration	<ul style="list-style-type: none"> <li>➤ Air plug will be provided to workers while near to noise generating equipment or working in noise area;</li> <li>➤ Conduct periodic maintenance of generator;</li> <li>➤ Will procure noise monitoring device and monitor noise condition in and outside the project premises;</li> </ul>	Throughout Operation phase	Project site	Representative of project proponent

	<ul style="list-style-type: none"> <li>➤ Monitoring noise conditions every 06 months;</li> </ul>			
Impact on soil or land	<ul style="list-style-type: none"> <li>➤ Maintain Cleanliness of the yard and store solid waste in waste bin;</li> <li>➤ Green belt development for enhancing the natural aesthetic of the site;</li> </ul>	Throughout Operation phase	Project site	Representative of project proponent
Impact on traffic volume	<ul style="list-style-type: none"> <li>➤ Control vehicle movement in an organized way and follow local traffic instructions;</li> </ul>	Throughout Operation phase	Project site	Representative of project proponent
Fire/Explosion	<ul style="list-style-type: none"> <li>➤ Establish own firefighting system and maintain collaboration with government firefighting and civil defense department locally;</li> <li>➤ Organize fire drill and training for construction staffs;</li> </ul>	Throughout Operation phase	Project site	Representative of project proponent
Occupational health and safety risk	<ul style="list-style-type: none"> <li>➤ Conduct job safety analysis;</li> <li>➤ Use of personal protective equipment such as hard helmet, musk, boot, eye glass, etc.;</li> <li>➤ Aware and train employees on using safety devices;</li> </ul>	Throughout Operation phase	Project site	Representative of project proponent
Statutory requirements	<ul style="list-style-type: none"> <li>➤ Meet all statutory requirements with DoE within the time frame;</li> </ul>	Throughout Operation phase	Project site	Representative of project proponent

TABLE 8-3 ENVIRONMENTAL MANAGEMENT ACTION PLAN

Issue/Concern	Potential negative environmental impacts	Mitigation measures	Environmental Monitoring	Responsible actors	Time frame
Water Pollution	<ul style="list-style-type: none"> <li>- Surface and ground water pollution</li> <li>-Occupational illness</li> </ul>	<ul style="list-style-type: none"> <li>- water filtration</li> <li>- Will establish septic tank and oil water separator and 50 m<sup>3</sup> per day STP</li> </ul>	<ul style="list-style-type: none"> <li>-Monitoring of water quality</li> </ul>	<ul style="list-style-type: none"> <li>-Authority &amp; workers</li> <li>- Health and safety officer</li> </ul>	<ul style="list-style-type: none"> <li>- Quarterly reporting</li> </ul>
Solid waste	<ul style="list-style-type: none"> <li>- Air, water and soil pollution</li> <li>-Poorly disposed waste may block drainage</li> </ul>	<ul style="list-style-type: none"> <li>- Proper solid waste management system</li> <li>- Sale of solid waste to third party.</li> <li>- Solid waste collection, storage and transportation system</li> <li>- Awareness and training campaign</li> </ul>	<ul style="list-style-type: none"> <li>- Regular monitoring of the solid waste management facilities</li> </ul>	<ul style="list-style-type: none"> <li>-Authority &amp; workers</li> <li>- Health and safety officer</li> <li>- Neighbors and</li> <li>- The general Public</li> </ul>	<ul style="list-style-type: none"> <li>-Must be keep inventory/daily register for solid waste</li> <li>- Quarterly reporting</li> </ul>

<b>Issue/Concern</b>	<b>Potential negative environmental impacts</b>	<b>Mitigation measures</b>	<b>Environmental Monitoring</b>	<b>Responsible actors</b>	<b>Time frame</b>
Air Pollution	<ul style="list-style-type: none"> <li>- Deterioration of indoor air quality</li> <li>-Occupational illness/health impact</li> </ul>	<ul style="list-style-type: none"> <li>- Proper stack height for generator</li> <li>-Regular maintain of Generators</li> <li>-Use of PPE</li> </ul>	-Monitoring of AIR quality	<ul style="list-style-type: none"> <li>-Authority &amp; workers</li> <li>- Health and safety officer</li> </ul>	- Half yearly Air quality monitoring (Only SPM)
Noise Pollution	<ul style="list-style-type: none"> <li>- Hearing loss</li> <li>-Reduced productivity and efficiency</li> <li>-Fatigue, headache, nervousness, irritability and high pretension resulting in accidents at workplace</li> </ul>	<ul style="list-style-type: none"> <li>- Implementation an effective noise control and hearing conservation program</li> <li>-Noise measurement</li> <li>-Providing suitable hearing protection to all workers</li> <li>-Training of workers</li> </ul>	-Determine Noise levels from time to time	<ul style="list-style-type: none"> <li>-Authority &amp; workers</li> <li>- Health and safety officer</li> <li>- Neighbors and</li> <li>- The general Public</li> </ul>	- Half yearly Noise level monitoring

