



Final Environmental and Social Impact Assessment Report

For proposed DBL
Industrial Park,
Maulvibazar,
Bangladesh

Feb 2021

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Abbreviation & Glossary

%	Percentage
°C	Degree Celsius
µg/m ³	microgram per cubic meter
ACGIH	American Conference of Governmental Industrial Hygienists
ADB	Asian Development Bank
AEZ	Agro Ecological Zone
AMSL	Above Mean Sea Level
BBS	Bangladesh Bureau of Statistics
BEZA	Bangladesh Economic Processing Zone Authority
BMD	Bangladesh Meteorological Department
BNBC	Bangladesh National Building Code
BOD	Biochemical Oxygen Demand
BWDB	Bangladesh Water Development Board
CaCO ₃	Calcium Carbonate
CETP	Common Effluent Treatment Plant
CH ₂ O	Formaldehyde
Cl ₂	Chlorine
Cm	Centimetre
CO	Carbon monoxide
CO ₂	Carbon dioxide
COD	Chemical Oxygen Demand
CPR	Common Property Resources
dB	Decibel
DBL	Dulal Brothers Limited
DG	Diesel Generator
DO	Dissolve Oxygen
DOE	Department of Environment
DPHE	Department of Public Health and Engineering

EC	Electrical Conductivity
ECA	Ecologically Critical Area
ECC	Environmental Clearance Certificate
ECR	Environment Conservation Rules
EHS	Environment, Health and Safety
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPP	Emergency Preparedness Plan
ESIA	Environmental and Social Impact Assessment
ETP	Effluent Treatment Plant
EU	European Union
EZ	Economic Zone
FDI	Foreign Direct Investment
FGD	Focus Group Discussions
FMD	Foot & Mouth Disease
GDP	Gross Domestic Product
GIS	Geo-Informatics System
gm	Gram
GoB	Government of Bangladesh
GSB	Geological Survey of Bangladesh
GSHAP	Global Seismic Hazard Assessment Program
H ₂ S	Hydrogen sulphide
ICT	Inland Container Terminal
IEE	Initial Environmental Examination
IWM	Institute of Water Modeling
JICA	Japan International Cooperation Agency
Kg	Kilogram
KV	Kilo Volts

LPG	Liquefied Petroleum Gas
m	Meter
MBR	Membrane Bio Reactor
MLD	Million Litres Per Day
MMSCFD	Million standard cubic feet per day
MSW	Municipal Solid Waste
MVA	Mega Volts Ampere
NaCL	Sodium Chloride
NGL	Normal Ground Level
NH ₃	Ammonia
NNE	North-North-East
NO	Nitric oxide
NO ₂	Nitrogen dioxide
NO _x	Nitrogen Oxides
O ₃	Ozone
PGCB	Power Grid Company, Bangladesh
PIU	Project Implement Unit
PM 10	Particulate Matter 10
PM 2.5	Particulate Matter 2.5
PPE	Personal Protective Equipment
PPP	Public Private Partnership
PVC	Polyvinyl chloride
RBC	Rotating Biological Contactors
RCC	Reinforced Cement Concrete
REB	Rural Electrification Board
RHD	Roads and Highways Department
RMG	Readymade Garments
SBR	Sequencing Batch Reactor
SO ₂	Sulphur dioxide
SPM	Suspended Particulate Matter
SRDI	Soil Resource Development Institute

STP	Sewage Treatment Plant
TDS	Total Dissolved Solid
ToR	Terms of Reference
UASB	Up-flow Anaerobic Sludge Blanket
UG	Under Ground
USA	United States of America
VOC	Volatile Organic Compound

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Executive Summary

Project Background

Government of Bangladesh (GoB) has adopted a proactive approach to promulgate investment within the country and foster organized industrialization. In tandem with this initiative, economic zone (EZ) regime ushered in, and Bangladesh Economic Zones Authority (BEZA) was conceptualized. BEZA is the nodal agency mandated for economic zone development in the country. BEZA in support with World Bank is implementing Private Sector Development Support Project (PSDSP) to upkeep pilot EZ projects under the new EZ regime.

DBL Industrial Park Limited is a Private Limited Company, playing role as a “Developer” in the project. The project is envisioned to develop a portion of the Shreehatta Economic Zone complying infrastructural and community facilities aligning the prime objective of Bangladesh Economic Zone Authority (BEZA) to attract investors and for large manufacturing and service industry.

The project site of DBL Industrial Park is located at Sherpur and Bamongaon Mouza, Maulvibazar Sadar upazila, Moulvi Bazar District, Sylhet Division.

The zone will have access to utilities such as power, water and gas which are critical enablers for development of economic zone. There is adequate supply of unskilled labor from the rural areas in the vicinity, however skilled and semi-skilled labor needs to be procured from the nearby urban agglomerations since there is a dearth of quality educational infrastructure in the region.

Project Objective

The project objective is to develop a multi sector Economic Zone in the Maulvibazar Sadar Upazila, Maulvibazar District of the Sylhet Division. The aim of setting up an EZ is to develop various industries in the region along with excellent state-of-the art infrastructure facilities and professional management to attract and support investments in industrial sectors.

The type of industries to be accommodated within EZ are as follows-

- | | | |
|---------------------------------------|---|--|
| <i>1. Spinning Mills</i> | <i>4. Glass Processing Factory</i> | <i>7. Aluminium Ball</i> |
| <i>2. Garments Accessories</i> | <i>5. Ceramic Tiles Factory</i> | <i>8. Sanitary Ware</i> |
| <i>3. Glass Factory</i> | <i>6. Ceramic Frit</i> | <i>9. Abrasive Tool Factory</i> |

Project Description

Site for the EZ has been selected for development of economic zone. Scope of the proposed project is to develop EZ and on-site facilities for upcoming EZ zone. These EZ facilities will be developed by DBL Industrial Park Limited. Proposed development will help in improving the infrastructure of the EZ area. Proposed interventions at the selected site are given below:

- **Site development & Land Filling**– The average natural ground level for the proposed EZ was +6.66 m AMSL level. To avoid inundation during monsoon season, the land

filling of 3.34 m above the existing natural ground level is considered. The finished ground level for the proposed EZ will be around +10.0 m from above Mean Sea Level. An average depth of 9 feet to 13 feet of land filling has been envisaged for the proposed EZ area.

- Boundary Wall Construction
- Road, Footpath and Master drainage line construction
- Creation of industrial Plots (09 no's)
- Administrative & residential building
- Development of water supply, Electricity supply and Gas supply network
- Development of sewer system network
- Development of STPs, RMS Gas station, Mini Fire Office, Water body

Project Site

The project site of DBL Industrial Park is located at Sherpur and Bamongaon Mouza in Maulvibazar Sadar upazila of Moulvi Bazar District in Sylhet Division of Bangladesh.

The proposed EZ site is well connected with Dhaka – Sylhet national highway. Both Sylhet Dhaka highway and Sylhet Maulvibazar roads will be access road for the site. There are two railway stations near the EZ site – Sylhet Station (35 Km from the site) and Sreemangal Station (43 Km from site). Osmani International Airport in Sylhet is about 55 Km from the site.

Proposed EZ spread over an area of 167.6 acres is a part of Shreehatta EZ (total Area 353.53 acres). The location of proposed EZ is furnished in below figure.

Figure: Location of Proposed EZ Site



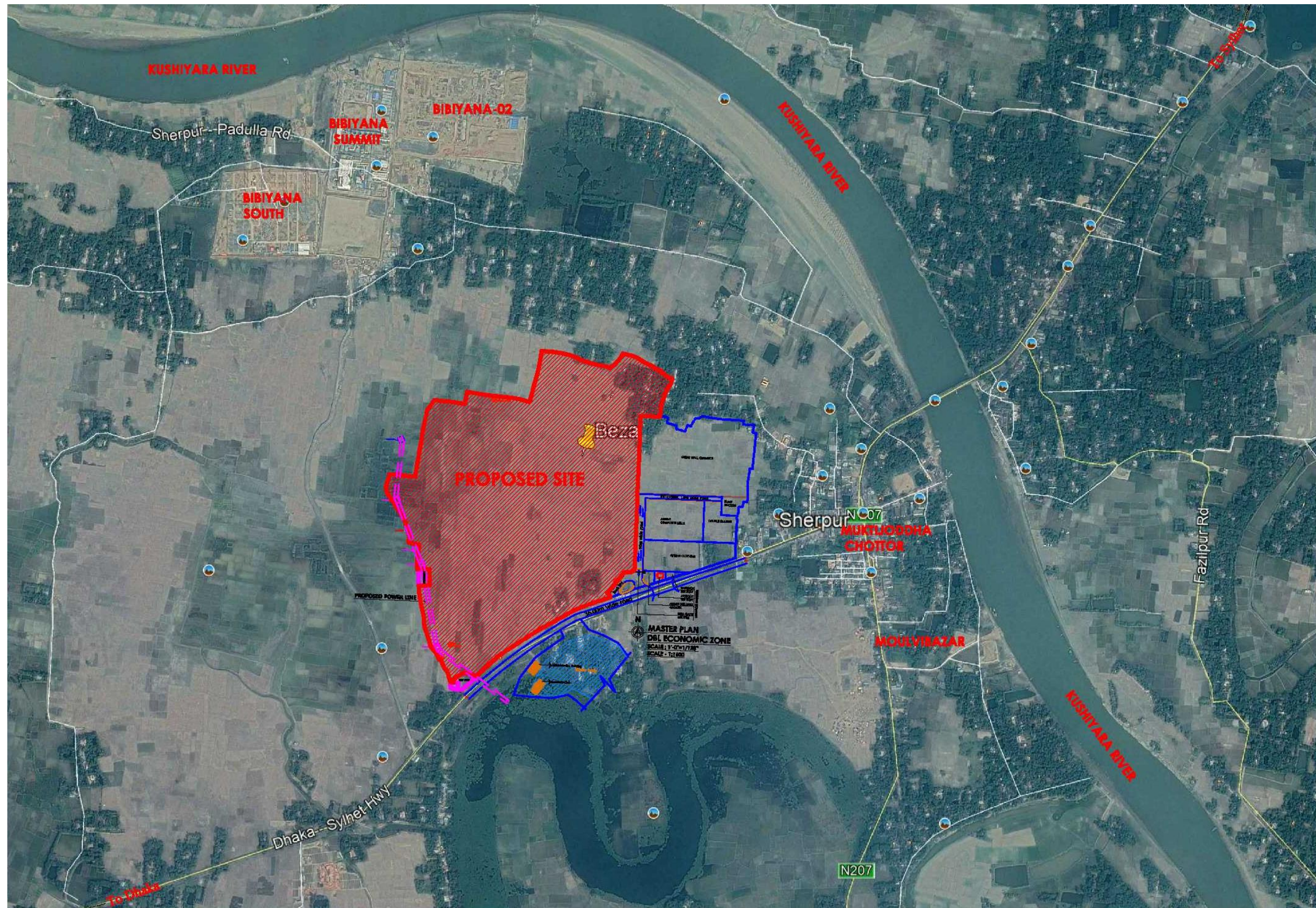
Source: PMO Library, Dhaka & PwC Analysis

Table: Snapshot of EZ Site Surrounding

Parameters		Details
Site co-ordinates		Latitude: 24°37'29.37"N Longitude: 91°39'58.22"E
Site Surrounding Features	East	BEZA site
	West	Open land
	North	Open land
	South	Dhaka-Sylhet highway
Total area of the EZ		167.6 Acores
Ownership of Land		DBL Industrial park Limited (Through lease from BEZA)

Source: PwC analysis

Figure: Location of the proposed EZ shown on Google Earth



Source: DBL

Baseline Environment

Meteorology

The project area lies in the North-Eastern climate zone of the country and have tropical monsoon climate. There are three main seasons, i.e. Southwest Monsoon (May to October), Northeast Monsoon (November to February) and pre-monsoon season (March to April). Meteorological condition has been established using data on different metrological parameters accumulated from Bangladesh Meteorological Department for Sreemangal station.

As a part of ESIA study, long-term climatological information for the following parameters have been collected from Bangladesh Meteorological Department (BMD) and furnished in the report-

- Temperature
- Humidity
- Rainfall
- Evaporation
- Wind Speed and Direction
- Sunshine Hours

Natural Hazards

Since the Maulvibazar district is not coastal area so there are no threats of tropical cyclones or tidal flooding in the area.

Major River in the Proposed Site is Kushiya River. The River generally floods in rainy season, i.e. middle May to October. Between the River Surma (flowing to the Northern side of Kushiya) and Kushiya, there are many internal draining depressions (haors), meandering flood channels and abandoned river courses, which are widely flooded every monsoon season.

Land Use

Land use land cover study has been carried out for 10 km radius area of the EZ Site. The land use of Proposed Site covering 10Km radius of EZ site is predominantly agricultural (73.48%) followed by Rural Settlement (19.78%), Water Bodies (6.38%), Urban Areas (0.18%). Major water body within 10 km Proposed Site are river Kushiya, the water body namely Gong (a large water body to the southern side of the proposed site), River Manu and other Beels and Khals.

Environmental Monitoring

The information on the existing environmental conditions of the proposed project site and of its close vicinity have been generated through primary baseline monitoring and secondary

sources with respect to physical, biological and socio-economic environment. A zone of 10 km area around the EZ is considered as project influence area.

Surface Water System

Major water body within 10 km Proposed Site are river Kushiya, the water body namely Gong (a large water body to the southern side of the proposed site), River Manu and other Beels and Khals. Kushiya river is perennial river. Average depth of the Gong is 15 feet.

Kushiya River is one of the trans-boundary Rivers of Bangladesh. The Kushiya River originates from India. The Kushiya passes through the Eastern side and it is 1.5 kilometer away from the project site. The flood period is generally from the last week of May to the middle of October. The Kushiya River is approximately 150 m wide when full and the average depth is about 12 m. The slope of the river bed is higher in Kushiya which is 100mm/Km. The Manu river, which originates in the Tripura hills and follows a meandering north-westerly course between Rajkandi and Ita hills and along the northern face of Balisira range past Maulvibazar it meets the Kushiya river near Bahadurpur. The Manu has a catchment area of 1000 sq. kilometers. Monsoon floods and flash floods occur in the area. Flash floods occur during April to May in the area. As Manu river is far away from the project site, Flash Flood and Monsoon Floods will not affect the project area.

Ground Water Scenario

Project site lies Surma Basin. Soils of the region are grey silty soils on the ridges and clayey in the basins. Aquifers of the region are confined and semi-confined. Depth of the ground water in the area varies from 4-5 mbgl during dry season. Due to the nature of strata area has very high potential for ground water recharge. Potential recharge varies from 1001-2500 mm. According Ground Water Zoning Map, the water level lies between 0-5.3 m below from ground level.

Biological Environment

There is no protected area or Ecologically Critical Area located within the Proposed Site of 10Km radius from proposed site boundary. Also, there is no presence of forest land within the Proposed Site. The proposed site and Proposed Site spread across Bio-ecological Zones 5a: Haor Basin and 4d: Surma-Kushiya Flood Plains of the country. The nearest Ecologically Critical Area and Protected area from proposed project site are Hakaluki Haor and Lawachara National Park is located at a distance of 37 Km and 20 Km respectively.

Agricultural Resources

The proposed site area is not used for agriculture purposes. The entire land parcel is vacant.

Livestock and poultry

The proposed project area is barren and free of any encumbrances. There are no livestock or poultry farms in the project area

Fisheries

No pisciculture or fish culture are being practiced within the proposed site area. The EZ will not hamper anyone who is depending on the project site Fisheries nor any fresh water source will be affected.

Socio-economic

The project does not have adverse impacts on the socio-economic status of the people. The proposed site area does not have any inhabitant / homesteads. The site also does not have residential settlements, structures, CPRs, commercial and business outlets. The land presently does not provide any means of livelihood to any of the residential settlement around the proximity of the subject side. Therefore, no adverse socio-economic impacts could be foreseen because of this project.

Rather, Employment generation, both direct and indirect, through EZ is expected to have a significant impact on economic development and poverty reduction in the area.

Impacts and Mitigation

The environmental impacts assessment was carried out considering present environmental setting of the project area, and nature and extent of the proposed activities. The proposed project involves development of EZ for upcoming various types of industries. Potential environmental impacts associated with EZ are classified as:

- impacts during design and construction phase and
- Impacts during operation phase.

The anticipated impacts and the proposed mitigation measures are outlined in the below tables

Table: Environmental Impacts and Mitigation Plan: Preconstruction & Construction Phase of EZ Development

Impact	Mitigation Measures
Setting up of construction camps/labour camps	• The construction camps should be at least 500 m distance from habitations from the nearest settlements to avoid conflicts and stress over the infrastructure facilities with the local community. • Location for stockyards for construction materials will be identified at least 1 km from water sources • The living accommodation and ancillary facilities for labour shall be erected and maintained to standards and scales approved by the resident engineer • All sites used for camps will be adequately drained. There should not be any risk of periodic flooding, nor located within 300 feet of pools, sink holes or other surface collections of water • The camps will be located such that the drainage from and through the camps will not endanger any domestic or public water supply • All sites will be graded, ditched and rendered free from depressions such that water may get stagnant and become a nuisance • Construction camps shall be provided with sanitary latrines (1 per 25 pax), bathing facility and urinals.

Impact	Mitigation Measures
	• Sanitary latrines shall be under cover and so partitioned off as to secure privacy, and shall have a proper door and fastenings • Adequate and suitable facilities for washing clothes and utensils shall be provided and maintained for the use of contract labour employed therein. • Sewerage drains will be provided for the flow of used water outside the camp. • Drains and ditches will be treated with bleaching powder on a regular basis. • The sewage system for the camp will be properly designed, built and operated so that no health hazard occurs and no pollution to the air, ground or adjacent watercourses takes place. • Clean potable drinking water facility should be provided at the site and the water quality should be monitored regularly • Crèche facility should be provided for children if female workers are employed • First aid facilities should be made available at construction camp. First aid box should contain small, medium and large sized sterilized dressings, sterilized burns dressings, 2 % alcoholic solution of iodine, bottle containing sal volatile, snakebite lancet, bottle of potassium permanganate crystals, scissors, Ointment for burns & surgical antiseptic solution • 1 first aid box should be available per 50 labour • A person trained in first-aid treatment should be made in charge who will always be readily available during emergency • A suitable motor transport shall be kept readily available to carry injured or ill person to the nearest hospital.
Landfilling	• Residential facility or sensitive facilities like hospitals, schools etc. shall not be located in downwind direction of the identified sites for getting landfilling material. • The soil used for landfilling should have similar characteristics to the native soil and free of any type of contamination.
Soil Erosion and Sedimentation control	• Contractor should plan the activities so that no loose earth surface is left out before the onset of monsoon. • Top soil along the road side should be stripped and kept under covered shed for plantation • After the construction activity is over, top soil will be utilized for landscaping activity. • To avoid soil compaction along the transportation routes, only identified haul roads would be used for transportation. • Turfing of low embankments and plantation of grasses and shrubs should be done in slope stabilization. • Soil erosion checking measures as the formation of sediment basins, slope drains, etc., should be carried out.
Disposal of Debris and any waste generated	• Waste from construction camp should be segregated at site. Food/wet waste should be composted in pit at the site, recyclable should be send to recyclers if any and rejected waste should be disposed regularly through responsible agency in the area • Dustbins should be provided at the site and construction camps to prevent littering of waste • Storage area of minimum 2 days should be provided at construction camp for storage of the waste generated from labour camps