Issue/Concern	Potential negative environmental impacts	Mitigation measures	Environmental Monitoring	Responsible actors	Time frame
Occupational hazards	<ul style="list-style-type: none"> <li>- Injury to employees on site</li> <li>-Injury to visitors</li> <li>- Reduced productivity</li> <li>- Plant and equipment damage</li> <li>-Negative corporate image</li> </ul>	<ul style="list-style-type: none"> <li>- Good and sound housekeeping practices</li> <li>-Provision of appropriate working tools and equipment</li> <li>-Use of PPE</li> <li>-Timely repair and maintenance of plant and equipment</li> <li>-Employee training</li> <li>-Use appropriate elevators and other lifting machinery</li> </ul>	<ul style="list-style-type: none"> <li>-Accident and incident records</li> <li>-Record of employee training</li> </ul>	<ul style="list-style-type: none"> <li>-Authority &amp; workers</li> <li>- Health and safety officer</li> </ul>	<ul style="list-style-type: none"> <li>- The mitigation measures proposed should be put in alongside project implementation and daily operations, continuously improved on and sustained throughout the operation life of the project.</li> </ul>

## CHAPTER 9 EMERGENCY RESPONSE AND DISASTER MANAGEMENT PLAN

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### 9.1 DISASTER IMPACT ASSESSMENT

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#### 9.1.1 OVERVIEW

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Accidental risk involves the occurrence or potential occurrence of some accident consisting of an event or sequence of events resulting in fire, natural calamities like flood and cyclone, explosion, or toxic hazards to human health and environment. Risk Assessment (RA) provides a numerical measure of the risk that a particular facility poses to the public. It begins with the identification of probable potential hazardous events in the industry and categorization as per the predetermined criteria. The consequences of major credible events are calculated for different combinations of weather conditions to simulate the worst possible scenario. These consequence predictions are combined to provide numerical measures of the risk for the entire facility. MCA stands for Maximum Credible Accident or in other words, an accident with maximum damage distance, which is believed to be probable. MCA analysis does not include quantification of the probability of occurrence of an accident. In practice, the selection of accident scenarios for MCA analysis is carried out based on Engineering judgment and expertise in the field of risk analysis, especially in accident analysis. The detailed study helps in plotting the damage contours on the detailed plot plan to assess the magnitude of a particular event. A disastrous situation is the outcome of fire, natural calamities, and explosion or toxic hazards in addition to other natural causes that eventually lead to loss of life, property, and ecological imbalances.

#### 9.1.2 METHODOLOGY OF MCA ANALYSIS

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The MCA analysis involves ordering and ranking various sections in terms of potential vulnerability. The data requirements for MCA analysis are:

- Operating manual
- Flow diagram and P&I diagrams
- Detailed design parameters
- Physical and chemical properties of all the chemicals
- Detailed plant layout
- Detailed area layout
- Past accident data

Following steps are involved in the MCA analysis:

- Identification of potential hazardous sections and representative failure cases.
- Visualization of release scenarios considering the type and the quantity of the hazardous material.

- Damage distance computations for the released cases at different wind velocities and atmospheric stability classes for heat radiations and pressure waves.
- Drawing of damage contours on plot plan to show the effect due to the accidental release of chemicals.

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### 9.1.3 PAST ACCIDENT DATA ANALYSIS

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Analysis of events arising out of the unsafe conditions is one of the basic requirements for ensuring safety in any facility. The data required for such an analysis has either to be generated by monitoring and/or collected from the records of the past occurrences. This data, when analyzed, helps in the formulation of the steps towards mitigation of hazards faced commonly. Trends in the safety of various activities can be evaluated and actions can be planned accordingly, to improve safety.

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### 9.1.4 HAZARD IDENTIFICATION

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Identification of hazards is an important step in Risk Assessment as it leads to the generation of accidental scenarios. The merits of including the hazard for further investigation are subsequently determined by its significance, normally using a cut-off or threshold quantity. Once a hazard has been identified, it is necessary to evaluate it in terms of the risk it presents to the employees and the neighboring community. In principle, both probability and consequences should be considered, but there are occasions where either the probability or the consequence can show to be sufficiently low or sufficiently high, decisions can be made on just one factor. During the hazard identification component, the following considerations are taken into account.