Impact	Mitigation Measures
	• Construction debris should also be segregated at the site. This debris should be used for filling to the extent possible. Recyclable waste should be sold in the local markets and reject waste should be sent to the identified debris disposal site • All arrangement for transportation during construction including provision, maintenance, dismantling and clearing debris, where necessary will be considered incidental. • Construction debris should be stored under covered sheds on paved surfaces to prevent leaching • Utmost care shall be taken to ensure safe collection, transport and disposal of construction waste and debris.
Dust Generation & Air Emission	• Vehicles delivering materials should be covered with tarpaulin to reduce spills and dust blowing off the load. • Compaction of prepared site to re-strain the fugitive emissions. • Water should be sprayed in the cement and earth mixing sites as well as after compaction. • In high dust areas, workers should be provided and encouraged to use masks. • Regular maintenance, servicing of the vehicles and periodic emission check for equipment and machinery would be carried out in conformity with Schedule 6 – ‘Standards for Emission from Motor’ of The Environment Conservation Rules 1997 (Amended 2002); • Water to be sprayed on the haul road. • All the vehicles entering the project site will be checked for Pollution-Under-Control Certificates. • Air quality monitoring to be carried out during construction phase to check the pollutants level in the air
Procurement & Setting up of Crushers, Hot-mix plants, other Vehicles, Equipment and Machinery	• Specifications of crushers, hot mix plants and batching plants, other Construction Vehicles, Equipment and Machinery to be procured should comply to the DoE Standards/ norms • Adequate stack height and emission control devices such as bag house filters, cyclone separators, water scrubbers etc., should be attached • Impervious platform for storage of bituminous and other liquid hazardous chemical should be provided • Pollution control measures for Diesel Generator (DG) set i.e. stack height, acoustic enclosure etc. to be ensured • Provision of readily available first aid kit, firefighting equipments at the plant site at appropriate location to respond in case of accident. • Periodical monitoring of air quality and noise levels as per conditions stipulated under the statutory clearance from DoE. Whenever the emission exceeds the permissible level the plants should be stopped and necessary repairing works of faults should be done to bring down the emission levels
Contamination of soil	• Impervious platform and oil and grease trap for collection of spillage from construction equipment vehicle maintenance platform will be appropriately provided at construction camp, servicing area and liquid fuel and lubes at storage areas. • Proper management of waste from labour camps and construction site • Proper disposal of wastewater generated from labour camp and construction site

Impact	Mitigation Measures
Contamination of surface & ground water	• Car washing / workshops near water bodies will be avoided. • If possible, avoid excavation during monsoon season • Loosened soil will be stabilized by Contractor through landscaping and developing vegetation, wherever possible, once construction activity is completed at any site. • Sanitation facility with septic tank followed by soak pit to be developed. Toilets should be constructed on site during construction phase and the waste water would be channelized to the septic tanks and soak pits in order to prevent waste water to enter into the water bodies. • Provision of oil & grease traps upstream of storm water drains should be kept • Surface run off due to construction activity should not be discharged in open without treatment
Loss of water bodies/ surface ground /	• No excavation should be carried out from the bund of the water bodies. • No debris disposal near any water body. • Prior written permission from authorities is required for use of water for construction activity. • Construction labours to be restricted from polluting the source or misusing the source. • Labour camps should be located away from water bodies.
Drainage and runoff	• The Contractor would always clear all the cross drainage structures and natural drainage before onset of monsoon in order to keep all drainage unblocked Earth, stones, wastes and spoils will be properly disposed off, to avoid blockage of any drainage channel. • All necessary precautions should be taken to construct temporary or permanent devices to prevent inundation or ponding.
Noise from Vehicles, Plants and Equipment	• Construction activities carried out in the daytime only is preferred. • The construction equipment would be provided with adequate noise control measures and should comply with the noise standards as prescribed by DoE • Regular maintenance of vehicles and equipment would be carried out and corrective action taken in case of any deviation. • Ear muff/ear plug should be given to the workers working around or operating plant and machinery emitting high noise levels. • DG sets if installed should be provided with acoustic enclosures • Labour working in noise prone area should be provided with ear plugs and job rotation should be practiced to prevent the prolonged exposure of any workers to high noise levels
Loss or damage to vegetation Loss, damage or disruption to fauna	The site is devoid of any vegetation. Hence no impact pertaining to loss of vegetation cover and associated biodiversity is anticipated. However, plantation to be carried out in order to improve the quality of neighbouring environment. The plantation will act as habitat for various type of avifaunal, insects, smaller mammal, reptilian species. Construction workers will be directed not to disrupt or damage the flora and fauna.
Accidents	• Safety officer should be appointed at site to ensure all the safety guidelines are being followed at site • Cautionary guidance should be provided at site to aware people about the associated risk with the area. Entry to the fuel storage room or machinery operation room should be restricted only to authorized trainer personnel

Impact	Mitigation Measures
	All Accidents should be reported immediately and incident analysis, preventive measures shall be implemented.
Clearing of Construction of Camps & Restoration	- Contractors should prepare site restoration plans. The plans shall be implemented prior to demobilization. - On completion of works, all temporary structures shall be cleared, all rubbish burnt, excreta or other disposal pits or trenches filled in and sealed and the site left clean and tidy.
Occupational Health & Safety Plan	- All construction worker should wear PPEs including safety jacket, helmet, gloves, gum boots, ear plugs, mask while working at the site - Workers should be made aware about the health issues related with open defecation - Training to workers should be provided for handling the construction equipment and machinery - Training to the workers should be provided to handle the emergency situations like fire, floods etc. - First aid facility and sufficient nos. of trained personnel should be available at all the time at construction camp - Cautionary signage and notice should be displayed in local language and English at the required places like fuel storage area so that hazards can be avoided. A security guard should be deputed in these areas and entry should be restricted
Disaster Management	Precaution will be taken to prevent danger of the workers and the public from fire, flood, drowning, etc. All necessary steps will be taken for prompt first aid treatment of all injuries likely to be sustained during the course of work.

Table: Mitigation Measures Suggested for Individual Industries: Developmet of Industrial Units and Industrial Operation

Impact	Mitigation Measures During Construction Phase	Mitigation Measures During Operation Phase
Air Pollution	- Sprinkling of water during construction phase on all unpaved roads, site and haul roads - Avoiding excess pilling of raw material and debris at site - Storage & transportation of raw material and debris in covered conditions - Regular cleaning of site - Provision of adequate parking space at site so as to prevent idling of vehicles during construction phase - Up keeping and maintenance of all the construction vehicles, machinery and equipment used for construction purpose - Guiding signage should be provided at the site for vehicles entering the site to	- Installation of air pollution control devices like bag filters, separators, cyclones, multi-level condensers & evaporators, scrubbers, quenchers, stacks of height as per DoE norms - Disposal of the waste material at the designated site for waste disposal in covered condition - All the roads within the plot should be paved & water sprinkling should be practiced to minimize dust generation. - Adequate stack height should be provided for dispersion of the emissions - Chemicals having potential to release VOCs should be stored, handled and used in closed system

Impact	Mitigation Measures During Construction Phase	Mitigation Measures During Operation Phase
	minimize the movement of vehicle within the site • Timings of the construction material vehicles should be fixed and should be during non-peak hours to prevent traffic congestion and traffic jams • Construction vehicles should follow the speed limits as set up for EZ zone • Open burning of wood or any other material should be prohibited at site and all the workers should be made aware about the same	• Quarterly monitoring should be carried out for testing ambient air quality • Development of thick green belt of 10 m width all along the industrial plot periphery
Water Pollution & water Conservation	• Minimizing the run-off from the site by construction of temporary storm water drainage, sediment basins for collection of storm run-off and re-using that water for curing purpose and wheel washing • Curing of structures to be done by spraying and during early morning and evening hours only to minimize the water requirement • Maintaining the flow of water sprinklers so as to avoid wastage of water and ponding of water • No debris should be thrown or disposed off in any water body like river, pond, canal etc. or ground water source like functional or abandoned well • Excavation should not be carried out during monsoon • Excavated pits should be provided with garland drains to prevent entrance of water inside the pit • Provision of septic tanks and soak pits at the site for disposal of sewage generated by construction labour • Waste generated during construction should be disposed off regularly at the identified site for debris disposal	• Separation of the effluent streams depending on the nature of pollutants and connecting it to EZ's sewage/effluent network • Monitoring the quality of sewage, treated water, drinking water quality and ground water quality regularly • Tank alarms should be installed so as to prevent idle running of pumps • Provision of storm water drainage system at site and it should be connected to rain water harvesting system. Storm water drains should also be connected to storm water drainage of EZ • Provision of rain water harvesting system so that water can be collected and used to meet daily water demand. • Provision of oil & grease traps with the storm water drains draining the parking and fuel storage area • Untreated effluent should not be discharged in open • No hazardous waste, municipal waste, industrial waste should be disposed off in the water bodies or in ground • Leachates, if any or untreated sewage should be stored only in lined ponds to prevent contamination of ground water
Soil Quality	• Top soil, if excavated from the project site should be stored in covered condition and should be used later for landscaping purpose • Storage of raw materials, debris and fuel on paved surfaces	• All industries should use best technologies for optimal utilization of the raw material and re-use & recycling of waste material in the process to reduce

Impact	Mitigation Measures During Construction Phase	Mitigation Measures During Operation Phase
	• Training the workers to handle the material so as to minimize spillage of material on soil • Disposal of construction debris, municipal waste and hazardous waste at designated sites	waste generation as well as raw material demand for the project. • All industries should be responsible for management of the solid and hazardous waste generated from their plots. Industries should be liable to pay penalty in case of noncompliance of conditions laid down by DoE • It should be mandatory for all industries to provide storages for different category waste, its processing and safe disposal. Options for composting of compostable waste, segregation and selling recyclable waste should be opted • Waste storage area should be paved surfaces and covered • No open area should be left without the vegetation to protect the soil. • Hazardous Waste should be stored in designated area and should be disposed as per the best industrial practice.
Noise Pollution	• Construction vehicles, machinery and equipment used for construction purpose should meet the standards prescribed by DoE • Up keeping and regular maintenance of all the construction vehicles, machinery and equipment used for construction purpose • Speed limits should be restricted for all construction vehicles and equipment • Honking should be prohibited at the site • Provision of acoustic enclosures, noise mufflers, silencers etc. with the DG sets and any noise generating machinery • Provision of temporary noise shield/barrier in areas where more noise will be generated	• Usage of machineries of modern make and adoption of latest available technology which compiles to noise levels standards laid by DoE • Provision of personal protective equipment to workers exposed to noisy operations. Audiometric tests should be carried out for workers exposed to high noise levels. Job rotation should be practiced to prevent continual exposure. • Noise levels in industries should be monitored regularly using noise meters. • Minimal usage of horns within industrial plot. • Regular maintenance of vehicles & construction machinery involved in industrial operation • Noisy operation should be taken up in covered conditions so that no disturbance due to noise is caused

Impact	Mitigation Measures During Construction Phase	Mitigation Measures During Operation Phase
		Thick green belt should be developed within each industrial plot that will act as noise barrier.
Ecology	- Plantation should be carried out within individual industrial plots - Native plant species should be considered for plantation - Timber should be purchased only from authorized vendors	- Green belt of minimum 10 m thickness should be developed all along the periphery of the industrial plot - Native plant species requiring should be considered for plantation
Socio-economy and aesthetics	- All proposed air, water, noise and soil pollution control measures should be taken - Provision of employment opportunity during construction phase to local people - Provision of personal protective equipment to all the workers - Job rotation should be practiced for workers exposed to high noise levels - Site should be covered from all the site during construction phase - Drinking water facility, adequate nos. of toilet, septic tank/soak pit, bathing facility, lighting should be provided for construction labour - Storm water drainage system should also be provide at site to prevent water ponding and breeding of mosquitoes	- Social welfare activities shall be carried out by each industrial owners in nearby areas of EZ like development of cattle sheds, arranging trainings for villagers for best agriculture practices, providing skill generation training to locals so as they can be employed in industries - Providing employment to local people preferably - Adoption of adequate air, noise, soil and water quality measures
Disaster and Risk Management	- Provision of first aid kit and first aid room and well trained first aid practitioner at the site all the time - Ambulance facility should be provided at the site - Tie-ups with local hospital should be made to handling emergency case, if any - Availability of safety officers and supervisors at all the time on the site - Workers should be given training for handling construction vehicles, equipment and handling emergency situations like fire, floods, earthquake and cyclone - Cautionary signage should be provided in the areas associated with risks like storage of explosives, fuels, heavy construction material etc. Entry for only trained authorized personnel should be allowed in such areas with adequate safety measures	- Provision of first aid kits at the site - Tie-ups with local hospital should be made to handling emergency case, if any - Regular medical check-ups of the employees - Training should be given to workers for handling the equipment and managing emergency situations - Material safety data sheets of chemicals to be used should be displayed on local languages at work station - Provision of personal protective equipment to the workers as per requirement - Cautionary signage should be provided in the areas associated with risks like storage of chemicals, explosives, fuels etc. Entry for only trained authorized personnel should be allowed in

Impact	Mitigation Measures During Construction Phase	Mitigation Measures During Operation Phase
	- Emergency handling cell & room should be developed at the site and should be headed by project & safety manager - Contact no. of nearest fire-station and hospitals should be displayed within the emergency handling room	such areas with adequate safety measures

Environmental Management Plan (EMP)

The Environmental Management Plan (EMP) is the synthesis of all proposed mitigation and monitoring actions, set to a time frame with specific responsibility assigned and follow-up actions defined. EMP is a plan of actions for avoidance, mitigation and management of the negative impacts of the project. Environmental enhancement is also an important component of EMP. A detailed set of mitigation measures have been compiled in view of the likely impacts associated with the proposed development of DBL Industrial Park.

The EMP consists of a set of mitigation, monitoring and institutional measures to be taken during the design, construction and operation (post-construction) stages of the project. Besides EMP, Plan for Environmental Enhancement (covering Green belt development, Community Development etc.) and Emergency Preparedness Plan has also been furnished.

Monitoring Plan

The objective of environmental monitoring during the construction and operation phases is to compare the monitored data against the baseline condition collected during the study period to assess the effectiveness of the mitigation measures and for the protection of the surrounding environment. To monitor the extent of environmental impact of the proposed EZ and proposed industries, it is advisable to periodically monitor the ambient environmental quality around the project location. Monitoring plan describes need for the environmental quality monitoring detailing number and location of sampling stations, parameters to be monitored, frequency of sampling, etc. The EZ authorities have to submit all the monitoring results to DoE, Bangladesh.

Table: Environmental Monitoring Plan

S. No.	Aspect/Monitoring Indicators	Source/Nature of Impact	Monitoring Methods and Parameters	Frequency /Locations	Executing Agency	Enforcement Agency
1.0	Construction Phase					
1.1	Local Manpower Absorption	Construction Works	Contractor's report No. of people working in the project	Monthly	Contractor	DBL Industrial Park Limited
1.2	Soil Erosion	Excavation, disposal, cut & fill and land clearing activities for site levelling	Survey & observation; Extent and degree of erosion; Structures for	Monthly	Contractor	DBL Industrial Park Limited

S. No.	Aspect/Monitoring Indicators	Source/Nature of Impact	Monitoring Methods and Parameters	Frequency /Locations	Executing Agency	Enforcement Agency
		and internal roads, disposal	controlling soil erosion			
1.3	Greenbelt Development	-	Survival rate of species planted; Density of vegetation	Half-yearly	DBL Industrial Park Limited	DBL Industrial Park Limited
1.4	Air Quality	Transportation of construction materials, road construction, construction of utilities	as referred in 'Monitoring Indicator' section	Quarterly	Contractor	DBL Industrial Park Limited
1.5	Waste Management	Restoration of disposal sites and construction areas	Status of protection measures	Monthly	Contractor	DBL Industrial Park Limited
1.6	Noise Level	various construction/site preparation work	as referred in 'Monitoring Indicator' section	At high intensive area, as frequently as possible	Contractor	DBL Industrial Park Limited
1.7	Ground/Drinking Water	Accidental contamination	as referred in 'Monitoring Indicator' section	Monthly	Contractor	DBL Industrial Park Limited
1.8	Soil	Accidental contamination	as referred in 'Monitoring Indicator' section	Quarterly	Contractor	DBL Industrial Park Limited
2.0	Operation Phase					
2.1	Micro Meteorology	Various industrial operation	as referred in 'Monitoring Indicator' section	Monthly	DBL Industrial Park Limited	DBL Industrial Park Limited
2.2	Noise Levels	Noise levels compliance with respect to industrial standards	as referred in 'Monitoring Indicator' section	Monthly	Individual Industrial Units	DBL Industrial Park Limited
			as referred in 'Monitoring Indicator' section	Monthly	DBL Industrial Park Limited	DBL Industrial Park Limited
2.3	Ambient air quality	Ambient air quality levels compliance with respect to industrial standards	as referred in 'Monitoring Indicator' section	Quarterly	DBL Industrial Park Limited	DBL Industrial Park Limited
			as referred in 'Monitoring Indicator' section	Quarterly	DBL Industrial Park Limited	DBL Industrial Park Limited
2.4	Drinking water quality	Contamination due to EZ operation	All physio-chemical & biological parameters	Monthly	DBL Industrial Park Limited	DBL Industrial Park Limited

1. Introduction

1.1. Project Background

The Government of Bangladesh has envisaged organized industrialization for the country, which can help its competitiveness by encouraging investment from global manufacturers across sectors. With this in mind, the EZ model has been adopted and pushed to encourage industrialization in an organized manner, which can help the country gain a stronger foothold in manufacturing and diversify its export basket, which has been relying on readymade garments sector (RMG).

GoB has adopted a proactive approach to promulgate investment within the country and foster organized industrialization. In tandem with this initiative, economic zone (EZ) regime ushered in, and Bangladesh Economic Zones Authority (BEZA) was conceptualized. BEZA is the nodal agency mandated for economic zone development in the country. BEZA in support with World Bank is implementing Private Sector Development Support Project (PSDSP) to upkeep pilot EZ projects under the new EZ regime.

DBL Industrial Park Limited is a Private Limited Company, playing role as a “Developer” in the project. The project is envisioned to develop a portion of the Shreehatta Economic Zone complying infrastructural and community facilities aligning the prime objective of Bangladesh Economic Zone Authority (BEZA) to attract investors for large manufacturing and service industry.

The project site of DBL Industrial Park is located at Sherpur and Bamongaon Mouza, Maulvibazar Sadar upazila, Moulvi Bazar District, Sylhet Division.

The zone will have access to utilities such as power, water and gas which are critical enablers for development of economic zone. There is adequate supply of unskilled labor from the rural areas in the vicinity, however skilled and semi-skilled labor needs to be procured from the nearby urban agglomerations since there is a dearth of quality educational infrastructure in the region.

1.2. About the Project

DBL Industrial Park Limited, playing role as a “Developer” in this project. The project is envisioned to develop a portion of the Shreehatta Economic Zone complying infrastructural and community facilities aligning the prime objective of Bangladesh Economic Zone Authority (BEZA) to attract investors for large manufacturing and service industry.

The aim of setting up an EZ is to develop various industries in the region along with excellent state-of-the-art infrastructure facilities and professional management to attract and support investments in industrial sectors. The type of industries to be accommodated within EZ are as follows- Spinning Mills, Garments Accessories, Glass Factory, Glass Processing Factory, Ceramic Tiles Factory, Ceramic Frit, Aluminium Ball, Sanitary Ware and Abrasive Tool Factory.

1.2.1. Location of Project Site

The project site of DBL Industrial Park is located at Sherpur and Bamongaon Mouza in Maulvibazar Sadar upazila of Moulvi Bazar District in Sylhet Division of Bangladesh.

The proposed EZ site is well connected with Dhaka – Sylhet national highway. Both Sylhet Dhaka highway and Sylhet Maulvibazar roads will be access road for the site. There are two railway stations near the EZ site – Sylhet Station (35 Km from the site) and Sreemangal Station (43 Km from site). Osmani International Airport in Sylhet is about 55 Km from the site.

The area of the EZ is 167.6 acres and is a part of Shreehatta EZ (total Area 353.53acres). The location of proposed EZ is furnished in below figure.

Figure 1: Location of Proposed EZ Site



Source: PMO Library, Dhaka & PwC Analysis

Table 1: Snapshot of EZ Site Surrounding

Parameters	Details
Site co-ordinates	Latitude: 24°37'29.37"N

Parameters		Details
		Longitude: 91°39'58.22"E
Site Surrounding Features	East	BEZA site
	West	Open Land
	North	Open Land
	South	Dhaka-Sylhet Highway
Total area of the EZ		167.6 Acores
Ownership of Land		DBL Industrial Park (Through lease from BEZA)

Source: PwC analysis

Figure 2: View of Proposed EZ Site



1.2.2. Connectivity to Proposed Site

Proposed EZ area is connected with all the major locations of Bangladesh by road. The EZ site abuts the Dhaka – Sylhet national highway. It is located on northern side of the 2 lane highway. Currently this highway is catering to passenger buses and trucks destined for Northern Bangladesh. A small bridge at intersection of River Kushiara and Dhaka-Sylhet highway called Sherpur bridge bifurcates the two sides of the site. Sylhet Maulvibazar road from the Sherpur bridge runs perpendicular to site. Both Sylhet Dhaka highway and Sylhet Maulvibazar roads will be access road for the site.

1.3. Rationale for the Proposed Project

Bangladesh's economic landscape is evolving. Its' performance on several macro-economic factors is improving. This is a reflection of the country's economic health, perception of investors, and the advantages of the country from an economic perspective.