- Location of process unit facilities for hazardous materials.
- The types and design of process units
- The quantity of material that could be involved in an airborne release and
- The nature of the hazard (e.g., airborne toxic vapor or mists, fire, explosion, large quantities stored or processed handling conditions) is most likely to accompany hazardous materials spills or releases.

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### 9.1.5 FIRE AND EXPLOSION INDEX (FEI)

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Fire and Explosion Index (FEI) is useful in the identification of areas in which the potential risk reaches a certain level. It estimates the global risk associated with a processing unit and classifies the units according to their general level of risk. FEI covers aspects related to the intrinsic hazard of materials, the quantities handled, and operating conditions. This factor gives index value for the area which could be affected by an accident, the damage to property within the area, and the working days lost due to accidents.

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### 9.1.6 MCA ANALYSIS

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MCA analysis encompasses defined techniques to identify the hazards and compute the consequent effects in terms of damage distances due to heat radiation, toxic releases, vapor cloud

explosion, etc. A list of probable or potential accidents of the major units in the complexities arising due to the use, storage, and handling of the hazardous materials are examined to establish their credibility. Depending upon the effective hazardous attributes and their impact on the event, the maximum effect on the surrounding environment and the respective damage caused can be assessed. Hazardous substances, on release, can cause damage on a large scale. The extent of the damage is dependent upon the nature of the release and the physical state of the material. In the present report, the consequences for flammable hazards are considered and the damages caused due to such releases are assessed with recourse to MCA analysis.

Flammable substances on release may cause Jet fire and less likely unconfined vapor cloud explosion causing possible damage to the surrounding area. The extent of damage depends upon the nature of the release. The release of flammable materials and subsequent ignition result in heat radiation waves or vapor clouds depending upon the flammability and its physical state. Damage distances due to the release of hazardous materials depend on atmospheric stability and wind speed. It is important to visualize the consequence of the release of such substances and the damage caused to the surrounding areas.

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### 9.1.7 FIRE SCENARIOS

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Combustible materials within their flammable limits may ignite and burn if exposed to an ignition source of sufficient energy. On the proposed project, fire may cause from Gas cylinder explosion or electric short-circuit.

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## 9.2 DISASTER MANAGEMENT PLAN (DMP)

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### 9.2.1 APPROACH TO DISASTER MANAGEMENT PLAN

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Onsite Emergency or disaster is an unpleasant sudden event of such a magnitude that may cause extensive damage to life and property, due to in-plant emergencies resulting from deficiencies in operation, maintenance, design, and human error; natural calamities like flood, cyclone and earthquake; and deliberate and other acts of a man like sabotage, riot, war, etc. Every industry needs to have a well-documented Emergency Plan to meet any major untoward incident or disaster. Because of this, an approach to Disaster Management Plan (DMP) to tackle the emergencies, Proposed project has been delineated in the following sections. The roles and responsibilities of key personnel have also been defined in the plan.

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### 9.2.2 FORMULATION OF DMP AND EMERGENCY SERVICES

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Proposed **MIDLAND KNITWEAR LIMITED** will formulate a Disaster Management Plan for better and safe management of their plants. The DMP is related to the final assessment and it is the responsibility of the plant management document including the following elements.

- Assessment of the size and nature of the events foreseen and the probability of their occurrence;
- Formulation of the plan and liaison with authorities, including the emergency services.

- Procedures for raising the alarm and communications both within and outside the works;
- Appointment of key personnel and their duties and responsibilities, especially for works incident controller and works main controller;
- Emergency control center;
- Action on-site;
- Action off-site;

The plan is prepared to set out how designated people at the site of the incident can initiate supplementary action both inside and outside the works at an appropriate time. An essential element of the plan must be the provision for attempting to make safe the affected unit, for example by shutting it down. On a complex site, the plan includes the full sequence of key personnel to be called in from other sections or from off-site.

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### 9.2.3 NEED FOR DISASTER MANAGEMENT PLAN

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The proposed project will not produce any potentially hazardous material to human beings, flora, and fauna, and environment as a whole. Despite these, the possibility of accidents cannot be ruled out. Human errors and mechanical, electrical, instrumental, or system failures have, on occasion, led to severe disasters. Following are the general types of Emergency /Disaster that lead to the preparation of a disaster management plan:

- Fire from gas cylinder explosion
- Fire from electric short circuit
- Earthquake
- Flash flood
- Landslide

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### 9.2.4 OBJECTIVES OF DISASTER MANAGEMENT PLAN

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The purpose of DMP is to give an approach to detail organizational responsibilities, actions, reporting requirements, and support resources available to ensure effective and timely management of emergencies associated with production and operations on the site. The overall objectives of DMP are to:

- Ensure the safety of people, protect the environment and safeguard commercial considerations
- Immediate response to the emergency scene with effective communication network and organized procedures
- Obtain early warning of emergency conditions to prevent impact on personnel, assets, and environment
- Safeguard personnel to prevent injuries or loss of life by protecting personnel from the hazard and evacuating personnel from an installation when necessary.

- Minimize the impact of the event on the installation and the environment, by:
  - Minimizing the hazard as far as possible
  - Minimizing the potential for escalation
  - Containing any release
- To guide to help stock holders take appropriate action to prevent accidents involving hazardous substances and to mitigate adverse effects of accidents that do nevertheless occur.

### **9.3 EMERGENCY RESPONSE AND DISASTER MANAGEMENT PLAN**

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The initial response to an incident is a critical step in the overall emergency response. Like all other industries and installations. Project authorities must have adequate measures against accidents or incidents to meet the emergency. The purpose of having an Emergency Response Plan (ERP) is to:

- Assist personnel in determining the appropriate response to emergencies.
- Provide personnel with established procedures and guidelines.
- Notify the appropriate company emergency response team personnel and regulatory Govt. agencies.
- Manage public and media relations.
- Notify the next-to-kin of accident victims.
- Promote inter-departmental communications to ensure a “Companywide” Coordinated emergency response.
- Minimize the effects that disruptive events can have on company operations by reducing recovery times and costs.
- Respond to immediate requirements to safeguard the subtending environmental and community.

Generally, the initial response is guided by three priorities Ranked in importance these priorities are:

- 1. People**
- 2. Property**
- 3. Environment**

Emergency response procedures will identify who does what and when in the event of an emergency. Responsibility for who is in charge and their coordination of emergency actions shall be identified. Nature of emergency& Hazardous situations may be of any or all of the following categories:

#### **I. Emergency**

- Fire,
- Explosion
- Medical emergency,

#### **II. Natural Disasters**

- Flash Flood,

- Earthquake,
- Landslide

**III. External factors**

- Food poisoning/water poisoning
- Sabotage

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**9.3.1 SIX STEPS IN EMERGENCY RESPONSE**

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**First Step:**

This step determines the potential hazards associated with the incident, substance or circumstances and take appropriate action identify the type and qualities of dangerous goods involved and any known associated hazards.

It also determines potential hazards stemming from local conditions such as inclement weather water bodies etc. and ensure that the initial response team is aware of these conditions.

**Second Step:**

Determine the source/cause of the event resulting to the emergency and prevent further losses.

**Third Step:**

Conduct an assessment of the incident site for any further information on hazards or remedies.

**Fourth Step:**

Initiate redress procedures.

**Fifth Step:**

Report the incidence its nature cause impact applied redress procedures and any further assistance required etc. to the appropriate company, government and/or land owner.

**Sixth Step:**

Take appropriate steps with respect to hazards to wildlife, other resources and addressing public and media concerns and issues, as applicable. Response priorities are to protect human lives, property and the environment.

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**9.3.2 EMERGENCY RESPONSE AND FIRE MANAGEMENT PLAN**

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If a small fire cannot be extinguished with the use of a portable extinguisher or a fixed extinguishing system, or the smoke presents a hazard to the operator, then leave the fire area, ensure the fire department has been notified, and wait in a safe area for the fire department. Attempting to extinguish a fire is a voluntary act. Only persons who are properly trained and feel confident in the use of a portable extinguisher should contemplate their use. Improper use of a portable extinguisher can lead to severe injury or death.

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**9.3.2.1 TYPES OF FIRE**

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There are five types of fire such as

Class A – Ordinary combustibles (wood, paper, plastics, etc.)

Class B – Combustible liquids (oils, gas, cooking oil, etc.)

Class C – Electrical (energized equipment – appliances, wiring, etc.)

Class D – Combustible metals (aluminum, magnesium, zinc, etc.)

Class E – Commercial cooking equipment (Cooking oils, Animal fats, Vegetable fats)

It is extremely important to choose the properly rated fire extinguisher for the class of fire that is burning.

		Ordinary Combustibles	Wood, Paper, Cloth, Etc.
		Flammable Liquids	Grease, Oil, Paint, Solvents
		Live Electrical Equipment	Electrical Panel, Motor, Wiring, Etc.
		Combustible Metal	Magnesium, Aluminum, Etc.
		Commercial Cooking Equipment	Cooking Oils, Animal Fats, Vegetable Oils

FIGURE 9-1 PICTORIAL VIEW OF DIFFERENT TYPES OF FIRE

### 9.3.3 FIRE SAFETY RISK ASSESSMENT

A fire safety risk assessment is an organized and methodical look at the premises, the activities within the premises, the potential for a fire to occur, and the harm it could cause to the people in and around the premises. The prescribed process is available for inside or indoor fire risk assessment. The following fire risk assessment process can be followed and executed twice a year.