- Bangladesh is gradually shaping as the next prominent investment destination in South Asia. The country has evolved into an attractive destination for manufacturing industry in recent years due to various reasons such as availability of cheap and trainable labour, low cost of land, various favourable trade treaties of Bangladesh with major economies such as US and EU, liberal FDI regime, and government's efforts to develop the industrial sector.
- Bangladesh has been exhibiting a growth trend of GDP, Exports and FDI. The country has easy availability of skilled or trainable cheap labour. Thus, the manufacturing sector holds huge growth potential in Bangladesh. The manufacturing sector is expected to play a key role in the development of the country and to lead the country from the status of developing nation to a developed nation in the coming future, in line with the country's goal for 2041.

- Government of Bangladesh is focused on increasing industrial proliferation within the country and it is undertaking various measures such as policy reforms and infrastructure development projects to support the increase in share of manufacturing from 28% at present to 37% by 2021 as per the Vision 2021 perspective plan of the country.
- Bangladesh has embarked into an ambitious journey of promoting the manufacturing sector in the country through several initiatives promoting organized industrialization to achieve inclusive growth.
- Organized industrialization in Bangladesh is majorly concentrated on the development of industrial clusters dedicated to exports (Export Processing Zones) and dedicated to overall industrial development (Economic Zones).
- The PPP model of development of an economic zone is gaining popularity in Bangladesh. Here, the private sector plays the role of developer and operator of the EZ, while the role of Govt. is limited to providing land and utilities on lease to the developer and providing regulatory support. Owing to their operational efficiency, financial soundness, and ability to market, private players can be successful in proliferation of PPP economic zones in Bangladesh.
- Development of Economic Zones in the country is expected to play a key role in improving the business environment of Bangladesh. Economic Zones facilitates organized industrialization, with provisions for development of backward linkages, and an industrial ecosystem with all the required utilities and amenities.

1.4. Scope and Methodology of the Study

The scope and proposed methodology for carrying out the ESIA of the proposed site are:

- Identification and review of applicable local, state, national and international environmental and social regulatory and institutional frameworks;
- Establishment of environmental baseline conditions of the site and surrounding area through the following:
 - Detailed surveys to observe environmental characteristics of the project area;
 - Discussions with the stakeholders and identification key issues during planning, construction and operation phase of the project;
 - Baseline data collection of the site and project area with respect to water and soil quality, ambient air and noise quality, environmental hazards and
 - Ecological assessment on flora and fauna of the site and project area through secondary data collection.
- Assessment of the socio-economic environment through collation of secondary information of the site, supplemented by consultations with the local communities to understand community perception with regard to the project and its activities;
- Preparation of the ESIA report which includes:
 - Project Description describing the proposed project and its geographic, ecological, social, health and temporal context, including any related facilities that may be required;
 - Applicable Environmental Regulatory Framework including host country regulations, obligations for implementing relevant international social and environmental treaties, agreements, and conventions and policies;
 - Environmental Baseline Conditions on the basis of the above identified parameters to understand the profile of the area and describe relevant physical, biological, health and labour conditions in the project area of influence;

- Impact Assessment and proposal for mitigation measures for environmental and social components for pre-construction/construction and operation phases to minimize the adverse impacts; and
- Preparation of Environmental Management Plan (EMP) and Management System which includes the following:
 - Mitigations for adverse environmental impacts and associated risks;
 - Institutional arrangement - management tools and techniques for the implementation of environmental impacts and risk mitigations;
 - Monitoring and reporting of requirements and mechanisms for the effective implementation of the suggested mitigations; and
 - Preparation of EMP.

1.5. Limitation of the Assessment

The present ESIA Report has been prepared based on the Primary field investigations / assessment, and secondary data collected from various concerned stakeholders and published journals - reports, public consultation and site observations. The environmental assessment is based on the information collected from the DBL Industrial Park Limited, various Agencies, community consultations and observations. Professional judgement and subjective interpretation of facts and observations has been applied for the preparation of the ESIA Report.

1.6. ESIA Team

A multidisciplinary team of professionals having experience of conducting Environment & Social Impact Assessment Studies for infrastructure development projects like Industrial Parks, Industrial Areas, Economic Zones, Area development etc. was involved in carrying out ESIA study for this project. Details of the experts engaged in the assignment are given in the table below.

Table 2: ESIA Team

S.No.	Name of the Expert	Proposed Position	Qualification	Experience
1	Dr. Deepak Malik	Team Leader	Ph.D. Engineering (Health Safety and Environment); Master of Science (Ecology & Environment)	26 Years
2	Satyajit Ray	Environmental Expert	M.Sc. in Environmental Science, University of Calcutta B.Sc. University of Calcutta	12 years
3	Mohammad Abul Hashem	Social Development Expert	Master of Social Science (Sociology & Anthropology), Santo-Marium University & Creative Technology, Bachelor's degree (Humanity), National University	22 Years
4	Ahmed Faruque	ESIA Support Staff	B. Sc. in Economics from North South University	3.5 Years

1.7. ToR Compliance Matrix

The ESIA study has been conducted as per TOR issued by DOE in accordance with the national environmental regulations. ToR Point wise compliance is provided in below matrix.

Table 3: Compliance of ToR Points

S. No.	ToR Points	Compliance
I	The project authority shall conduct a comprehensive Environmental Impact Assessment (EIA) study considering the overall activity of the said project in accordance with this ToR and following additional suggestions	EIA study has been carried out in line with the ToR Approved by DoE
II	The EIA Report should be prepared in accordance with following indicative outlines:	EIA Report has been prepared in accordance to the outline given in ToR
-	Executive Summary	Refer Executive Summary
1	Introduction: (background, brief description, rationale of the project, scope of study, methodology, limitation, EIA team, references)	Refer Chapter 1
2	Legislative, regulation and policy consideration (covering the potential legal, administrative, planning and policy framework within which the EIA will be prepared)	Refer Chapter 2
3	Project Description	Refer Chapter 3
i	Introduction	Section 3.1.
ii	Project objective	Section 3.2.
iii	Project options	Section 3.3.
iv	Interventions under selected options	Section 3.4.
v	Project activities: A list of the main project activities to be undertaken during site clearing, construction as well as operation	Section 3.5
vi	Project Schedule: Phase and timing for development of Project	Section 3.7.
vii	Resources and utilities demand: Resources required to develop the project, such as soil and construction material and demand for utilities (water, electricity, sewerage, waste disposal and others), as well as infrastructure (road, drains, and others) to support the project	Section 3.6. and 3.5
viii	Map and survey information Location map, cadastral map showing land plots (project and adjacent area), geological map showing geological units, fault zone, and other natural features	Section 3.8.
ix	Project Plan, Design Standard, Specification, Quantification etc.	Section 3.9
4.	Environmental and Social Baseline	Refer Chapter 4
4.1.	Meteorology	Section 4.3.2.
4.1.1.	Temperature	Section 4.3.2.1.
4.1.2.	Humidity	Section 4.3.2.2.
4.1.3.	Rainfall	Section 4.3.2.3.
4.1.4.	Evaporation	Section 4.3.2.4.
4.1.5.	Wind Speed	Section 4.3.2.5.
4.1.6.	Sunshine hours	Section 4.3.2.6.
4.2.	Air Quality & Noise	Section 4.3.3.
4.2.1	Ambient Air Quality of the project site with respect to Standards of ECR,1997	Section 4.3.3.1.
4.2.2	Ambient Noise Level of the project site with respect to Standards of Noise Pollution (Control) Rules, 2006	Section 4.3.3.2.
4.2.3.	Air Pollutant and noise sources from existing and known source	Section 4.3.3.3

S. No.	ToR Points	Compliance
4.3.	Water Resources	Section 4.3.4.
4.3.1.	Surface Water System	Section 4.3.4.1.
4.3.2.	Tropical cyclones and Tidal Flooding	Section 4.3.4.2. and 4.3.4.3.
4.3.3.	Salinity	Section 4.3.4.4.
4.3.4.	Drainage Congestion and Water Logging	Section 4.3.4.5.
4.3.5.	Erosion and Sedimentation	Section 4.3.4.6.
4.3.6.	River Morphology	Section 4.3.4.7.
4.3.7.	Navigation	Section 4.3.4.8.
4.3.8.	Ground Water System	Section 4.3.4.10.
4.4.	Land Resources	Section 4.3.5.
4.4.1.	Agroecological Regions	Section 4.3.5.1.
4.4.2.	Land Types	Section 4.3.5.2.
4.4.3.	Soil Texture	Section 4.3.5.3.
4.4.4.	Land Use	Section 4.3.5.5.
4.5.	Agriculture Resources	Section 4.3.6.
4.5.1.	Farming Practice	Section 4.3.6.1.
4.5.2.	Cropping Pattern and Intensity	Section 4.3.6.2.
4.5.3.	Cropped Area	Section 4.3.6.3.
4.5.4.	Crop Production	Section 4.3.6.3.
4.5.5.	Crop Damage	Section 4.3.6.4.
4.5.6.	Main Constraints of Crop Production	Section 4.3.6.4.
4.6.	Livestock and Poultry	Section 4.3.7.
4.6.1.	Feed and Fodder Shortage	Section 4.3.7.1.
4.6.2.	Livestock/Poultry Diseases	Section 4.3.7.2.
4.7.	Fisheries	Section 4.3.8.
4.7.1.	Introduction	Section 4.3.8.1.
4.7.2.	Problem and Issues	Section 4.3.8.5.
4.7.3.	Habitat Description	Section 4.3.8.2.
4.7.4.	Fish Production and Effort	Section 4.3.8.3.
4.7.5.	Fish Migration	Section 4.3.8.4.
4.7.6.	Fish Biodiversity	Section 4.3.8.4.
4.7.7.	Fisheries Management	Section 4.3.8.5.
4.8.	Ecological Resources	Section 4.3.9.
4.8.1.	Bio-ecological Zone/Protected Areas	Section 4.3.9.1.
4.8.2.	Common Flora and Fauna	Section 4.3.9.4.
4.8.3.	Ecosystem Services and Function	Section 4.3.8.5.
4.9.	Socio Economic Condition	Section 4.3.10.
4.9.1.	Socio Economic Condition	Section 4.3.10.1.
4.9.2.	Quality of Life Indicators	Section 4.3.10.2.
4.9.3.	Income and Poverty	Section 4.3.10.3.
4.9.4.	Gender and Women	Section 4.3.10.4.
4.9.5.	Common Property Resources	Section 4.3.10.5.
4.9.6.	Conflict of Interest and Law and Order Situation	Section 4.3.10.6.
4.9.7.	Historical, Cultural and Archaeological Sites	Section Section 4.3.10.7
5	Identification and Analysis of Key Environmental Issues (Analysis shall be presented with Scenarios, Maps, Graphics, etc. for the Case of Anticipated Impacts on Baseline)	Refer Chapter 5
5.1	Environmental Sensitivity Investigation	Section 5.1.
5.2	Environmental Asset	Section 5.2.
5.3	Environmental Hot Spots	Section 5.3.
5.4	Likely Beneficial Impacts	Section 5.4.
5.5	Community Recommendations	Section 5.5.
5.6	Alternate Analysis	Section 5.6.

S. No.	ToR Points	Compliance
6.	Environmental and Social Impacts	Refer Chapter 6
6.1.	Introduction	Section 6.1.
6.2.	Impact on Air Quality and Noise	Section 6.4. and 6.5
6.2.1.	Pre-construction Phase	Section 6.4. and 6.5
6.2.2.	Construction Phase	Section 6.4. and 6.5
6.2.3.	Post-construction Phase	Section 6.4. and 6.5
6.3.	Impact on Water Resources	Section 6.6.
6.3.1.	Pre-construction Phase	Section 6.6.
6.3.2.	Construction Phase	Section 6.6.
6.3.3.	Post-construction Phase	Section 6.6.
6.4.	Impact on Land Resources	Section 6.7.
6.4.1.	Pre-construction Phase	Section 6.7.
6.4.2.	Construction Phase	Section 6.7.
6.4.3.	Post-construction Phase/Operation	Section 6.7.
6.5.	Impact on Agriculture Resources	Section 6.8.
6.5.1.	Pre-construction Phase	Section 6.8.
6.5.2.	Construction Phase	Section 6.8.
6.5.3.	Post-construction Phase	Section 6.8.
6.6.	Impact on Fisheries	Section 6.9.
6.6.1.	Pre-construction Phase	Section 6.9.
6.6.2.	Construction Phase	Section 6.9.
6.6.3.	Post-construction Phase	Section 6.9.
6.7.	Impact on Ecosystem	Section 6.10.
6.7.1.	Pre-construction Phase	Section 6.10.
6.7.2.	Construction Phase	Section 6.10.
6.7.3.	Post-construction Phase	Section 6.10.
6.8.	Socio Economic Impact	Section 6.11.
6.8.1.	Pre-construction Phase	Section 6.11.
6.8.2.	Construction Phase	Section 6.11.
6.8.3.	Post-construction Phase	Section 6.11.
7.	Public Consultation and Disclosure	Refer Chapter 7
7.1.	Introduction	Section 7.1.
7.2.	Objectives of Public Consultation and Disclosure Meeting	Section 7.2.
7.3.	Approach and Methodology of Public Consultation and Disclosure Meeting	Section 7.3.
7.4.	Public Consultation Meetings (PCMs)	Section 7.4.1. and 7.4.2.
7.5.	Public Disclosure Meetings (PDMs)	Section 7.4.1. and 7.4.2.
8.	Environmental Management Plan and Monitoring Indicators	Refer Chapter 8
8.1.	Introduction	Refer Section 8.1.
8.2.	Mitigation Plan	Refer Section 8.2.
8.3.	Enhancement Plan	Refer Section 8.3.
8.4.	Contingency Plan	Refer Section 8.4.
8.5.	Compensation Plan	Refer Section 8.8.
8.6.	Monitoring Plan	Refer Section 8.7.
8.7.	Monitoring Indicators	Refer Section 8.6.
9.	Cost Estimation for Environmental Mitigation Measures and Monitoring	Refer Chapter 9
10.	Emergency Response Plan and Disaster Impact Assessment	Refer Chapter 10
11.	Conclusions and Recommendations	Refer Chapter 12
III	Without obtaining approval of EIA report by the Department of Environment, the Project authority	Agreed

S. No.	ToR Points	Compliance
	shall not be allowed to conduct earth filling or any kind of physical intervention in the proposed project site and also not be able to start the physical activity of the project.	
IV	This approval of the Terms of Reference (ToR) would not mean any acceptance or site clearance of the Project.	Agreed
V	The proposed EIA study would not establish any claim, right in favour of the proponent for getting site clearance or environmental clearance.	Agreed
VI.	Without obtaining Environmental Clearance, the project authority shall not be able to start the operation of the project.	Agreed
VII.	The project authority shall submit the EIA along with - - the filled in application for Environmental Clearance in prescribed form, - the feasibility study report, - the applicable environmental clearance fee in a treasury chalan, - the applicable VAT on clearance fee in a separate treasury chalan, - the No Objection Certificate (NOC) from the local authority, - NOC in favour of cutting /dressing (if it is required) of Hill/Hillock from concerned authority and NOC from other relevant agencies for operational activity etc. to the Chattogram District Office of DOE with a copy to the Head Office of DOE in Dhaka.	Submitted seperately

1.8. Structure of the Report

This ESIA report has been prepared strictly following the report structure desired by DOE as per TOR. The ESIA report contains project features, baseline environmental conditions, assessment of environmental impacts and formulation of mitigation measures along with environmental management and monitoring plan.

The report includes the following chapters:

Executive Summary

The executive summary gives the synopsis of the ESIA Report.

Chapter 1: Introduction

This chapter provides background information of the project proponent, rationale of the project, scope and methodology, Location and brief background of the project, Experts involved in the assignment and structure of the report.

Chapter 2: Legislative, regulation and policy consideration

This chapter deals with the details of the potential legal, administrative, planning and policy framework which have been used in the preparation of the ESIA Report.

Chapter 3: Project Description

This chapter deals with the details of the proposed project such as project objective, proposed interventions and activities, project requirements, Infrastructure development, environmental consideration, project cost, implementation schedule, etc.

Chapter 4: Analysis of Alternatives

This Chapter provides the details of alternative options explored for this Industrial Park

Chapter 5: Environmental and Social Baseline

This Chapter describes the baseline environmental conditions around the project site for various environmental attributes, viz. physical, biological and socio-economic, within the 10 km radial zone, which is termed as the Proposed Site. Topography, soil, water, meteorology, air, noise, and land constitute the physical environment, whereas flora and fauna constitute the biological environment. Demographic details and occupational pattern in the Proposed Site constitute socio-economic environment. Baseline environmental conditions are based on the information collected from the various agencies and the secondary data collected from published sources.

Chapter 6: Identification and Analysis of Key Environmental Issues

This chapter details the analysis of the key environmental issues.

Chapter 7: Environmental and Social Impacts

This chapter details the inferences drawn from the environmental impact assessment of the proposed project. It describes the overall impacts of the project activities and underscores the areas of concern, which need mitigation measures.

Chapter 8: Public Consultation and Disclosure

This Chapter provides an insight into the process & methodology followed for carrying out the public consultation meetings (with institutional stakeholders and community) in Proposed Site and outcome of public consultations

Chapter 9: Environmental Management Plan and Monitoring Indicators

This Chapter provides mitigation and control measures to attenuate and/or eliminate environmental impacts, which are likely to be caused by the proposed project. An Environmental Management Plan (EMP) has been developed to mitigate the potential adverse impacts and to strengthen the beneficial impacts. This chapter also provides the environmental monitoring plan proposed for the project.

Chapter 10: Cost Estimation for Environmental Mitigation Measures and Monitoring

This chapter concludes on the findings that emerged from the environmental assessment study and summarizes the key points to be addressed to ensure the environmental sustainability of the project during the preconstruction, construction and operation phases.

Chapter 11: Emergency Response Plan and Disaster Impact Assessment

The chapter envisages potential onsite and offsite emergency situation and suggest mitigation measures to combat such situation.

Chapter 12: Traffic Safety Plan

This chapter gives an outline of Traffic Safety Measures to be followed at workplace

Chapter 13: Conclusions and Recommendations

This chapter concludes on the findings that emerged from the environmental assessment study and summarizes the key points to be addressed to ensure the environmental sustainability of the project during the preconstruction, construction and operation phases.

1.9. Acknowledgement

Table 4: Acknowledgement

Government Departments	
1.	Bangladesh Economic Zones Authority (BEZA)
2.	Bangladesh Bureau of Statistics
3.	Bangladesh Department of Agriculture
4.	Bangladesh Economic Zone Authority
5.	Bangladesh Forest Department
6.	Bangladesh Meteorological Department
7.	Bangladesh Water Development Board
8.	Bangladesh Department of Environment
9.	Department of Fisheries
10.	Department of Forest
11.	Department of Disaster Management
12.	Department of Livestock
13.	Geological survey of Bangladesh
14.	Land & Revenue Department
15.	Soil Resource Development Institute (SRDI)
Other Entities	
1.	DBL Industrial Park Limited
2.	IDCOL

2. Legislative, Regulation and Policy Consideration

2.1. Regulatory Requirements for the Proposed Project

The Government of Bangladesh has framed various laws and regulation for protection and conservation of natural environment. These legislations with applicability to this project are summarized below.

Table 5: Applicability of Key Environmental Legislation at a Glance

Name	Key Requirement	Applicability	Remarks
Acts/Rules			
The Environment Conservation Act, 1995 and subsequent amendments in 2000 and 2002 and 2010 Environment Conservation Rules, 1997 (Subsequent Amendments in 2002 and 2003)	- Mandatory requirement of prior environment clearance for certain category of project for conservation and improvement of environment and control and mitigation of pollution of the environment. - To ascertain responsibility for compensation in case of damage to ecosystem - Restriction on polluting automobiles, sale and production of environmental harmful items. - Promulgation of standards for quality of air, water, noise and soil for different areas for different purposes. - Declaration of ecologically critical areas - Promulgation of standard limit for discharging and emitting waste. - Formulation and declaration of environmental guidelines. - Categorization of industries, development projects and other activities on the basis of pollution activities of the existing or proposed industries/ development projects/ activities.	Applicable. The project is classified under red category EIA study required to be undertaken	Site approval certificate is to be obtained from DoE
Environment Court Act, 2000 and subsequent	To give high priority to environment pollution prevention	Applicable as the project shall have environmental impacts	All the developments to be carried out as per ECA, 1995 & ECR, 1997 and amendments.