TABLE 9-1 FIRE RISK ASSESSMENT PROCESS

Fire Risk Assessment	
1	Identify fire hazards Identify: Sources of Ignition Sources of Fuel Sources of Oxygen
2	Identify People at Risk Identify: People in and around the premises People especially at Risk
3	Evaluate, Remove, Reduce and Protect from Risk Evaluate the risk to people from fire Remove or Reduce the Risks to people Detection and warning Fire-fighting

	Escape routes Lighting Signs and notices Maintenance
4	Record, Plan, Inform, Instruct, and Train Record significant findings and action taken Prepare an emergency plan Inform and instruct relevant people co-operate and co-ordinate with others Provide training
5	Review Keep assessment under review Revise where necessary
	<i>Source: Pronab Kumar Debnath, Project Paper, IDM, KUET</i>

## 9.4 EMERGENCY RESPONSE PLANS TO DISASTER

Emergency response plans are developed to address a range of plausible risk scenarios and emphasize the tasks required to respond to a physical event. The emergency response plan (ERP) for the proposed factory has been developed listing various actions to be performed in a very short period in a pre-determined sequence if it is to deal effectively and efficiently with any emergency, major accident, or natural disaster. The primary objective of the plan is to keep the loss of life, material, machinery/equipment damage, and impacts on the environment to a minimum.

### 9.4.1 ALARM SYSTEM

The alarm system varies and will depend on the size of the works area - simple fire bell, hand-operated siren – break open type, fire alarm, etc.

### 9.4.2 COMMUNICATION SYSTEM

Communication is a key component to control an emergency. The following communication system may be provided in the project:

- Walky-talky
- Telephone
- Cell phone
- Intercom/paging
- Runners (verbal or written messages)

### 9.4.3 SIREN FOR EMERGENCY

Siren for emergency should be different from a normal siren. The emergency siren should be audible to a distance of 5km radius. The emergency siren should be used only in case of an emergency.

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#### 9.4.4 ESCAPE ROUTE

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The escape route from each and every plant should be clearly marked and the authority already marked the emergency escape route clearly on every floor. The escape route is the shortest route to reach out of the factory area to the open area, which leads to assembly point. This route should be indicated on the layout plan attached to the on-site management plan.

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#### 9.4.5 EVACUATION

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All non-essential staff should be evacuated from the emergency site. As soon as the emergency siren rings the workers have to shut down the units and move to the assembly point. The shutdown procedure in case of emergency should be prepared and kept ready and responsible persons should be nominated for the purpose.

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#### 9.4.6 COUNTING OF PERSONNEL

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All personnel working in the industry should be counted. Time office persons should collect the details of personnel arriving at the assembly point. These should be checked with the attendances of regular workers; contract workers present in the site on the day of emergency. The accident control should be informed and arrangement should be made for searching missing persons in the emergency affected area. The employees address, contact number of next to kin should be maintained in the time office so that during emergency relatives of those affected due to emergency may be informed accordingly. Information in respect of emergency should be given to the media and other agency.

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#### 9.4.7 ALL CLEAR SIGNAL

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After control of emergency the work incident controller will communicate to the works main controller about the cessation of emergency. The main controller can declare all clear by instructing the time office to sound “All Clear Sirens”.

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#### 9.4.8 EMERGENCY FACILITIES

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The following facilities should be provided to tackle any emergency at any time.

- ✓ Fire protection and firefighting facilities
- ✓ Emergency lighting and standby power
- ✓ Emergency equipment and rescue equipment
- ✓ Breathing apparatus with compressed air cylinder
- ✓ Fire proximity suit

- ✓ Resuscitator
- ✓ Water gel blanket
- ✓ Low-temperature suit
- ✓ Fire aid kit
- ✓ Stretchers

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## CHAPTER 10 PUBLIC CONSULTATION

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### 10.1 GENERAL

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The process of public participation and consultation was endorsed in the United Nations Conference on the Environment and Development (UNCED) in 1992 through one of the key documents of the conference - Agenda 21. Stakeholder consultation is a means of involving all stakeholders in the project's decision-making process to address their concerns, improve project design, and give the project legitimacy. Stakeholder consultation, if conducted in a participatory and objective manner, is a means of enhancing project sustainability.

Listening to stakeholder concerns and feedback can be a valuable source of information that can improve project design and outcomes and help a company to identify and control external risks. It can also form the basis for future collaboration and partnerships. For stakeholders, a company's consultation process is an opportunity to get information, as well as to educate company staff about the local context in which a project will take place, to raise issues and concerns, ask questions, and potentially help shape the project by making suggestions for the company to consider and respond to.

**The Project Director will conduct a public consultation as part of the environmental assessment process. This will occur following the publication of a formal notice in a widely circulated newspaper, ensuring that all relevant stakeholders and the general public are informed about the upcoming project. Before the consultation, a draft copy of the Environmental Impact Assessment (EIA) report will be submitted to the Department of Environment (DoE) for review. This process aims to foster transparency, gather public input, and address any environmental concerns, supporting informed decision-making for the project's development.**

## CHAPTER 11 ENVIRONMENTAL MONITORING PLAN

### 11.1 MONITORING REQUIREMENT

Environmental monitoring is an essential tool in relation to Environmental Management System as it provides the basic information for rational management decisions. The prime objectives of monitoring are –

- To check on whether mitigation and benefit enhancement measures are actually being adopted and are providing effective in practice.
- To provide a means whereby impacts that were subject to uncertainty at the time of preparation of IEE, or which were unforeseen, can be identified, and steps to be taken to adopt appropriate control measures.
- To provide information on the actual nature and extent of key impacts and the effectiveness of the mitigation measures which, through a feedback mechanism, can be taken into account in the planning and execution of similar projects in the future.

There are two basic forms of monitoring:

- Visual observation or checklist, coupled with inquiries
- Physical measurement of selected parameters.

In the case of industrial projects in general, monitoring is done by physical measurement of some selected parameters like air, water, soil, noise, etc. It should be mentioned here that the monitoring program should be such so that it can ensure compliance with national environmental standards. The importance of this monitoring program is also for ensuring that the project does not create adverse environmental changes in the area and providing a database of operations and maintenance, which can be utilized if unwarranted complaints are made.

### 11.2 MONITORING INDICATORS

Environmental monitoring requires set of indicators that could be conveniently measured, assessed and evaluated periodically to observe the trends of change in base line environment quality. A list of parameters to be tested, sample number and sampling frequency are given in Table-11.1. Here it may be mentioned that parameters are selected according to the requirement of DOE as indicated in the environment quality standard (EQS) for concerned industries.

TABLE 11-1 MONITORING PARAMETER AND FREQUENCY

Issue	Parameters	Location	Monitoring Frequency
Stack Emissions Generator	SPM	Final exhaust	Half yearly
Ambient air quality	PM10	Around the project site	Half yearly

Noise level	Noise at different locations at day & night	Around the project site	Half yearly
Drinking water quality	Total Coliform	Drinking water outlet	Half yearly
Work place noise level	Noise level at work place	Noise at different locations at work place	Half yearly
Sewage Treatment Plant outlet parameter	pH, BOD <sub>5</sub> at 20°C, COD, Suspended Solids (SS), Oil & Grease, Nitrate (NO <sub>3</sub> ), Phosphate (PO <sub>4</sub> ), Total Coliform	STP outlet	Half yearly

To be an environmentally acceptable project, the proposed project should have its own environmental monitoring unit/cell with trained manpower with the necessary equipment and other logistics along with the required budget. **Midland Knitwear Limited** should develop a working relationship with the Department of Environment (DOE) by undertaking a joint monitoring program to monitor the above parameters. environmentally acceptable, the proposed project should have its own environmental monitoring unit/cell with trained manpower, the necessary equipment, and other logistics, along with the required budget. Midland Knitwear Limited should develop a working relationship with the Department of Environment (DOE) by undertaking a joint monitoring program to monitor the

### 11.3 MONITORING PLAN

All monitoring activities should be carried out by the plant Authority unless specified otherwise. A network should be formed with the workers and employees of the plant for specific purposes.

#### Water Pollution

- Monitor and control wastewater discharge to the natural drain.
- Monitor compliance of water quality with DoE Standards during construction and operational periods.

TABLE 11-2 DOE WATER QUALITY STANDARD FOR INLAND SURFACE WATERS

Parameter	Unit	Recreation activity	Fisheries
pH	-	6.5-8.5	6.5-8.5
BOD mg/l	mg/L	3 or less	6 or less
DO mg/l	mg/L	5 or more	5 or more
Total Coliform	No. /100mL	200 or less	-

TABLE 11-3 SEWAGE WATER PARAMETER

Parameter	Unit	Standard Limit
Temperature	Degree Centigrade	30
pH	-	6-9
BOD <sub>5</sub> at 20°C	mg/l	30
COD	mg/l	125
Suspended Solids (SS)	mg/l	100
Oil & Grease	mg/l	10
Nitrate (NO <sub>3</sub> )	mg/l	50
Phosphate (PO <sub>4</sub> )	mg/l	15
Total Coliform	Number/100 ml	1000

### Air Quality

Monitor actions taken by the plant authority to reduce dust and meet DoE guidelines.