Name	Key Requirement	Applicability	Remarks
amendments in 2002			
The Private Forests Ordinance Act, 1959	Conservation of private forests and for the afforestation on wastelands.	Applicable as the tree cutting is involved in development of off-site facilities	Tree cutting to be carried out after taking permission from Forest Department
The Protection and Conservation of Fish Act, 1950 and subsequent amendments in 1982	Prohibit or regulate the construction, temporary or permanent of weirs, dams, bunds, embankment and other structures	Applicable if The project involves construction of dams along river stretches.	Necessary permission would need to be taken for construction of such structures
Water Pollution Control Ordinance 1970	Prevention of water pollution	Applicable from the prospective of prevention of pollution	Applicable during both construction stage (e.g. sewage and equipment washing and maintenance liquid waste discharges at construction camps) and operation phase
The ground Water Management Ordinance 1985	• Management of Ground Water Resources. • Tube well shall not be dug in any place without permission from Upzilla parishad.	Will be applicable if usage of ground water is proposed.	DPHE
The Embankment and Drainage Act 1952	An Act to consolidate the laws relating to embankment and drainage and to make better provision for the construction, maintenance, management, removal and control of embankments and water courses for the better drainage of lands and for their protection from floods, erosion and other damage by water.	Applicable. The project proposes construction of embankment and alteration of water course	Regulatory authority Ministry of Water Resources and FCD
The Building Construction Act 1952 (with latest amendment 2006)	An Act to provide for the prevention of haphazard construction of building and excavation of tanks which are likely to interfere with the planning of certain areas in Bangladesh	Applicable as the project involves development of infrastructure	Regulatory authority is Ministry of Works
The Vehicle Act, 1927 The Bengal Motor Vehicle Rules, 1940	To regulate vehicular exhaust emissions, fitness of vehicles, appropriate permits and licenses	Applicable as heavy vehicle movement is involved both during construction	Regular maintenance and up keeping of the vehicles should be carried out. Regulatory authority is

Name	Key Requirement	Applicability	Remarks
Road Transport Act, 2018		and operation phase	Bangladesh Road Transport Authority
Bangladesh Labor Law 2006, amendment 2013 Bangladesh Labor Rules 2015	This Act pertains to the occupational rights and safety of factory workers and the provision of a comfortable work environment and reasonable working conditions.	Applicable as the workers will be employed during construction and operation phase	Regulatory authority is Ministry of labor
Water Supply and Distribution Act, 1996	According to this law, any unauthorized connection of water network can be cut off by the concerned authority without any prior notice. If customer is unable to pay fees in due time, the authority may give one-month notice period and failing to comply within this period, the authority may disconnect the water supply network. If the consumer uses water for purposes other than the purpose he was supposed to use for during the approval of water supply connection, the authority may disconnect the network without any prior notice.	This act is applicable for establishing water supply network in the EZ area	
Natural Gas Safety Rules 1991 (amended in 2003)	Provides guidelines on the materials, design and construction of gas transmission and pipeline industry. This Safety Rules were based on the American National Standard Codes for Gas Transmission and Piping System	Not applicable	
Industry Policy, 2016	The important and underlying objectives of the Industrial Policy 2016 include sustainable and inclusive industrial growth through generation of productive employment to create new entrepreneurs, mainstreaming women in the industrialisation process and international market linkage creation.		

Name	Key Requirement	Applicability	Remarks
Wetland Protection Act 2000	The Playfield, Open Space, Park and Natural Water Reservoir Conservation Act, 2000 is applicable for Mega city, Divisional Town and District Town's municipal areas including country's all the municipal areas' playground, open space, park and natural water reservoir Conservation. This act is created for conservation, regulation, protection and to reduce the abuse of resources as well as to make them sustainable for future. According to this law, playfield, open space, park and natural water bodies which are marked cannot be used another way, it cannot be rented, leased or cannot be handover any other use. if it is needed to change the class of the land or it's any portion, the owner should apply through the correlated authority by writing the cause to the government.	This law implies importance of reservation of open spaces and water bodies during construction planning and operation	
The Brick Burning (Control) Act, 1989, The Brick Burning (Control) Amendment Act, 1992 and 2001	This law is enforced by Ministry of Environment & Forest (MoEF). According to this law, control of brick burning requires a license from the MoEF and brick burning with fuel wood is restricted.	Applicable during construction phase	
The Antiquities Act 1968	According to this Act, if the Director receives any information or otherwise has the knowledge of the discovery or existence of an antiquity of which there is no owner, he shall, after satisfying himself as to the correctness of the information or knowledge, take such steps as he may consider necessary for the custody, preservation and protection of the antiquity. If the Government has reasonable grounds to believe that any land contains any antiquity, it may [acquire such land or any part thereof] under country's current	Applicable if such antiquities are discovered in the project site during the construction phase or the operations phase.	No such antiquities were found by the ESIA team during inspection.

Name	Key Requirement	Applicability	Remarks
	land acquisition act, as for a public purpose.		
Right to Information Act, 2009	The Act makes provisions for ensuring free flow of information and people's right to information. The freedom of thought, conscience and speech is recognised in the Constitution as a fundamental right and the right to information is an alienable part of it. Since all powers of the Republic belong to the people, it is necessary to ensure right to information for their empowerment. The right to information shall ensure that transparency and accountability in all public, autonomous and statutory organisations and in private organisations run on government or foreign funding shall increase, corruption shall decrease and good governance shall be established. It is expedient and necessary to make provisions for ensuring transparency and accountability.	Applicable for the stakeholder consultation phase	
Policies & Plans			
National Environment Policy, 1992	For sustainable development	Applicable for all development projects	Usage of energy efficient building material, fuel etc. should be encouraged
National Environment Management Action Plan 1995	Conservation of natural habitats, bio-diversity, energy, sustainable development and improvement of life of people	Applicable for all development projects	Usage of energy efficient material, green building techniques, reduction of carbon foot prints etc.
National Conservation Strategy	Sustainable development of Industrial Sector	Applicable for all development projects	Usage of energy efficient material, green building techniques, reduction of carbon footprints etc.
The National Energy Policy, 1995	Protecting the environment by requiring an EIA for any new energy development project, introduction of economically viable and environment friendly technology.	Applicable. EIA study is to be carried out	Energy efficient materials and techniques should be explored

Name	Key Requirement	Applicability	Remarks
The National Water Policy, 2000	To ensure efficient and equitable management of water resources, proper harnessing and development of surface and ground water, availability of water to all concerned and institutional capacity building for water resource management	Applicable. Ground and surface water is required to be withdrawn for fulfilling water requirement	Conjunctive use of water should be explored
The National Water Management Plan, 2001	Addresses options for water quality, considerations behind measures to clean up industrial pollution, where effluent discharge monitoring and zoning regulations for new industries are emphasized	Applicable as the proposed development will involve generation of sewage	Installation of sewage treatment facility within the premises
Bangladesh Climate Change Strategy and Action Plan 2009	The Bangladesh Climate Change Strategy and Action Plan (BCCSAP) is a knowledge strategy built upon the National Adaptation Programme of Action (2005). It sets out 44 programmes to be taken by Bangladesh over the short, medium and long term within six strategic areas – food security, social protection and health; comprehensive disaster management; infrastructure; research and knowledge management; mitigation and low carbon development; and capacity building and institutional strengthening.	Applicable for the well-being of the adjacent livelihood and infrastructures	
National Land Use Policy 2001	The National Land Use Policy was enacted in 2001, aims at managing land use effectively to support trends in accelerated urbanization, industrialization and diversification of development activities. The policy urges that increasing the land area of the country may be not possible through artificial land reclamation process, which is cost-effective only in the long run.	Applicable for industrialization in the area	
Bangladesh Standards and Guidelines for Sludge Management	The guideline provides extensive information on all aspects of sludge management. It is addressed to anyone operating water or wastewater treatment plants or central effluent treatment plants producing sludge, regardless of the origin of the wastewater involved in the classification, management and use or disposal of sludge. These guidelines describe various	Applicable for both residential and industrial area	According to this guideline, the sludge generated from ETP at DIPL is hazardous in nature. It also suggests necessary solutions for safe management and disposal for hazardous waste.

Name	Key Requirement	Applicability	Remarks
	methods of sludge treatment and disposal.		
Private Sector Development Support Project			
Environment & Social Management Framework (ESMF)	Describes all the mandatory environmental and social clearances and purpose of the same required to be taken before development of the project	Triggered	The framework sets out mitigation, monitoring and institutional measures to be taken during design, implementation and operation of the project activities to eliminate adverse environmental impacts, offset them, or reduce them to acceptable levels.
Bangladesh Bank ESRM 2017			
Bangladesh Bank ESRM 2017	The ESRM Guideline includes one Generic ESDD checklist and 10 sector specific checklists for high risk sectors.	Triggered	The FI (IDCOL) is to conduct E&S risk assessment through the ESDD checklist at different stages of the project throughout the project cycle. The E&S risk rating of the project should be submitted to BB on a regular basis.

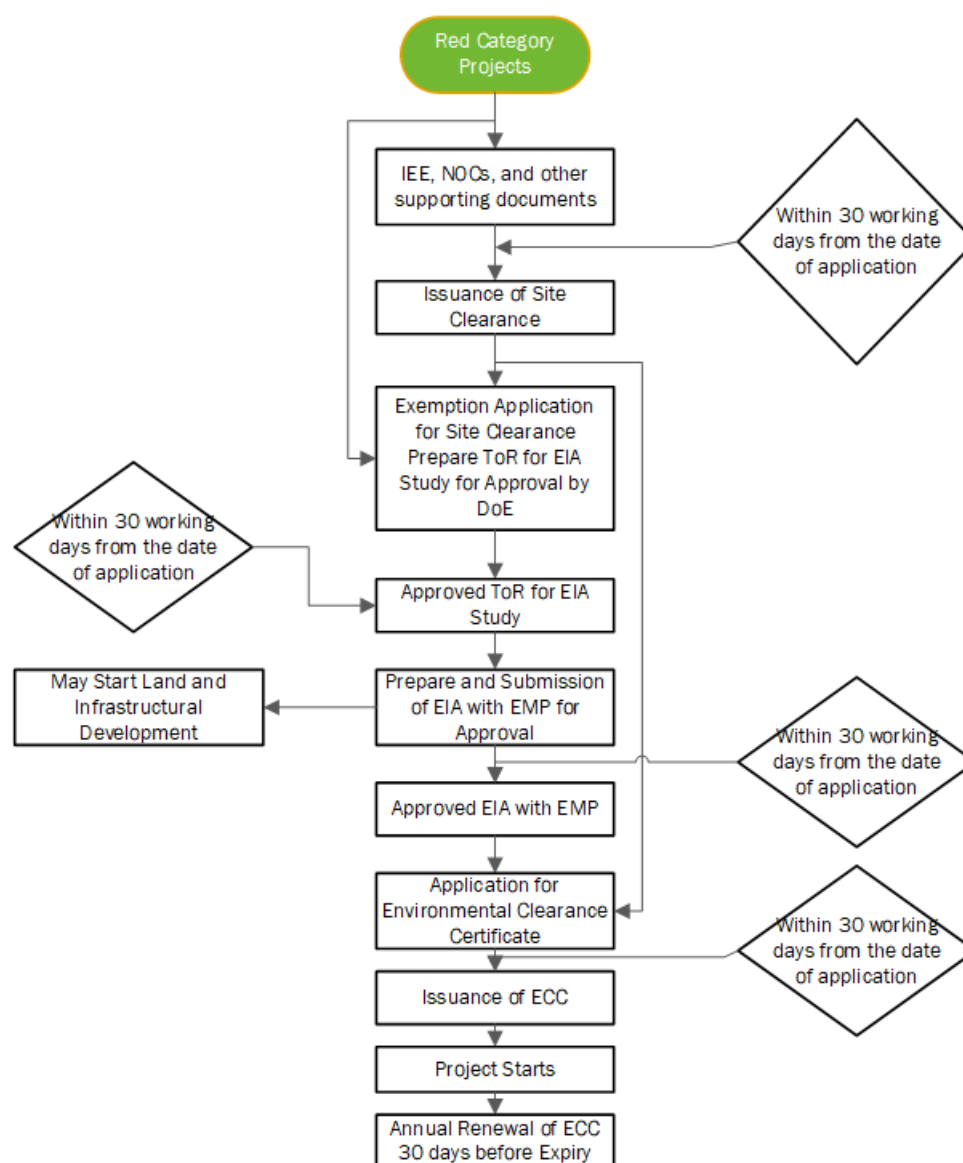
2.2. Procedure for Obtaining Environmental Clearance from DoE, Bangladesh

Bangladesh has very simple administrative framework regarding environmental aspect. It has strong interface between local government and federal Government. Department of Environment is responsible for grant of environmental clearance to a project. In addition to three are other ministries to deal with specific area of importance to the country like Forests, Water.

According to the Section 12 of the Environment Conservation Act 1995 no project will be established or undertaken without obtaining permission, in the manner prescribed by the Environment Conservation Rules 1997, an Environmental Clearance Certificate from the Director General. Therefore, every development projects/industries which are specified under the Schedule – 1 of the Environment Conservation Rules 1997 require obtaining site and environmental clearance from the Department of Environment. According to the Rule 7 (1) of the Environment Conservation Rules 1997; for the purpose of issuance of Environmental Clearance Certificate (ECC), every projects, in consideration of their site and impact on the environment and will be classified into the four categories, i.e. green, orange A, orange B and red. Development of industrial estate will fall under red category (S.No.39- Industrial Estate.). Thus, EIA study is required for the project. A schematic representation of the various steps

involved in obtaining the Environment Clearance certificate from DoE for red category projects is given in Figure below.

Figure 3: Steps for Obtaining Environment Clearance from DoE



an area broader than the sites or facilities subject to physical works. EA for a Category A project examines the project's potential negative and positive environmental impacts, compares them with those of feasible alternatives (including the "without project" situation), and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance. For a Category A project, the borrower is responsible for preparing a report, normally an EIA (or a suitably comprehensive regional or sectoral EA).

2.3. Project Categorization as per ADB

Similarly, as per safeguard policy of Proposed projects are screened and categorized as A, B, C¹ according to type, location, scale, and sensitivity and the magnitude of their potential environmental impacts, including direct, indirect, induced, and cumulative impacts. Considering the nature and extent of the envisaged impact, proposed Project is expected to be

¹ **Category FI.** A proposed project involves the investment of ADB funds to or through a financial intermediary.

classified as Category B as per ADB SPS 2009. If proper mitigation measures are ensured, then there will be no such irreversible impact on environment.

2.4. ADB Safeguard Policies 2009

The operational policies of the Asian Development Bank (ADB) include three safeguard policies: the Involuntary Resettlement Policy (1995), the Policy on Indigenous Peoples (1998), and the Environment Policy (2002). All three safeguard policies are due for revision. ADB needs to address emerging environmental and social challenges of development in its developing member countries (DMCs), respond to lessons learned from its experience with its current safeguard policies, and adapt to its new lending modalities and financing instruments. In addition, ADB policies need to reflect changing best practices of other multilateral financial institutions (MFIs) and of private sector institutions such as the equator principles financial institutions.

At an early stage of project preparation, the borrower/client to identify potential direct, indirect, cumulative and induced environmental impacts on and risks to physical, biological, socioeconomic, and physical cultural resources and determine their significance and scope, in consultation with stakeholders, including affected people and concerned NGOs. Once the potentially adverse environmental impacts and risks are identified, the borrower/client will undertake an environmental assessment as early as possible in the project cycle.

Impacts and risks to be analysed in the context of the project's area of influence². Depending on the significance of project impacts and risks, the assessment may comprise a full-scale environmental impact assessment (EIA) for category A projects, an initial environmental examination (IEE) or equivalent process for category B projects, or a desk review. An EIA report includes the following major elements: (i) executive summary, (ii) description of the project, (iii) description of the environment (with comprehensive baseline data), (iv) anticipated environmental impacts and mitigation measures, (v) analysis of alternatives, (vi) environmental management plan(s), (vii) consultation and information disclosure, and (viii) conclusion and recommendations. An IEE, with its narrower scope, may be conducted for projects with limited impacts that are few in number, generally site-specific, largely reversible, and readily addressed through mitigation measures.

2. Environmental Planning and Management

The borrower/client to prepare an environmental management plan (EMP) that addresses the potential impacts and risks identified by the environmental assessment. The EMP to include the proposed mitigation measures, environmental monitoring and reporting requirements, emergency response procedures, related institutional or organizational arrangements, capacity development and training measures, implementation schedule, cost estimates, and performance indicators.

3. Information Disclosure

The borrower/client to submit to ADB the following documents for disclosure on ADB's website:

² Area of Influence encompasses (i) the primary project site(s) and related facilities that the borrower/client (including its contractors) develops or controls, such as power transmission corridors, pipelines, canals, tunnels, access roads, borrow pits and disposal areas, and construction camps; (ii) associated facilities that are not funded as part of the project (funding may be provided separately by the borrower/client or by third parties), and whose viability and existence depend exclusively on the project and whose goods or services are essential for successful operation of the project; (iii) areas and communities potentially affected by cumulative impacts from further planned development of the project, other sources of similar impacts in the geographical area, any existing project or condition, and other project-related developments that are realistically defined at the time the assessment is undertaken; and (iv) areas and communities potentially affected by impacts from unplanned but predictable developments caused by the project that may occur later or at a different location.

(i) a draft full EIA (including the draft EMP) at least 120 days prior to ADB Board consideration, and/or environmental assessment and review frameworks before project appraisal, where applicable;

(ii) the final EIA/IEE;

(iii) a new or updated EIA/IEE and corrective action plan prepared during project implementation, if any; and

(iv) the environmental monitoring reports.

The borrower/client to provide relevant environmental information, including information from the documents in a timely manner, in an accessible place and in a form and language(s) understandable to affected people and other stakeholders.

4. Consultation and Participation

The borrower/client to carry out meaningful consultation with affected people and other concerned stakeholders, including civil society, and facilitate their informed participation. Meaningful consultation is a process that (i) begins early in the project preparation stage and is carried out on an ongoing basis throughout the project cycle; (ii) provides timely disclosure of relevant and adequate information that is understandable and readily accessible to affected people; (iii) is undertaken in an atmosphere free of intimidation or coercion; (iv) is gender inclusive and responsive, and tailored to the needs of disadvantaged and vulnerable groups; and (v) enables the incorporation of all relevant views of affected people and other stakeholders into decision making, such as project design, mitigation measures, the sharing of development benefits and opportunities, and implementation issues. Consultation will be carried out in a manner commensurate with the impacts on affected communities. The consultation process and its results are to be documented and reflected in the environmental assessment report.

5. Grievance Redress Mechanism

The borrower/client to establish a mechanism to receive and facilitate resolution of affected peoples' concerns, complaints, and grievances about the project's environmental performance. The grievance mechanism should address affected people's concerns and complaints promptly, using an understandable and transparent process that is gender responsive, culturally appropriate, and readily accessible to all segments of the affected people at no costs and without retribution. The mechanism should not impede access to the country's judicial or administrative remedies. The affected people will be appropriately informed about the mechanism.

6. Monitoring and Reporting

The borrower/client to monitor and measure the progress of implementation of the EMP. For projects likely to have significant adverse environmental impacts, the borrower/client to retain qualified and experienced external experts or qualified NGOs to verify its monitoring information. The borrower/client to prepare periodic monitoring reports that describe progress with implementation of the EMP and compliance issues and corrective actions, if any.

7. Biodiversity Conservation and Sustainable Natural Resource Management

The borrower/client to assess the significance of project impacts and risks on biodiversity and natural resources as an integral part of the environmental assessment process. The assessment to focus on the major threats to biodiversity, which include destruction of habitat and introduction of invasive alien species, and on the use of natural resources in an unsustainable manner. The borrower/client need to identify measures to avoid, minimize, or mitigate

potentially adverse impacts and risks and, as a last resort, propose compensatory measures, such as biodiversity offsets, to achieve no net loss or a net gain of the affected biodiversity.

8. Pollution Prevention and Abatement

During the design, construction, and operation of the project the borrower/client to apply pollution prevention and control technologies and practices consistent with international good practice, as reflected in internationally recognized standards such as the World Bank Group's Environment, Health and Safety Guidelines.

10. Health and Safety

The borrower/client to provide workers with a safe and healthy working environment, taking into account risks inherent to the particular sector and specific classes of hazards in the borrower's/client's work areas, including physical, chemical, biological, and radiological hazards. The borrower/client to apply preventive and protective measures consistent with international good practice, as reflected in internationally recognized standards such as the World Bank Group's Environment, Health and Safety Guidelines.

The borrower/client to identify and assess the risks to, and potential impacts on, the safety of affected communities during the design, construction, operation, and decommissioning of the project, and will establish preventive measures and plans to address them in a manner commensurate with the identified risks and impacts.

10. Physical Cultural Resources

The borrower/client is responsible for siting and designing the project to avoid significant damage to physical cultural resources. When the project is likely to have adverse impacts on physical cultural resources, the borrower/client to identify appropriate measures for avoiding or mitigating these impacts as part of the environmental planning process. These measures may range from avoidance to full site protection to selective mitigation, including salvage and documentation, in cases where a portion or all of the physical cultural resources may be lost.

3. Project Description

3.1. Introduction

The proposed EZ is spread over an area of 167.6 acres and it is located in the Maulvibazar Sadar Upazila, Maulvibazar District of the Sylhet Division, at the point at which Dhaka – Sylhet Highway and Sylhet – Maulvibazar Highway converge at Sherpur. The site is 35 Km from Sylhet and 23 Km from Maulvibazar. Sreemangal Railway Station is 43 Km away from the proposed site.

3.2. Objective

The project objective is to develop a multi sector Economic Zone in the Maulvibazar Sadar Upazila, Maulvibazar District of the Sylhet Division. The aim of setting up an EZ is to develop various industries in the region along with excellent state-of-the art infrastructure facilities and professional management to attract and support investments in industrial sectors.

The type of industries to be accommodated within EZ are as follows-

- | | | |
|--------------------------------|------------------------------------|---------------------------------|
| 1. <i>Spinning Mills</i> | 4. <i>Glass Processing Factory</i> | 7. <i>Aluminium Ball</i> |
| 2. <i>Garments Accessories</i> | 5. <i>Ceramic Tiles Factory</i> | 8. <i>Sanitary Ware</i> |
| 3. <i>Glass Factory</i> | 6. <i>Ceramic Frit</i> | 9. <i>Abrasive Tool Factory</i> |

3.3. Project Option

DBL Industrial Park Limited is a Private Limited Company, playing role as a “Developer” in this project. The project is envisioned to develop a portion of the Shreehatta Economic Zone complying infrastructural and community facilities aligning the prime objective of Bangladesh Economic Zone Authority (BEZA) to attract investors for large manufacturing and service industry.

The zone will have access to utilities such as power, water and gas which are critical enablers for development of economic zone. There is adequate supply of unskilled labor from the rural areas in the vicinity, however skilled and semi-skilled labor needs to be procured from the nearby urban agglomerations since there is a dearth of quality educational infrastructure in the region.

3.4. Proposed Interventions & Project Activities

Site for the EZ has been selected for development of economic zone. Scope of the proposed project is to develop EZ and on-site facilities for upcoming EZ zone. These EZ facilities will be developed by DBL Industrial Park Limited. Proposed development will help in improving the infrastructure of the EZ area. Proposed interventions at the selected site are given below:

- **Site development & Land Filling**– The average natural ground level for the proposed EZ was +6.66 m AMSL level. To avoid inundation during monsoon season, the land filling of 3.34 m above the existing natural ground level is considered. The finished ground level for the proposed EZ will be around +10.0 m from above Mean Sea Level. An average depth of 9 feet to 13 feet of land filling has been envisaged for the proposed EZ area.

- Boundary Wall Construction
- Road, Footpath and Master drainage line construction
- Creation of industrial Plots (09 no's)
- Administrative & residential building
- Development of water supply, Electricity supply and Gas supply network
- Development of sewer system network
- Development of STPs, RMS Gas station, Mini Fire Office, Water body

3.5. Project and Proposed Facilities

The Masterplan of proposed DBL Industrial Park alongwith area breakup is furnished in following section

Figure 4: Master plan of EZ³



Source: Masterplan DBL Industrial Park

³ Masterplan of Larger scale provided in Appendix C

Table 6: Area Breakup for Proposed EZ

Area	In SQM	In Acre	Percentage%
Land Area	6,78,253 SQM	167.60 Acre	100%
Building Area	3,60,540 SQM	89.09 Acre	53.16%
Road Area	85,866 SQM	21.22 Acre	12.66%
Footpath Area	33,370 SQM	8.25 Acre	04.92%
Open Area	1,98,477 SQM	49.04 Acre	29.26%

Source: Masterplan DBL Industrial Park

The geographical coordinates UTM) of proposed EZ site boundary is furnished in **Appendix B**.

As a part of proposed development, following infrastructure components are also planned to cater the need of upcoming EZ.

Roads

Proposed DBL Industrial Park is connected with all the major locations of Bangladesh by road. The EZ site abuts the Dhaka – Sylhet national highway. It is spread on both sides of the 2 lane highway and is presently below the road level. Currently, this highway is catering to passenger buses and trucks destined for Northern Bangladesh. The EZ is about 20 Km to the nearest town of Maulvibazar (district headquarter) and about 25 Km from the Upazila headquarters and about 35 Km from Sylhet. Dhaka lies at a distance of about 208 Km from this point. Chittagong Port is about 340 Km from this site. The Sherpur market is just 1 km away from the site. Sylhet Dhaka highway will be access road for the site.

Primary and secondary roads are planned to give access to the industries within EZ. These are looped and planned with the aim of providing smooth and dispersed traffic flow to reduce traffic congestion within EZ.

Category	Road Width (m)	Carriage way width (m)	Length (m)		
			Processing area	Non-Processing area	Total
Primary Road	19.8	15	1015	-	1015
Secondary Road	17.3	12.5	3711	501	4212
	14.8	10	1483	-	1483

Power Supply

A 230KV high voltage line passing through the site and a power line of 0.4 KV is also available in the site.

Water Supply

Surface water is available from the Kushiya River within 1 Km. There is a large water body in the southern part of the site.

The incoming raw water from deep tube well will be storage in Underground water tanks. From these tanks, water shall be pumped to overhead water storage tanks at roof of each

building through domestic water transfer pumps. The water distribution system will be by gravity through a pipe network.

Sewage Management

STP is proposed for sewage management. The entire sewer network is planned along the proposed roads of EZ. The detailed design of the STP is provided in **Appendix J**.

Proposed Sewage Treatment Plant (STP) will recover the recycled water of quality suitable for use as toilet flushing, irrigation, car washing. Overflow of STP treated water will be discharged to the adjacent external storm water drainage network.

All traps of water closets shall be completely vented in the system. Waste pipe from all the fixtures shall be connected to the floor trap. Finally, the floor trap shall be connected to the waste pipe stack. Waste pipe stacks shall be connected to pits, Sewage from water closets and urinals shall be connected to pits and septic tank, the combined sewage shall be conveyed by gravity through a network of pipes and pits.

Drainage Management

Based on the site gradient, the drainage pattern has been decided. It is planned to establish the drain along the periphery and along the sides of the proposed road network and is finally discharging into the existing water body. It has been planned to discharge the flow of the internal drain into suitable discharge points.

- The drainage system is planned to cater for the entire EZ through gravity flow.
- Drains are proposed to be provided on both sides of the roads and along the periphery.
- Master drainage system has been designed though RCC Circular pipe along the periphery.
- Covered rectangular brick masonry drain along the sides of the proposed road network is considered for the remaining areas for optimization of area under drainage.
- RCC box / pipe culverts of suitable sizes are considered for road crossings.
- Provision for Rainwater harvesting structures are envisaged for each plot.

The rainwater from roof, verandah and other open areas shall be collected through rainwater down stack pipes which shall be discharged through pit at ground level. Number of rainwater stacks to be provided in the building shall be taken as per code. The rainwater disposal shall be by gravity through a network of sloping pipes and Pits. It shall be finally connected to the rainwater harvesting tanks located at ground level. Overflow from rainwater harvesting tank shall be connected to external storm water drainage network. Finally, rainwater will be discharged to the nearest water body.

Beside development of DBL Industrial Park, associated infrastructures like access roads, power supply system, C grade Tiles store, Employee Residence, Worker Residence etc. will be developed in the project area as per master plan design.

Following Layout plans are furnished in **Appendix – C⁴**

- Internal Road Network
- HT and Gasline Network

⁴ Source: DBL Industrial Park Limited

- Rainwater Disposal Route Plan
- Sewerage Disposal Route Plan
- Water Supply Route Plan
- ETP & Effluent Discharge Plan

3.6. Utility Requirement for the Project

Component	Residential area	Processing area	UOM	Source during Construction and Operation Stage
Electricity	6,720	67,500	kW	Power will be sourced from Rural Electrical Board (REB). Also 1 common captive power plant will be installed
Gas	3,360	1,363,237	cft/hr	Jalalabad Gas Company located in nearby area of proposed EZ site
Water	553	37,810	m ³ /Day	A deep tube-well has been planned by BEZA (to be located towards NE side of proposed site) Water will also be abstracted from the nearby waterbody (called Gong) located towards southern side of EZ boundary

Breakup for Utility requirement is furnished in **Appendix D**.⁵

3.7. Project Schedule

Name of Items	2018	2019				2020				2021				2022	
	Oct - Dec	Jan - Mar	Apr - Jun	Jul - Sep	Oct - Dec	Jan - Mar	Apr - Jun	Jul - Sep	Oct - Dec	Jan - Mar	Apr - Jun	Jul - Sep	Oct - Dec	Jan - Mar	Apr - Jun
Land Development Work															
Boundary Wall Construction															
Internal Road and Footpath															
Periphery-RCC Master Drainage line															

⁵ Source: DBL Industrial Park Limited

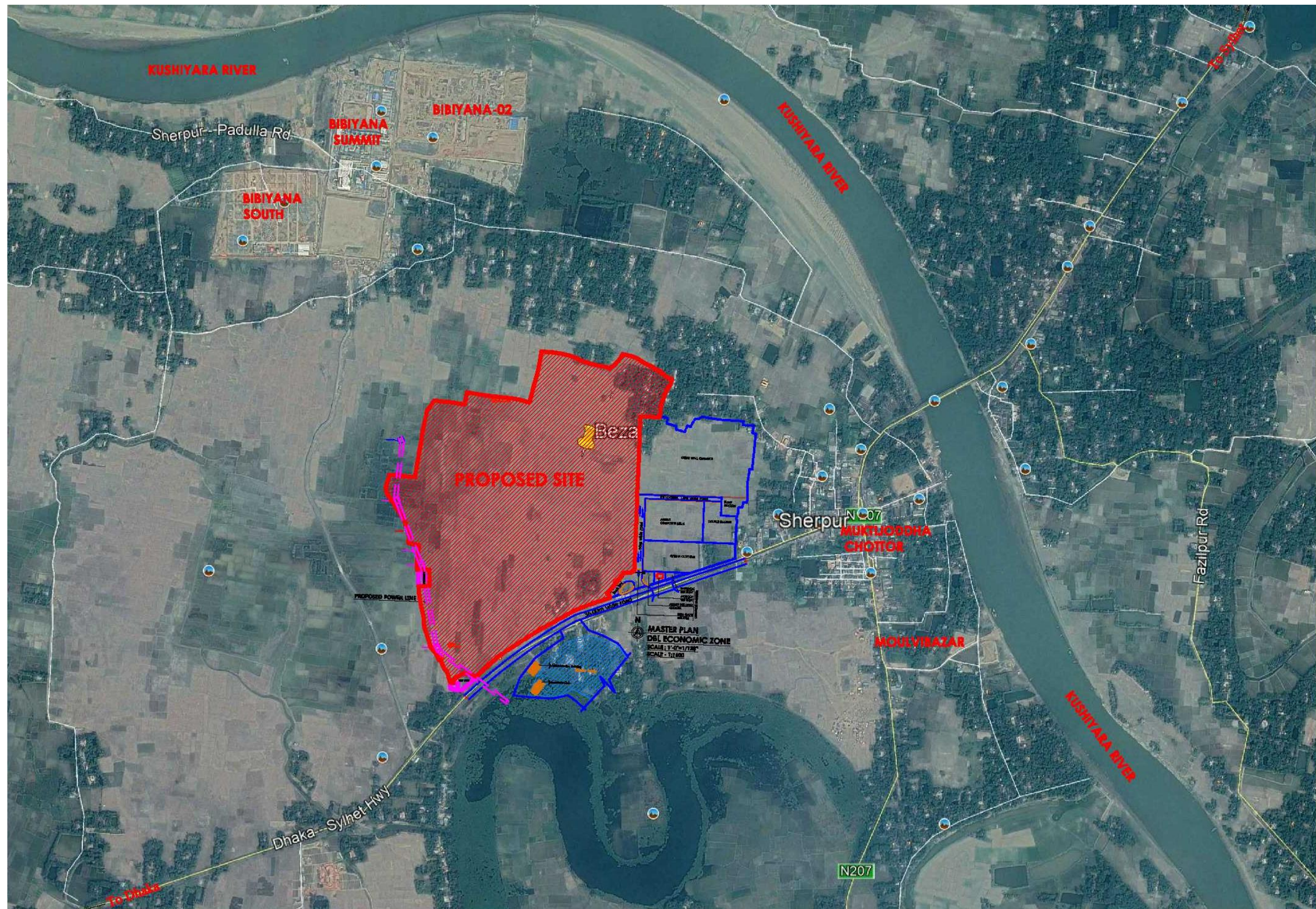
Name of Items	2018	2019				2020				2021				2022	
	Oct - Dec	Jan - Mar	Apr - Jun	Jul - Sep	Oct - Dec	Jan - Mar	Apr - Jun	Jul - Sep	Oct - Dec	Jan - Mar	Apr - Jun	Jul - Sep	Oct - Dec	Jan - Mar	Apr - Jun
Internal Drainage Line															
Fire Brigade Office															
RMS Gas station															
Residential and Administrative building															

3.8. Map and Survey Information

Project Location

The project site of DBL Industrial Park e is located at Sherpur and Bamongaon Mouza in Maulvibazar Sadar upazila of Moulvi Bazar District in Sylhet Divison of Bangladesh.

Figure 5: Location of the proposed EZ shown on Google Earth



Source: DBL

3.9. Project Master Plan

The Project Master Plan and other developments' designs are provided in Annex C.1. to Annex C.7.

3.10. Tentative Project Cost

- **Cost for Zone Development- 232.26 Crores**
 - Land Lease Payment: 85.86 Crores
 - Sand Filling Cost: 35.80 Crores
 - Infrastructure Development Cost: 110.6 Crores
- **Factory Construction Cost- 4512.50 Crores**

4. Environmental and Social Baseline

This section establishes the baseline environmental status of the proposed economic zone and surrounding area to determine the project influence area within which the impacts of the Project are to be assessed.

Establishing baseline helps in understanding the prevailing environmental and socio economic status of the Proposed Site. It provides the background environmental and social conditions for anticipation of the future environmental characteristics of the area based on the operation of the new activity of the project during its life cycle. It also helps in environmental management planning and strategy to minimize any potential impact due to the Project activities on surrounding environment. Field surveys were conducted at the project site to collect the requisite baseline information through discussions with project proponents, concerned institutional stakeholders and local people. The baseline information has been collected pertaining to:

- The physical environment (meteorological condition, air, water, land, soil, noise etc.)
- The Biological environment (Ecological condition, Biodiversity etc.)
- The socio-economic and cultural environment

4.1. Methodology

To assess environmental and social baseline of the project area a survey was conducted to identify environmental and social sensitive receptors located within and around the project area. The Proposed Site considered as 10 KM radius around the EZ site. The project activity areas are considered as core area and remaining Proposed Site as buffer zone. Environmental baseline data was collected through primary surveys as well from secondary sources by literature study and discussions with various stakeholders.

4.2. Proposed Site

The Proposed Site considered as 10 KM radius around the proposed EZ site. The project activity areas are considered as core area and remaining Proposed Site as buffer zone. Environment setting of 10 km radius area around EZ site has been presented in the following table and figure.

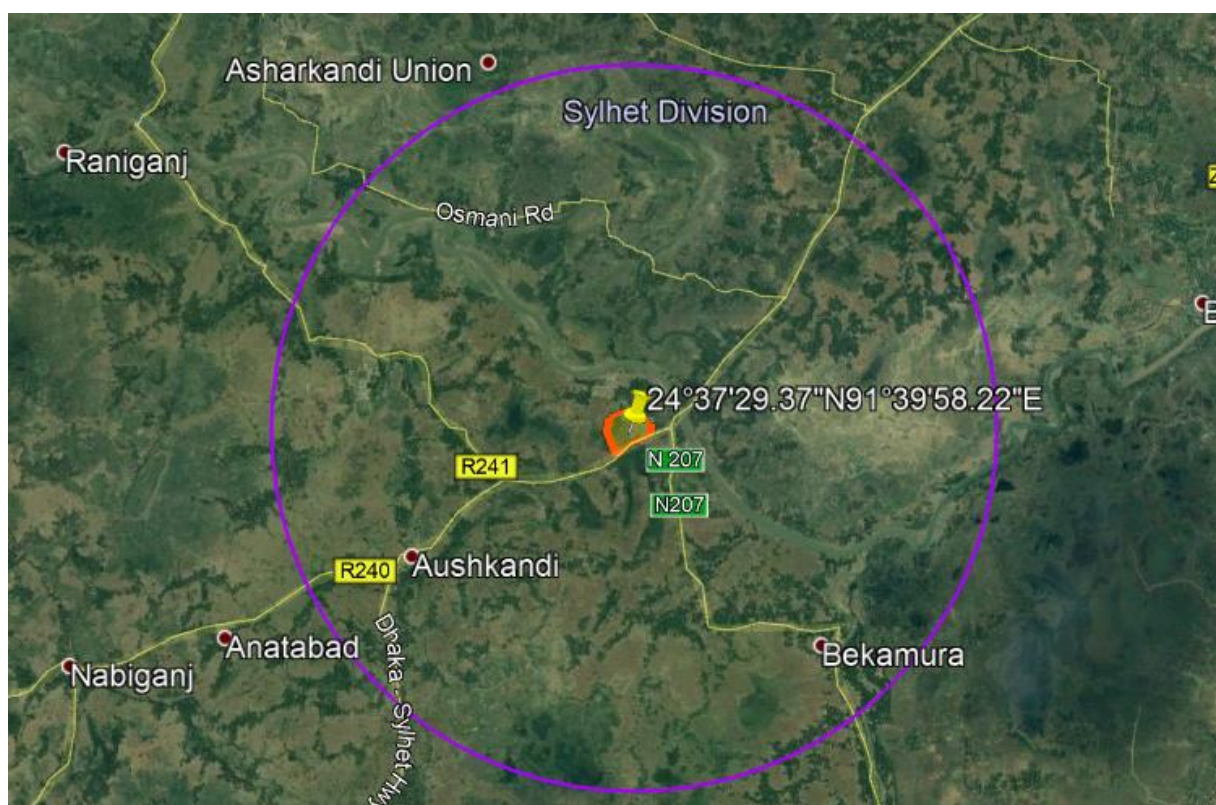
Table 7: Environmental Setting of Project Surrounding Area

Particulars	Details
Location	Sherpur & Bamongaon Mouza, Maulvibazar Sadar Upzila, Maulvibazar District, Sylhet Division, along Dhaka Sylhet Highway Coordinate: Latitude: 24°37'29.37"N Longitude: 91°39'58.22"E
Nearby Village	Open land (N) Muzlishpur (SE) Bamangaon (NE) Dhaka-Sylhet Highway (S)

Particulars	Details
Nearest Airport	Osmani International Airport (55 km, NE)
Nearest Railway Station	Sylhet Rail Station (35 km, NW) Sreemangal Rail Station (43 km, S)
Nearest Port	Ashuganj Ruver Terminal (108 km, SW)
Seismic Zone	Zone I
Forests / National Parks	None within 10 kms
Archaeologically important places/monuments	None within 300 m from the EZ site

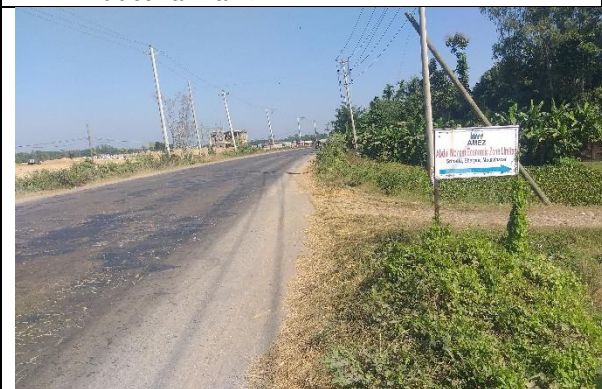
Source: Google Earth & Site Visits

Figure 6: Map Showing Environmental Settings within 10 km Radius of Project Site



Source: Google Earth

Figure 7: Photographs of Proposed Project Site and Proposed Site

	
View of Kusiya River located at the vicinity of proposed EZ	
	
Proposed source of Electricity for DBL Industrial Park within the project boundary	Proposed source of natural gas - Jalabad Gas
	
Dhaka-Sylhet Highway located in the south of DBL Industrial Park	Risky area for Dhaka- Sylhet Highway
	
Starting point- Proposed Abdul Momen Economic Zone located in the South of DBL Industrial Park	A GRID line across in the west side of DBL Industrial Park

4.3. Baseline Data Collection and Monitoring Stations

The present ESIA Report has been prepared based on the Primary field investigations / assessment, and secondary data from data collected from Forest Department, Bangladesh Meteorological Department, Bangladesh Bureau of Statistics, baseline studies, DoE, published journals, books, public consultation and site observations. Towards assessing baseline condition Water sample (Surface & Ground) were analysed and Ambient Air Quality & Noise Level were monitored at project area. Secondary data available on air quality, water quality and soil quality is also studied for defining the baseline environment of the area.