TABLE 11-4 DOE STANDARDS FOR AIR

Categories of Area	Microgram per cubic meter			
	SPM	Sulphur dioxide	Carbon monoxide	Nitrogen
Industrial and Mixed	500	120	5000	100
Commercial and Mixed	400	100	5000	100
Residential and rural	200	80	2000	80
Sensitive	100	30	1000	30

### Noise Pollution

Monitoring actions taken by the authority of plant to reduce noise and meet DoE guidelines.

TABLE 11-5 DOE STANDARDS FOR SOUND

Category of areas	Standard determined at dBa unit	
	Day (6AM-9PM)	Night (9 PM-6AM)
Silent zone	45	35
Residential area	50	40
Mixed area	60	50
Commercial area	70	60
Industrial area	75	70

### Solid Waste Management

Solid waste management system should be well developed to carry the hazardous and non-hazardous waste. Solid waste collection, transportation and dumping in proper way should be ensured by the authority of the **Midland Knitwear Limited**

### **Proper Drainage**

Proper drainage system should be maintained for both the sewerage water, household water and storm water. Separate drainage system should maintain for the sewerage water and household and storm water.

### **Health and Safety**

Monitor Environmental compliance and provide health and safety measures to the workers during operational period.

**CHAPTER 12 COST ESTIMATION FOR ENVIRONMENT  
MITIGATION MEASURES AND MONITORING**

**12.1 ENVIRONMENT MANAGEMENT COST**

Most mitigation measures require contractors/project authorities to accept good practices, which should be part of the usual procedures, so the cost of compliance is unlikely to be high. Relaxation, which is the proponent’s and the contractor's responsibility, is given as part of the project's management. The following table shows the cost estimate of environmental mitigation measures and annual cost monitoring.

TABLE 12-1 COST ESTIMATION OF MITIGATION MEASURE

SI No	Potential Environment Management Measure	Cost (Annual)
<b>Preconstruction Phase</b>		
01	Land acquisition, Losses of land, livelihood and income source	Already been done by Proponent
02	Resettlement Action Plan & Monitoring	No resettlement Need
03	Side boundary wall	Included in construction cost
<b>Construction Phase</b>		
04	Provision of Personal Protective Equipment to all labor involved in the construction of proposed off-site developments	Included in construction cost
05	Construction of Labor camps	Included in construction cost
06	Construction of Toilets & Septic Tanks/Soak Pits	Included in construction cost
07	Construction of Temporary stormwater drainage system	Included in construction cost
08	Safety & Quality inspections	Included in construction cost
09	Construction of oil water separator tank	Included in construction cost

TABLE 12-2 ENVIRONMENTAL MONITORING COST

<b>Parameters</b>	<b>Est. Number of Samples/Sites (Per year)</b>	<b>Unit cost @ (BDT)</b>	<b>Total cost (BDT)/year</b>
Ambient air quality (SPM; SO <sub>x</sub> ; NO <sub>x</sub> )	4	12,000.00	48000.00
Surface water quality: BOD, COD, DO, pH, TDS, TSS, Ammonia, Nitrate, TC, FC, heavy metals, and other pollutants	4	13,000.00	52000.00
Groundwater quality/Drinking Water (Arsenic, Iron, Coliform, etc.)	4	4,000.00	16000.00
Noise level	12	1,600.00	19200.00
Quality of effluent	12	5000.00	60000.00
Establishment of Greenbelt	-	-	200000.00
<b>Total cost per year</b>			<b>395200.00</b>

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## CHAPTER 13 CONCLUSIONS AND RECOMMENDATIONS

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### 13.1 CONCLUSIONS

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The **Midland Knitwear Limited** is a private owned company intends to build and operate Commercial project at **52/03, Block- E, Shantinagar, Shiddhirganj, Narayanganj City Corporation, Narayanganj.**

The environmental analysis has revealed that the project can be set up according to the proposed design and configuration in the proposed site and location. The environmental impacts are limited, whereas the benefits of the project outweigh the negative impacts.

The impact analysis revealed that, noise and dust will be the major environmental impact for the construction of the project. Adverse impacts on workers' health & safety due to construction and operation were found very negligible among all the adverse impacts. However, these impacts can be reduced to a negligible amount by proper Management measures.