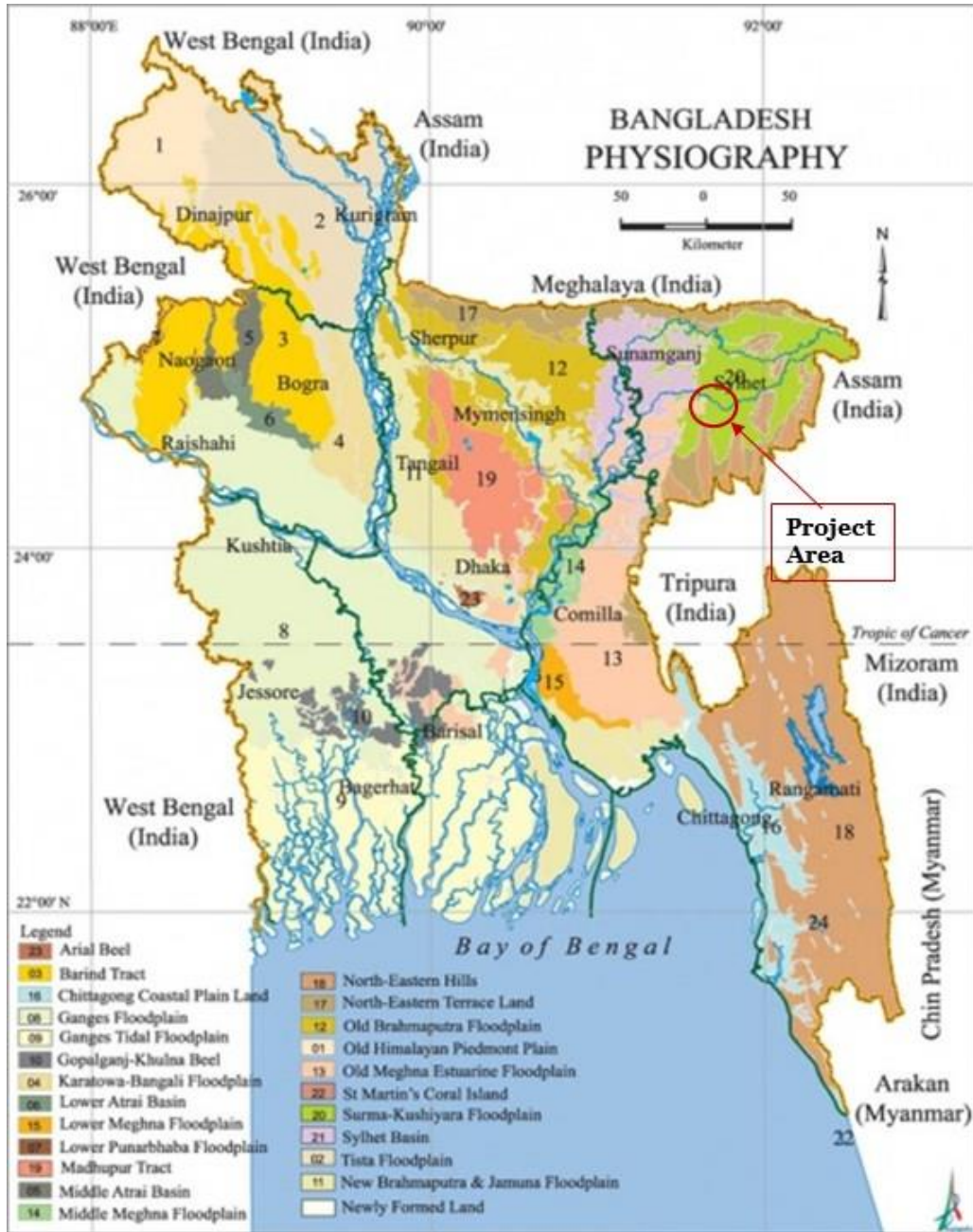
4.3.1. Physical Environment

4.3.1.1 Topography of the Project Site

Bangladesh is the largest deltaic region in the world with most of its parts, at low elevations. It is a riverine country criss-crossed by innumerable rivers, rivulets and their tributaries. The country is broadly divided into three physical regions- the Ganges Delta proper to the southwest, the Paradelta to the northeast, and the southeast undulating Moulvibazar region.

Ganges total flood plains is the tidal landscape has a low ridge and a basin relief crossed by many tidal rivers and creeks. Local differences in height are generally less than 1 m compared with 2-3 m on the Ganges floodplain. As per the physiographic map of Bangladesh the Proposed Site falls under the Surma Kushiya Flood Plains.

Figure 8: Physiographic Map of Bangladesh



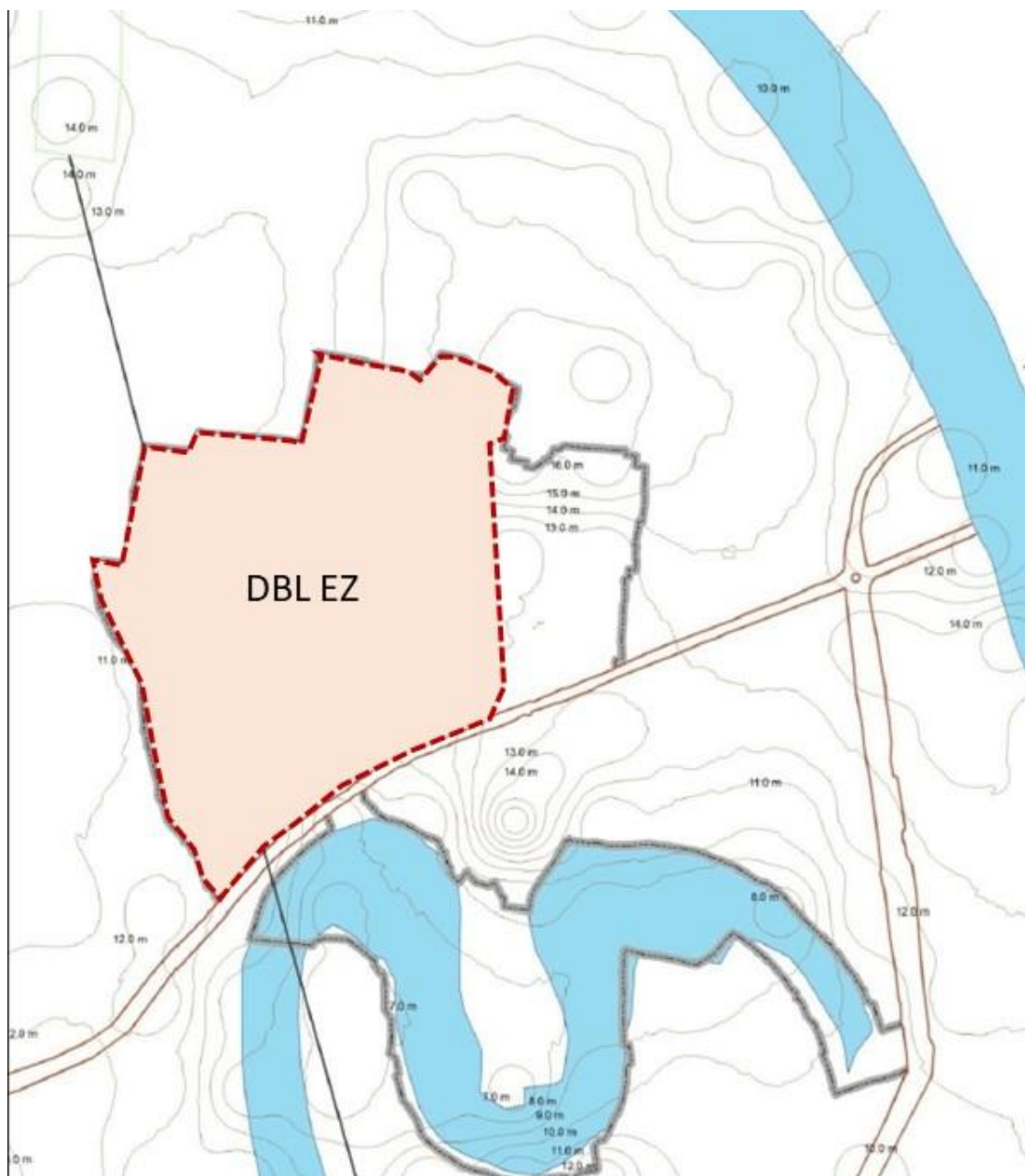
Source: Banglapedia

EZ site is located adjacent to Dhaka Sylhet Highway towards its northern side. Proposed EZ site is generally flat and the average natural ground level for the proposed EZ was +6.66 m AMSL level. To avoid inundation during monsoon season, the land filling of 3.34 m above the existing natural ground level is considered⁶.

The finished ground level for the proposed EZ will be around +10.0 m from above Mean Sea Level. An average depth of 9 feet to 13 feet of land filling has been envisaged for the proposed EZ area

Figure 9: Contour Map of EZ surrounding area

⁶ Information provided by DBL Industrial Park Limited

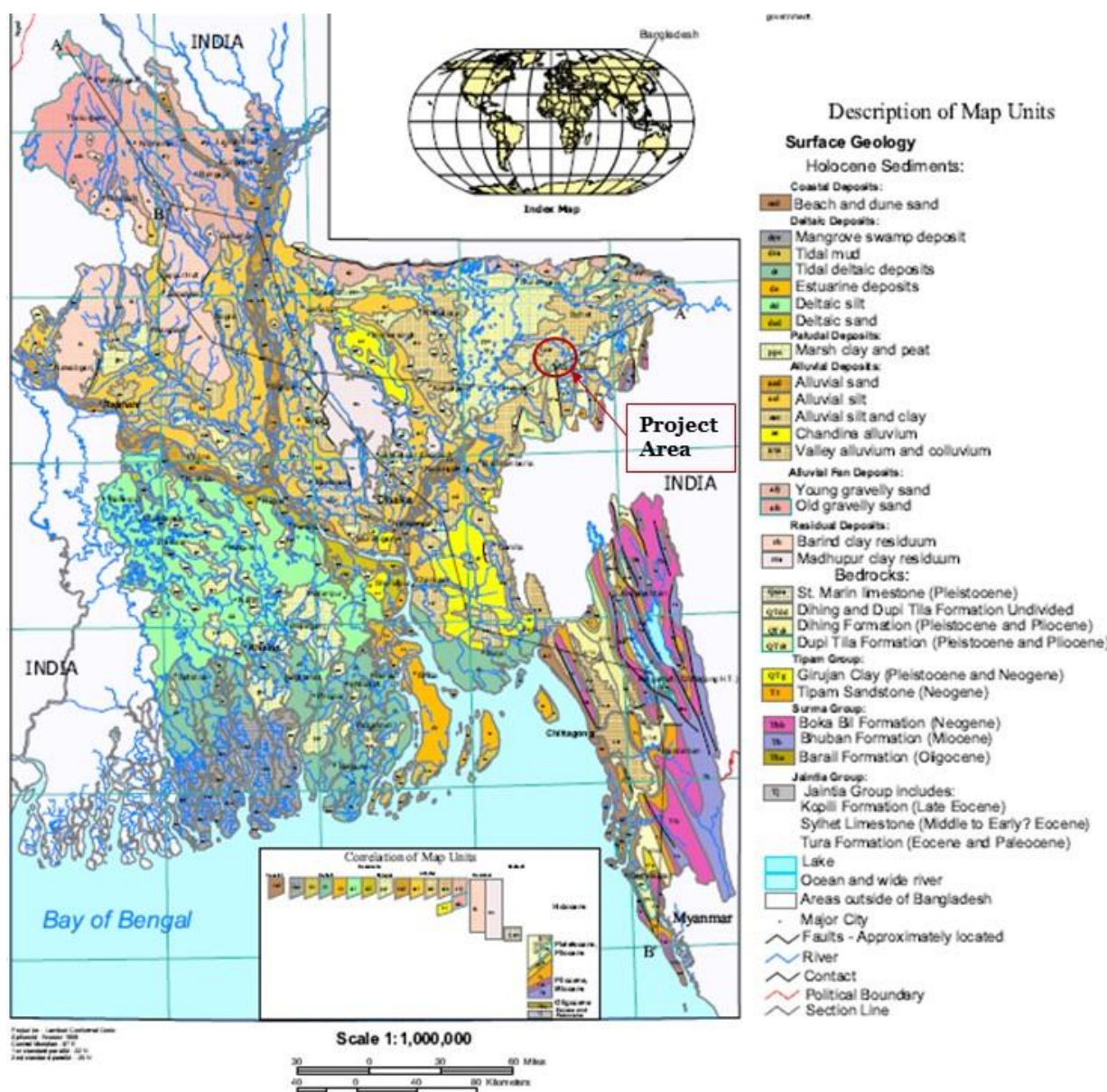


Source: Feasibility Report, Sherpur EZ & Information shared by DBL Industrial Park Limited

4.3.1.2 Geology

The geology of the project area can be generally be classified as Alluvium and stream/flood plain deposits and is part of Surma-Kushiyara flood plains. Kushiyara river is located at about 900 m distance from EZ site towards Eastern side. Kushiyara river is formed from the Barak river thus carried the sediments of Eastern Himalayas and are classified as Surma group sediments. In most of the Surma flood plain, there is no annual deposition of new sediments; however the soils are older and more developed, and in rainy season, flood water is clear. Soil in the area is silty to loamy topsoils and silty to clayey sub-soils. Most soils overlie stratified material at 2-5 feet depth. Almost all soils are seasonally flooded, and dry out by the middle of the dry season. Geological map of Bangladesh showing Geological classification of Proposed Site furnished in below figure. According to Geological map of Bangladesh, the proposed site is located in Alluvial Silt and Clay zone.

Figure 10: Geological map of Bangladesh showing proposed site area



Source: GSB

4.3.2. Meteorology

The project area lies in the North-Eastern climate zone of the country and have tropical monsoon climate. There are three main seasons, i.e. Southwest Monsoon (May to October), Northeast Monsoon (November to February) and pre-monsoon season (March to April). Meteorological condition has been established using data on different metrological parameters accumulated from Bangladesh Meteorological Department for Sreemangal station. Summary of the analysis of metrological parameters are given in the following sections.

Figure 11: Climate Region Map of Bangladesh



Source: BMD

4.3.2.1. Temperature

Meteorological monitoring station of BMD located at Sreemangal about 37 Km away (towards Southern side) from proposed project site is considered for establishing temperature profile of the project area. The average minimum temperature varies between 7.5 to 25.9 °C whereas maximum temperature ranges from 23.7 to 35.1 °C. Monthly mean minimum and maximum temperatures for the period 2009-2018 for Sreemangal Station are furnished in below tables.

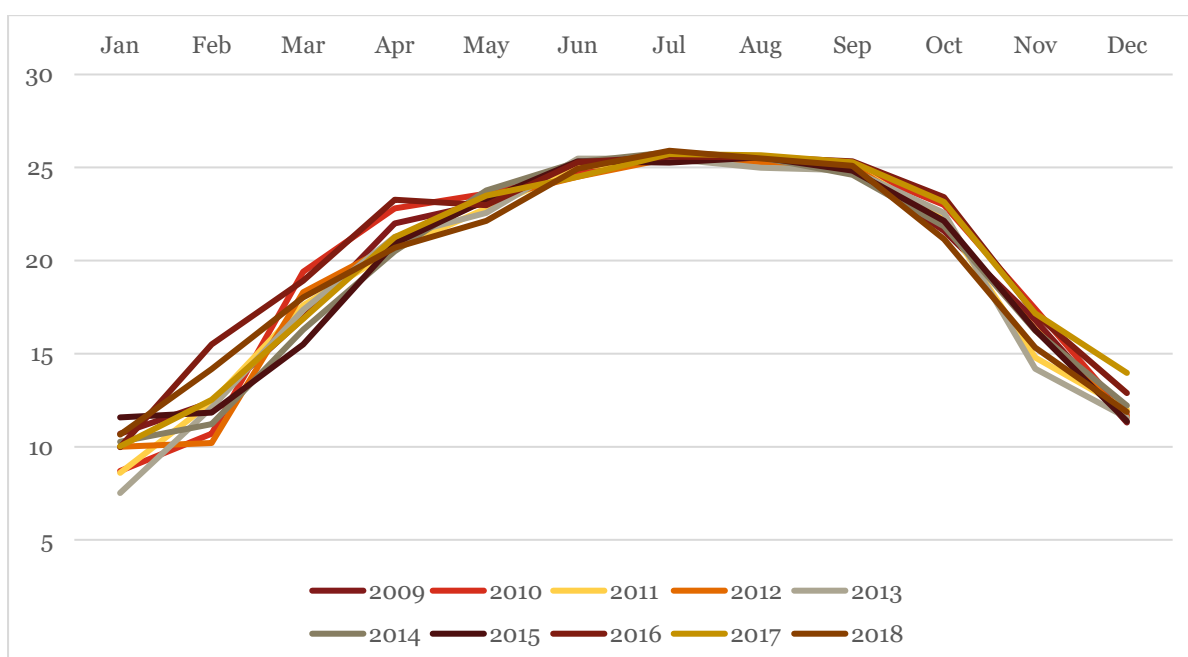
Table 8: Monthly minimum (mean) temperature (°C) (2009 to 2018)

Year	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Spt.	Oct.	Nov.	Dec.
2009	10.7	12.4	16.9	22	23.1	24.8	25.5	25.6	24.9	21.6	16.8	11.3

Year	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Spt.	Oct.	Nov.	Dec.
2010	8.7	10.7	19.4	22.8	23.6	24.7	25.6	25.4	25	23	17.4	11.7
2011	8.6	12.4	17.6	20.6	22.8	25	25.5	25.3	25.1	22.2	14.8	12
2012	10	10.2	18.3	20.9	23.3	24.5	25.5	25.3	25.1	22	16.3	11.6
2013	7.5	12.1	17.4	21.3	22.6	25.5	25.5	25.0	24.8	22.6	14.2	11.6
2014	10.3	11.2	16.3	20.5	23.8	25.3	25.8	25.5	24.6	21.9	16.2	12.2
2015	11.6	11.8	15.5	20.9	23.2	25.3	25.3	25.5	24.8	22.1	16.3	11.4
2016	10.0	15.5	18.9	23.3	23.0	25.3	25.6	25.6	25.3	23.4	17.1	12.9
2017	10.0	12.5	16.9	21.3	23.5	24.5	25.7	25.7	25.3	23.1	17.2	14.0
2018	10.7	14.2	18.0	20.7	22.1	24.9	25.9	25.5	25.1	21.2	15.3	11.9

Source: BMD

Figure 12: Monthly minimum (mean) temperature (°C) (2009 to 2018)



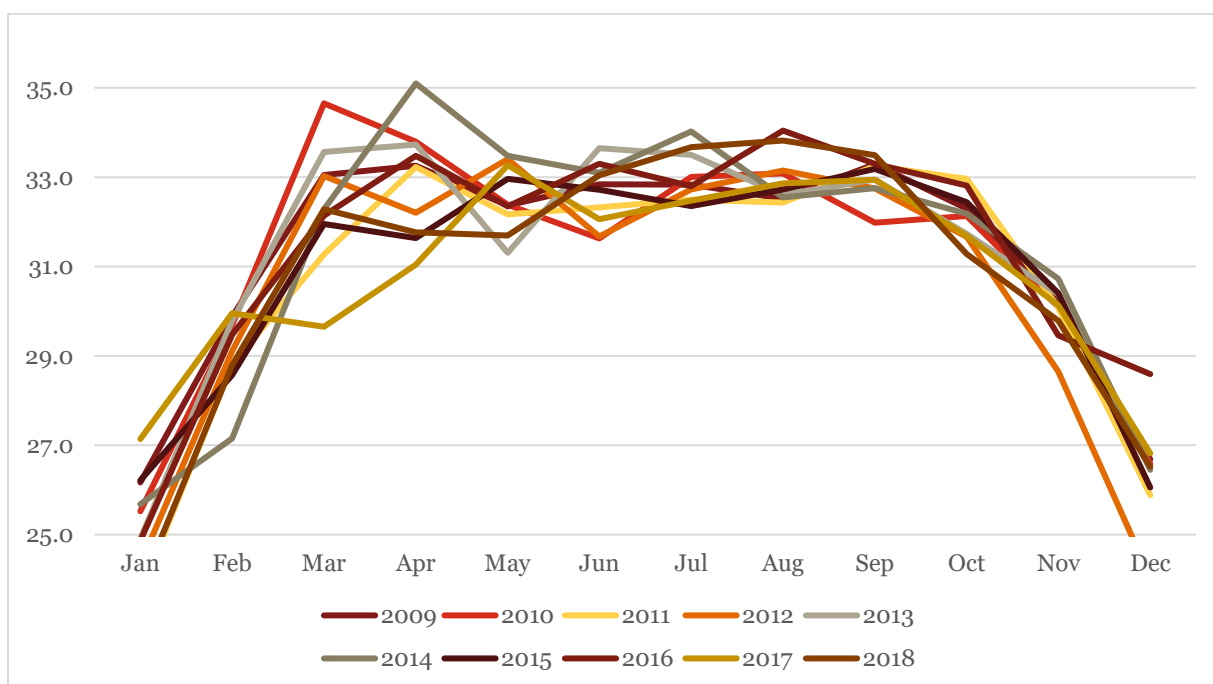
Source: BMD & PwC Analysis

Table 9: Monthly maximum (mean) temperature (°C) (2009 to 2018)

Year	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Spt.	Oct.	Nov.	Dec.
2009	26.2	29.9	33.0	33.3	32.4	32.8	32.8	32.5	33.3	32.3	30.2	26.7
2010	25.5	29.7	34.7	33.8	32.4	31.6	33.0	33.1	32.0	32.1	30.1	26.6
2011	23.7	28.8	31.3	33.2	32.2	32.3	32.5	32.4	33.3	33.0	30.1	25.9
2012	24.3	29.1	33.0	32.2	33.4	31.7	32.7	33.1	32.8	31.7	28.7	24.0
2013	24.9	29.8	33.6	33.7	31.3	33.7	33.5	32.6	33.0	31.7	30.4	26.5
2014	25.7	27.2	32.3	35.1	33.5	33.1	34.0	32.5	32.8	32.2	30.7	26.4
2015	26.2	28.6	32.0	31.6	33.0	32.7	32.4	32.7	33.2	32.4	30.4	26.1
2016	24.9	29.5	32.1	33.5	32.3	33.3	32.8	34.0	33.3	32.8	29.5	28.6
2017	27.1	30.0	29.6	31.0	33.3	32.1	32.5	32.9	32.9	31.7	30.1	26.8
2018	23.8	28.8	32.3	31.8	31.7	33.0	33.7	33.8	33.5	31.3	29.8	26.5

Source: BMD

Figure 13: Monthly maximum (mean) temperature (°C) (2009 to 2018)



Source: BMD & PwC Analysis

4.3.2.2. Humidity

Meteorological monitoring station of BMD located at Sreemangal about 37 Km away (towards Southern side) from proposed project site is considered for establishing humidity condition of the project area. The average humidity at project area varies between 64 % to 88 %. The average humidity for the period 2009 to 2018 for project area is provided in below table. The data shows that average humidity does not vary much with the change in seasons and is relatively high.

Table 10: Monthly average relative humidity (in %) during Jan 2009 to Dec 2018

Year	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Spt.	Oct.	Nov.	Dec.
2009	82	71	67	76	80	83	83	86	86	85	82	84
2010	84	69	64	75	81	86	85	86	88	86	82	82
2011	82	74	70	74	82	84	84	86	84	82	80	84
2012	79	65	66	76	79	85	83	83	85	85	83	88
2013	80	72	67	73	83	83	84	86	85	85	81	83
2014	83	77	69	72	80	86	83	86	86	84	81	85
2015	81	76	71	79	83	83	85	86	85	85	83	84
2016	83	78	77	78	83	84	84	83	86	85	84	83
2017	80	72	77	81	80	87	85	85	88	87	84	87
2018	86	78	73	79	84	84	84	84	85	85	83	83

Source: BMD

4.3.2.3. Rainfall

Meteorological monitoring station of BMD located at Sreemangal about 37 Km away (towards Southern side) from proposed project site is considered for establishing rainfall pattern of the project area. Average yearly rainfall between 2009 to 2018 in the area is 2442 mm. The average

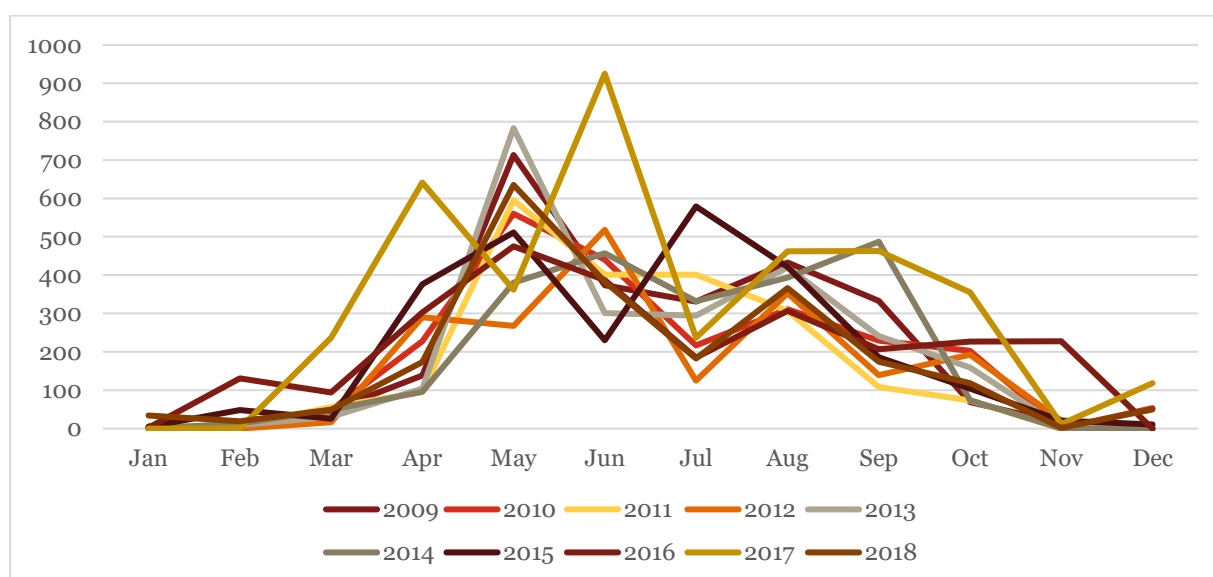
monthly rainfall pattern for the project area is provided in table below. The data shows that rainy season in project area mainly prevails from May to September. Rainy season is very prominent in this region like other areas of the country.

Table 11: Rainfall (in mm) pattern in Project Area (Jan 2009 to Dec 2018)

Year	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Spt.	Oct.	Nov.	Dec.	Annual
2009	0	1	47	138	713	374	331	433	333	69	13	0	2452
2010	0	0	48	228	560	440	217	311	229	203	1	53	2290
2011	6	7	56	96	595	401	401	307	108	73	0	0	2050
2012	3	0	17	290	268	518	125	353	139	193	21	0	1927
2013	0	9	31	104	783	301	294	420	241	159	5	5	2352
2014	0	13	49	96	380	457	332	394	487	74	0	0	2282
2015	5	48	26	376	511	230	579	421	186	104	21	11	2518
2016	2	131	94	303	475	387	185	307	207	227	228	0	2546
2017	0	1	237	641	362	925	237	462	463	355	12	118	3813
2018	34	19	49	173	635	383	183	366	174	118	2	50	2186
Ave	5	23	65	245	528	442	288	377	257	158	30	24	2442

Source: BMD

Figure 14: Rainfall (in mm) pattern in Project Area (Jan 2009 to Dec 2018)



Source: BMD & PwC Analysis

4.3.2.4. Evaporation

Evaporation in the project area reaches its maximum level in between April-May when temperature, sunshine and wind are all at, or close to, their maximum levels for the year. Potential evaporation data Sreemangal Station is presented in table below.

Table 12: Monthly Average Evaporation Data (Period: 2009-2017)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2009	24	39	49	49	49	42	46	39	38	38	30	22
2010	21	37	55	51	43	30	40	38	29	36	33	23
2011	22	37	46	47	-	39	35	30	36	29	26	19

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2012	22	42	43	38	50	32	43	43	38	29	23	21
2013	28	43	50	54	29	26	24	23	28	27	27	19
2014	16	14	25	24	54	12	13	15	19	24	16	11
2015	13	17	26	24	25	21	19	18	19	17	14	9
2016	9	15	18	29	26	26	21	27	20	23	15	20
2017	14	19	18	23	27	21	21	22	19	17	-	-

Source: BMD;

4.3.2.5. Wind Speed and Direction

Like the country's wind characteristics, the region is characterized by Southerly wind from the Bay of Bengal during monsoon and Northwesterly wind from Himalaya during winter. Data on Monthly Prevailing Wind Speed (in Knots) and Direction recorded in Sreemangal station from 2009 to 2018 is given in table below.

Table 13: Wind Speed (in Knots) and Direction recorded in Project Area (2009 to 2018)

Month	Speed & Direction	Year									
		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Jan.	Spd	4.1	3	2.5	2.9	2.8	1.8	3.9	2.3	2.3	3.9
	Dir	W	NW	NW	WNW	NW	W	WNW	WNW	W	WNW
Feb.	Spd	4	3.5	3.3	3.9	3.2	2.1	2.9	2.9	2.8	3.6
	Dir	W	NW	NW	W	W	W	W	W	W	W
Mar.	Spd	3.3	5.2	6	4	3.3	3.2	3.9	2.4	2.5	3.3
	Dir	S	S	S	NW	W	WNW	WNW	W	SE	NE
Apr.	Spd	3.8	5.5	2.5	3.7	2.9	2.6	2.4	3.8	3.6	2.5
	Dir	S	S	W	SE	SE	W	SE	S	S	E
May	Spd	3.3	2.9	3	3.2	3.1	3.3	2.5	2.4	2.4	2.6
	Dir	E	SE	SE	S	SE	S	E	SE	SE	E
Jun.	Spd	2.7	2.8	2.8	3.2	3.1	2.8	3.3	2	2.3	2.2
	Dir	S	SE	SE	SE	SE	S	SE	SE	SE	SE
Jul.	Spd	3.6	2.5	2.7	3.2	2.7	2.7	2.4	2.8	2.3	2.1
	Dir	S	SE	SE	SE	SE	SE	SE	SSE	SE	SE
Aug.	Spd	3.2	2.4	2.6	2.5	2.3	2.9	3	2.1	2.1	2
	Dir	S	SE	SE	SE	SE	S	SSE	SE	S	E
Sep.	Spd	2.5	2.1	2.7	2.4	2.2	2.6	2.3	2	2.6	2
	Dir	SE	SE	SE	SE	SE	SE	SE	SE	SSE	S
Oct.	Spd	2.3	2	2.7	2.3	2.1	2.3	2.2	2.4	3.3	1.6
	Dir	SE	NE	W	S	SE	NE	NW	SE	NE	NE
Nov.	Spd	3.4	2	1.9	2.2	1.3	2.1	2.1	2	1.8	1.9
	Dir	W	NE	NW	NE	NNE	W	ENE	E	NNW	S
Dec.	Spd	2.4	2.5	2.3	2	1.9	2.1	2.2	2	2.3	2
	Dir	WNW	NW	WNW	W	ENE	WNW	WNW	W	NNW	NW

Source: BMD;

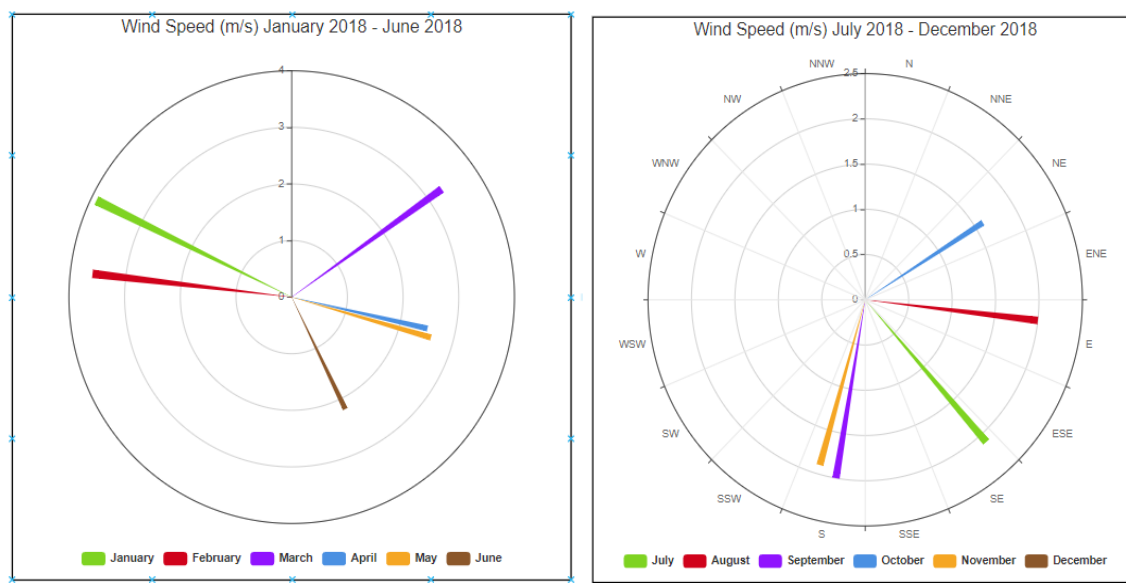


Figure 15 Wind Speed (in Knots) and Direction recorded in Project Area (January 2018 to June 2018)

4.3.2.6. Sunshine Hours

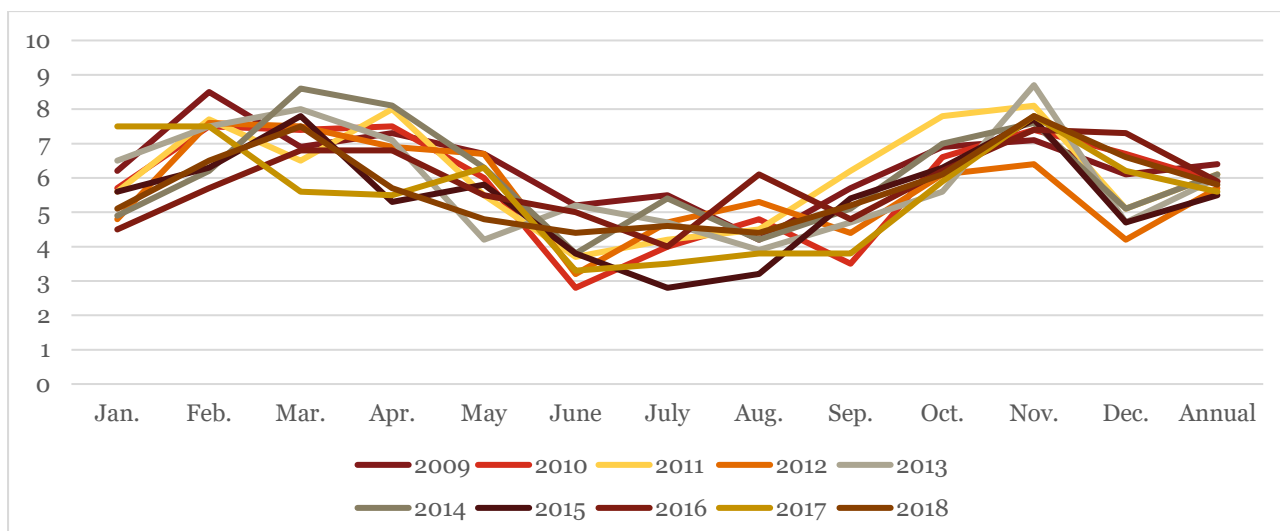
The monthly average sun-shine hour in Sreemangal varies from 2.8 to 8.7 hours/day. Highest Monthly Average sunshine hours are recorded in month of November (Period Jan-2009 to Dec-2018). Monthly average Sunshine hours of the project area is furnished in below table.

Table 14: Monthly average Sunshine Hours/Day (Jan 2009 to Dec 2018)

Year	Jan	Feb	Mar	Apr	Ma y	Jun e	Jul y	Aug	Sep	Oct	Nov	Dec	Annua l
2009	6.2	8.5	6.9	7.3	6.7	5.2	5.5	4.2	5.7	6.9	7.1	6.1	6.4
2010	5.7	7.5	7.4	7.5	6	2.8	4	4.8	3.5	6.6	7.4	6.7	5.9
2011	5.6	7.7	6.5	8	5.5	3.7	4.2	4.5	6.2	7.8	8.1	5.1	6.1
2012	4.8	7.6	7.5	6.9	6.7	3.2	4.7	5.3	4.4	6.1	6.4	4.2	5.7
2013	6.5	7.5	8	7.1	4.2	5.2	4.7	3.9	4.7	5.6	8.7	4.7	6
2014	4.9	6.2	8.6	8.1	6.3	3.8	5.4	4.2	5.1	7	7.6	5.1	6.1
2015	5.6	6.3	7.8	5.3	5.8	3.8	2.8	3.2	5.4	6.3	7.7	4.7	5.5
2016	4.5	5.7	6.8	6.8	5.5	5	4	6.1	4.8	6.2	7.4	7.3	5.9
2017	7.5	7.5	5.6	5.5	6.3	3.3	3.5	3.8	3.8	5.9	7.8	6.2	5.6
2018	5.1	6.5	7.5	5.7	4.8	4.4	4.6	4.4	5.2	6.1	7.8	6.6	5.8

Source: BMD;

Figure 16: Monthly average Sunshine Hours/Day (Jan 2009 to Dec 2018)



Source: BMD & PwC Analysis

4.3.3. Air Quality and Noise

4.3.3.1. Air Quality

To establish the baseline of the Proposed Site, ambient air quality monitoring was conducted by Department of Environment (DoE), Sylhet, Bangladesh on 29/01/2020 and 11.02.2020. Ambient air (outdoor) quality of the project has been monitored for the parameters SPM, NO_x and SO_x from northern and Southern side of proposed EZ area. Ambient air quality of the project area is furnished in below table.

Table 15: Ambient Air Quality of Project Area

Sample Location	Date	SPM µg/m ³	NO _x µg/m ³	SO _x µg/m ³
South Side of EZ Site (Proposed)	29.01.2020	163	8	ND
North Side of EZ Site (Proposed)	11.02.2020	131	6	ND
Ambient Air Quality Standards as per ECR-1997 (Ammendment-2005)		200	100	365

Source: Monitoring conducted by DoE, Sylhet;

From the analysis it has been observed that the values of SPM, SO_x, NO_x are within the maximum permissible limit of ECR 97 Schedule 2 (amendment 2005) at both of the sampling locations. However, it was observed that SPM value is little higher at South Side of proposed EZ location. This may be caused due to the movement of plying traffic on Dhaka-Sylhet Highway. Analysis report for ambient air quality is furnished in **Appendix E**.

Also based on the secondary information and the site reconnaissance survey it was observed that baseline air quality was satisfactory and air pollution poses no such threat presently. This may be due to the fact that the project area is located in a rural zone with no such industries in the surrounding area.