It is expected that the construction and operation of the proposed project namely **Midland Knitwear Limited** will comply with all the guidelines provided by the Department of Environment (DoE).

#### MISSION

- “To be one of the Top Global Players in the specialized Fabrics Dyeing Finishing and Knitting sector, bringing inspiration and innovation to product we create.”
- To innovate, to lead, to enhance, to provide best-value Fabrics Dyeing Finishing and Knitting and services to global customers.
- To make a difference through our variation of product to stay ahead of fashion trends, market changes and the latest technology.
- Being innovative, cost effective and globally competitive
- Ensuring in time delivery with right quality
- Committing cleaner and greener environment.

#### VISION

- Become the most preferred Fabrics Dyeing Finishing and Knitting manufacturer for global clothing companies with the philosophy of corporate sustainability.
- M. Shamsuzzaman
- Managing Director, Micro Fibre Group

Micro Fibre hit the road in 1997. The Multi Fibre Arrangement (MFA) expired in 2004 putting many readymade garments factories in Bangladesh into survival threat. But we survived the challenge and soon proved our potential. Even early in this current decade, when the entire western apparel market across America and Europe went into depression, we continued to register a double-digit growth. For long, we have been maintaining an average yearly export growth of about 15 percent. Conservatively projected, Micro Fibre is going to cross the US\$300 million export

mark by the year 2022. Today, we are considered as a model of success as a one-stop fully vertical knitwear manufacturer and exporter from Bangladesh. We believe our success is, in fact, a fabulous gesture of reciprocation from our valued clients – the globally reputed apparel buyers, who are actually the ultimate ambassadors of our mission. We sincerely serve them in terms of quality, timely delivery, value for the price, quick adaptation to changes in the world apparel markets and, of course, in terms of eco-friendliness as well as other social and ethical values and practices they adhere to. We have learnt that if we listen to the clients first, they will listen to us too. We practice accordingly. We are confident to envisage a globally recognized status of ours as a leading knitwear supplier well before 2025. Yes, we are working hard for continued progress powered and shared by all in our relationship chain.

### **13.2 RECOMMENDATIONS**

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Given that the potential impacts are somewhat significant to environmental degradation, this EIA report presents a ‘findings of some significance impacts’ that can be effectively mitigated. It is therefore recommended that the proposed development project be allowed to proceed on the strict condition that the impact mitigation measures highlighted below:

- The proponent will comply with occupational health and safety, especially in the construction phase and operation phase.
- The plant authority should provide appropriate personal protective equipment (PPE) and they should strictly monitor this PPE during the construction period.
- Follow the Management measures suggested in chapter 7 during the construction and operation of the project.
- **Midland Knitwear Limited** should undertake and expanded the tree plantation program inside the project area and surrounding environment also built green belts.
- Disaster Management Plan should be prepared in case of emergency situations.
- A Fire safety plan needs to be prepared in case of emergency situations.
- The project proponent should conduct a post-operational environmental study to evaluate the environmental impacts of the project and compare the findings with the outcomes of this EIA report.
- The authority should maintain the regular incident register and proper corrective action plan.
- The plant authority should install an automatic fire/heat detecting system in each area.
- The authority should declare the project a “no smoking zone”.
- The factory authority should arrange regular mock drills by the firefighting cells/groups.

- Arrange awareness programs for the workers and employees for earthquake and landslide emergencies; also, arrange proper training for the employees about the importance of safety codes.
- They should regularly monitor and record the project's drainage system and also build ETP and oil-water separators to treat wastewater.
- The impact due to air emission, there are no environmental issues of sensitive nature, which might have any potential of ill severe effects due to the plant in this area. Since it is understood that the authority is committed to taking necessary steps to address any environmental problems, the selected location of Midland Knitwear Limited is acceptable for the present project. Therefore, the authority should regularly monitor and record the ozone-depleting substances (ODS) and Green House Gases (GHGs) from AC, refrigerators and other machinery in the facility premises.
- The company has to appoint skilled personnel to care for and advise about the Environmental Management System.
- The authority should develop an Environmental Management System Team in the facility.
- The project proponent should conduct a post-operational environmental study to evaluate the project's environmental impacts and compare the findings with the outcomes of this EIA report.

However, no development can be expected without any adverse impact on the environment. The beneficial impacts on the nation as well as human beings would only be meaningful and sustainable development would only be possible if adverse impacts are minimized through strict maintenance and control measures as mentioned for this project. All this would need vigilant care and cost money, and the project authority should take these into consideration.

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