Operation in the EZ has not started yet, however, air quality should be monitored regularly during construction and operation phase. Ambient air quality can be monitored at four corner points of the EZ. The latitude and longitude of the points are given below:

Table 16 Air Quality Monitoring points (Construction and operation phase)

Point	Latitude	Longitude
1	24°37'44.76" N	91°39'39.55" E
2	24°37'10.00" N	91°39'46.00" E
3	24°37'49.04" N	91°40'04'49" E
4	24°37'30.04" N	91°40'20.25" E

4.3.3.2. Noise Quality

To establish the baseline condition of noise environment monitoring of noise level was carried out by Department of Environment (DoE), Sylhet, Bangladesh on 29th January 2020 and 11.02.2020 from the project area. On-site Inspection has been done to measure the noise level at the project area. During the time of sampling the project area was divided into 4 imaginary parts (i.e. East, West, North & South) and reading was taken from each of the parts. Finally, the value of 4 parts has been taken into account for interpreting the result. The level of noise found within the limit of Bangladesh Standard (at daytime for Mixed Area) as per Noise pollution (control) rules, 2006 for both the time. Detailed analysis report for ambient noise level is furnished in **Appendix E**.

Table 17: Ambient Noise Quality of Project Area

Lab Code No	Sample Location	Date	Time	Sound Level in (dBa)
373	East Side of the boundary	29.01.2020	10:20 am	57.3
	South Side of the boundary	29.01.2020	10:26 am	58.3
	North Side of the boundary	29.01.2020	10:46 am	49.0
	West Side of the boundary	29.01.2020	10:56 am	49.4
383	North Side of the boundary	11.02.2020	11:20 am	58.2
	South Side of the boundary	11.02.2020	11:28 am	57.3
	East Side of the boundary	11.02.2020	11:36 am	49.5
	West Side of the boundary	11.02.2020	11:47 am	48.4
Bangladesh Standard at daytime for Mixed Area as per Noise pollution (control) rules, 2006		-	6:00 am To 9:00 pm	60.0

Source: Monitoring conducted by DoE, Sylhet;

Operation in the EZ has not started yet, however, noise quality should be monitored regularly during construction and operation phase. Noise quality can be monitored at four corner points of the EZ. The latitude and longitude of the points are given below:

Table 18 Noise Quality monitoring point (Construction and operation)

Point	Latitude	Longitude
-------	----------	-----------

1	24°37'44.76" N	91°39'39.55" E
2	24°37'10.00" N	91°39'46.00" E
3	24°37'49.04" N	91°40.04'49" E
4	24°37'30.04" N	91°40'20.25" E

4.3.3.3. Source of Air Pollution and Noise Generation

No significant noise or air polluting source was identified from proposed site and Proposed Site. The plying traffic from adjoining Sylhet – Dhaka highway likely to cause air pollution to some extent. Construction activities for EZ development may further aggravate the dust levels in the area, thus it is required to undertake all the dust control measures during the construction phase. Similarly, dust control management plan should be prepared for operation phase.

4.3.4. Water Resources

4.3.4.1. Surface Water System & Drainage

Major water body within 10 km Proposed Site are river Kushiya, the water body namely Gong (a large water body to the southern side of the proposed site), River Manu and other Beels and Khals. Kushiya river is perennial river. Average depth of the Gong is 15 feet.

Kushiya River is one of the trans-boundary Rivers of Bangladesh. The Kushiya River originates from India. The Kushiya passes through the Eastern side and it is 1.5 kilometer away from the project site. The flood period is generally from the last week of May to the middle of October. The Kushiya River is approximately 150 m wide when full and the average depth is about 12 m. The slope of the river bed is higher in Kushiya which is 100mm/Km. The principal tributaries of the Kushiya River are the Langai, the Manu, the Juri, the Gopla, the Khowai and the Sutang, all originating from Tripura hills. The river is navigable almost throughout the year although sand bars often create difficulties for smooth navigation. The Manu river, which originates in the Tripura hills and follows a meandering north-westerly course between Rajkandi and Ita hills and along the northern face of Balisira range past Maulvibazar it meets the Kushiya river near Bahadurpur. The Manu has a catchment area of 1000 sq. kilometers. Monsoon floods and flash floods occur in the area. Flash floods occur during April to May in the area. As Manu river is far away from the project site, Flash Flood and Monsoon Floods will not affect the project area.

4.3.4.2. Tropical Cyclones & Tidal flooding

Since the Maulvibazar district is not coastal area so there are no threats of tropical cyclones or tidal flooding in the area.

4.3.4.3. Floods

Floods are the most significant natural hazard in the country causing extensive damage to human life and property. The country lies on the downstream part of three major river basins: Brahmaputra, Ganges and Meghna and thus is frequently flooded. There have been many destructive floods in Bangladesh, including very severe floods of 1987, 1988 and 1998. The 1988 flood set a new record for flooded area, while 1998 flood was unprecedented with its long duration. The flood damage potential in Bangladesh is increasing due to the possible

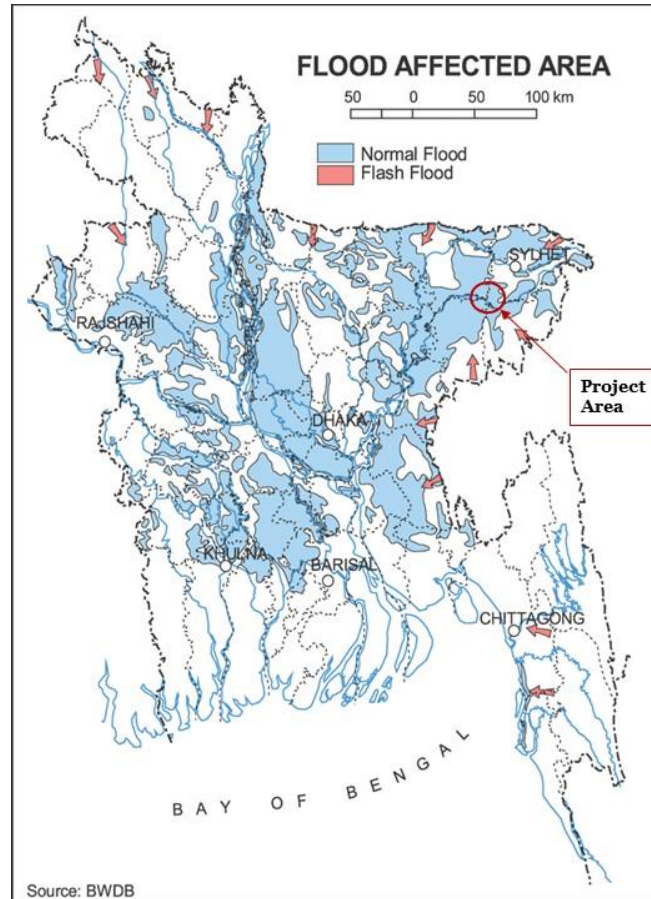
causes of climate change, urban concentration in the three river basins, encroaching of settlements into flood prone areas, and overreliance on the safety provided by flood control works such as levees, reservoirs. There are two types of floods which occur in Bangladesh: annual floods (barsha) that inundate up to 20% of the land area; and low frequency floods of high magnitude that inundate more than 35% of the area (bonna). The major floods that occurred in 1954, 1955, 1974, 1984, 1987, 1988, 1993, 1998, 1999, 2000 and 2007 have been very destructive and caused serious threat to lives and economy.

Major River in the Proposed Site is Kushiya River. Total length of Kushiya River in Bangladesh is 157 kms and has mean depth of 9.7 m at Sherpur. The average highest and lowest discharges recorded by BWDB at Sherpur station are 1913.8 cum/sec & 169.1 cum/sec respectively. River generally floods in rainy season, i.e. middle May to October. Between the River Surma (flowing to the Northern side of Kushiya) and Kushiya, there are many internal draining depressions (haors), meandering flood channels and abandoned river courses, which are widely flooded every monsoon season.

According to Annual Flood report 2018, (FFWC, BWDB), A severe flash flood hit the North-Eastern region of Moulvibazar District due to the Surma-Kushiya rivers and tributaries at the time of onset of monsoon this year during the 2nd-3rd week of June. Among the localised events of this flooding, the flash flood of Manu river was the worst and was the most severe in last 10 years which did considerable damage to embankments, roads and households. The Moulvibazar town as well as some other parts of the district remained inundated for a few days. At Sherpur the river Kushiya first crossed the Danger Level on 11th May to 12th May for 2 days in total during the whole monsoon. It attained its highest peak of 9.06 mPWD⁷ on 11th May which was 6 cm above its DL (9.00 m).

Figure 17: Flood Prone Area Map

⁷ 'PWD is a horizontal datum believed originally to have zero at a determined Mean Sea Level (MSL) at Calcutta. PWD is located approx. 1.5 ft below the MSL established in India under the British Rule and brought to Bangladesh during the Great Trigonometric Survey'-FFWC



Source: BWDB

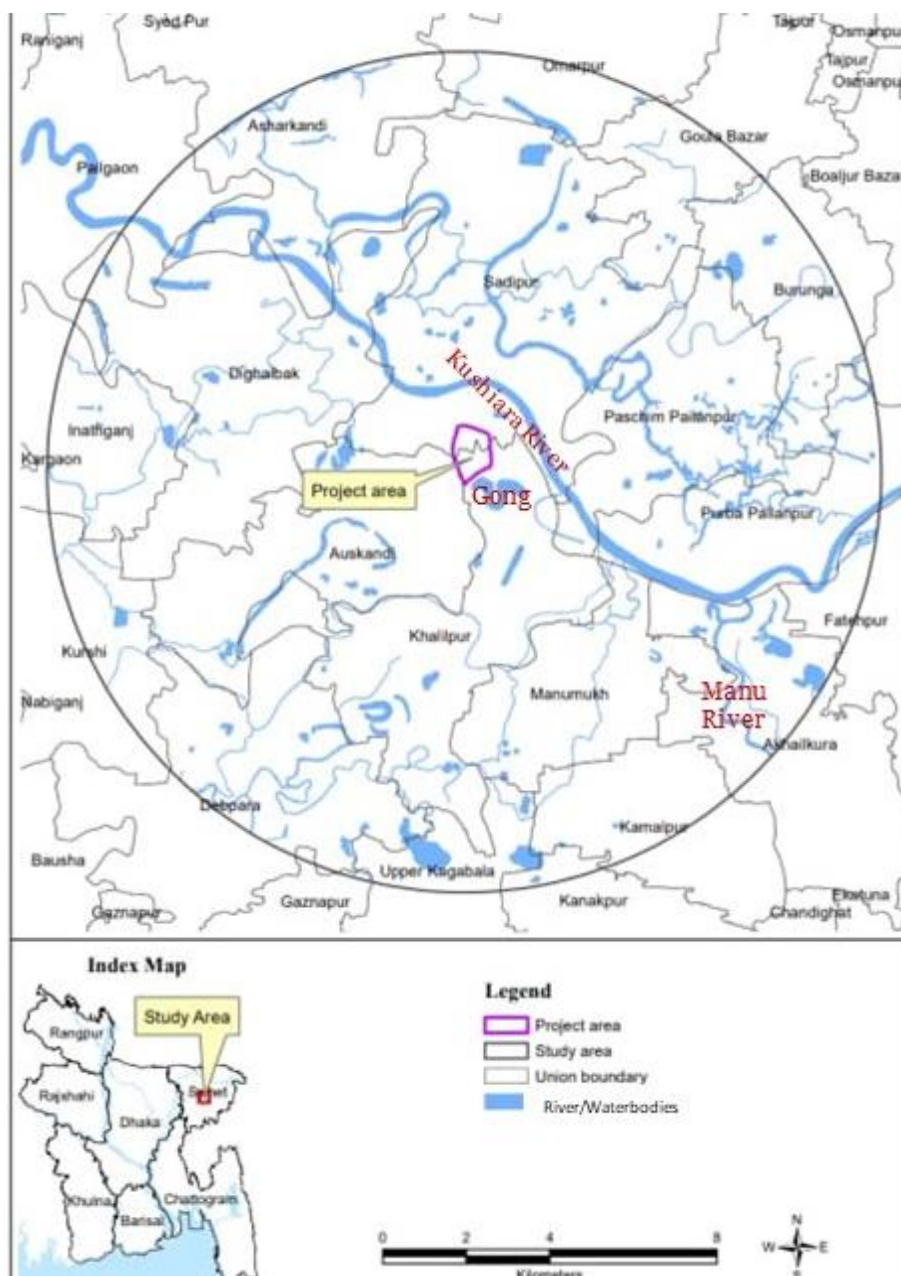
4.3.4.4. Salinity

River water & ground water in the Proposed Site is fresh and TDS is found to be in limits as per standards given in ECR, 1997.

4.3.4.5. Drainage Congestion and Water Logging

Proposed Site is drained by Kushiya River through various streams, khals, Beels and streams. Gong, a water body located southern side of proposed site is water logged area which receives the storm water from nearby locations. Proposed Site drains finally into River Kushiya through a khal meeting Kushiya River at app. 5 kms distance from EZ site in North Direction. Drainage map of the project area various water logged areas, waterbodies is furnished in below figure.

Figure 18: Drainage Map of Project Area

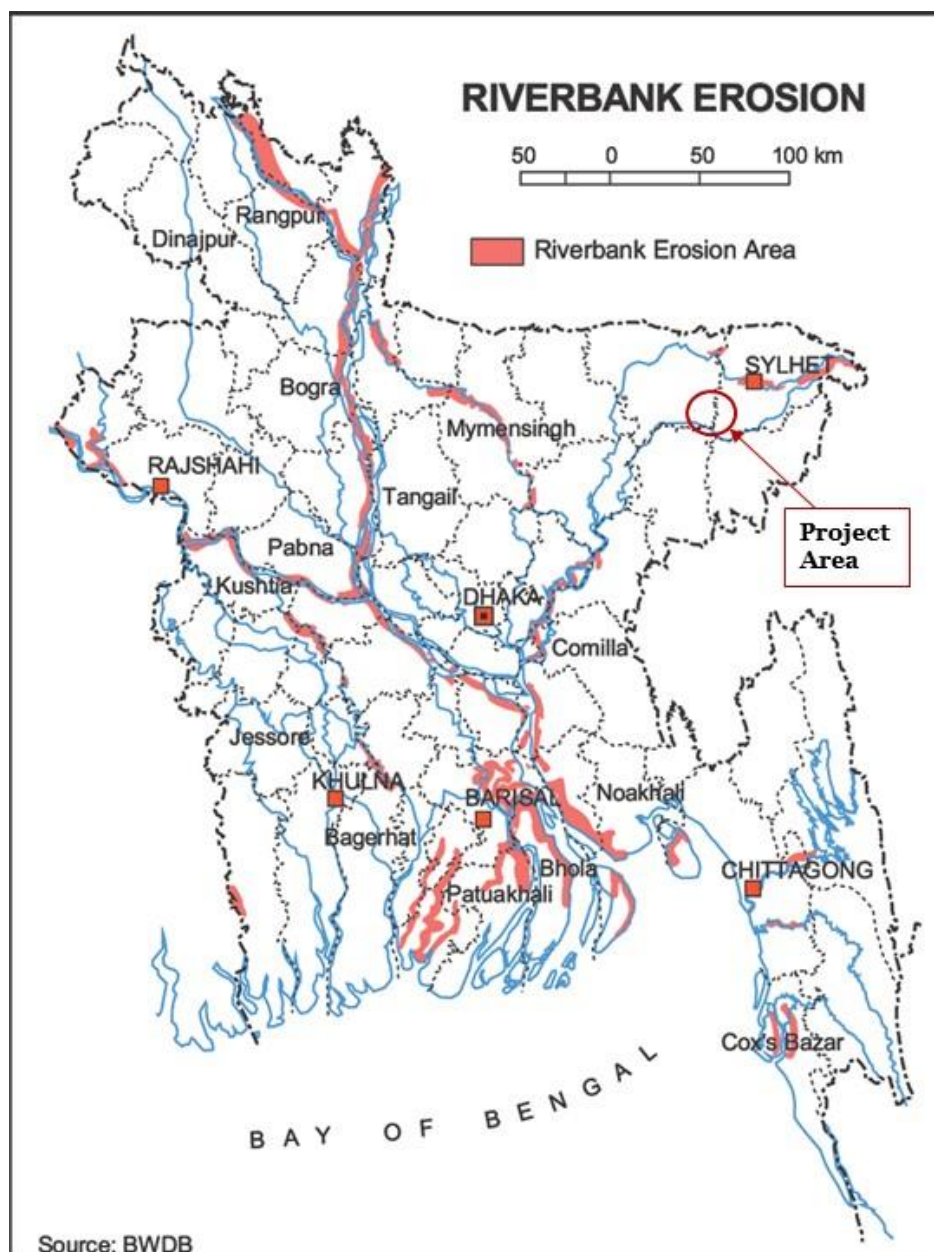


Source: Google earth; PwC analysis

4.3.4.6. Erosion and Sedimentation

Kushiara and Monu River can be characterized mainly as meandering river within a well defined high water level. Flash flood occurs at the upper reach of Kushiara River. Monu River shows flashy characteristics for entire of its length. River carries heavy flow during the monsoon season and heavy sediment load. Due to which erosion of the bank and deposition of the sediments on the bank is being regular phenomenon in these rivers. River bank erosion is one of the major problems faced by local people. River Bank Erosion Map of Bangladesh showing the project area is provided in below figure.

Figure 19: River Bank Erosion Map



4.3.4.7. River Morphology

Proposed EZ is located nearly 1.5 km to 2 km towards the south side of river Kushiya. Kushiya River is one of the trans-boundary Rivers of Bangladesh. The Kushiya River originates from India. It forms on the India–Bangladesh border as a branch of the Barak River, when the Barak separates into the Kushiya and Surma. The waters of the Kushiya thus originate in the state of Nagaland in India and pick up tributaries from Manipur, Mizoram and Assam.

During monsoon for the period the maximum level of water in the river have been found as 9.67m. The water level has also been studied on the basis of recorded Highest & Lowest Water Level data collected over the periods 1985 to 2016 at the gauge downstream of Sherpur of Kushiya River.

Table 19: Water Level of Kushiya River

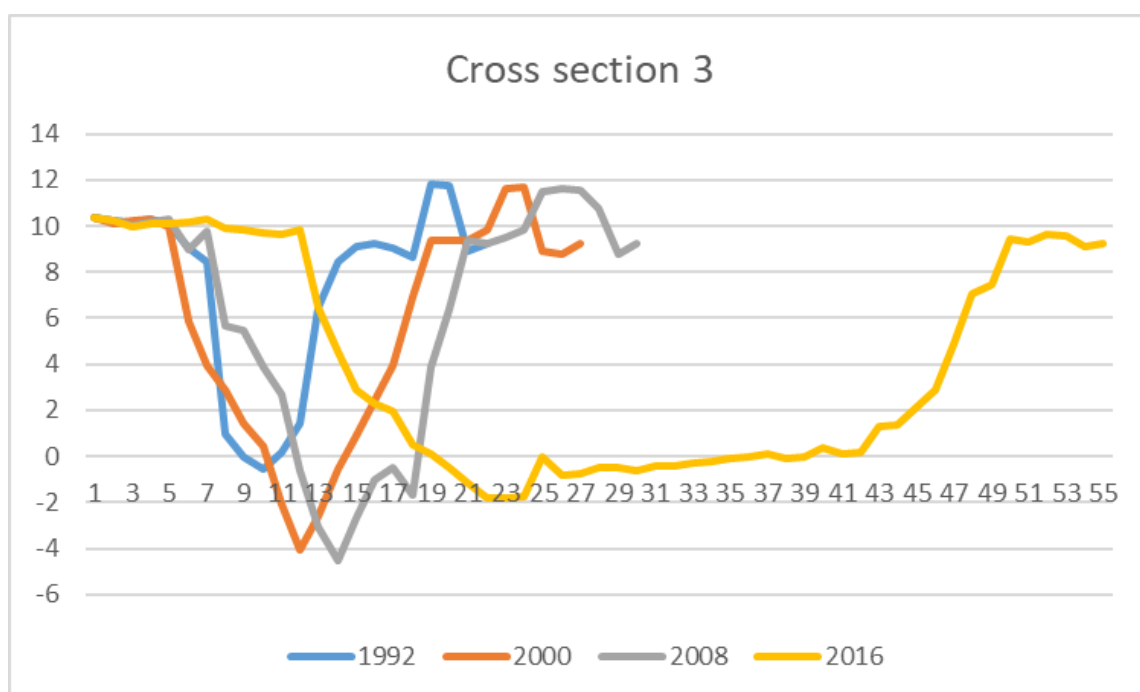
District	River name	Station ID	Station name	RHWL	Date time	RLWL	Date time
Maulavibazar	Surma-Kushiyara	SW175.5	Sherpur	9.67	21/7/2004	2.02	27/3/1995

RHWL= Recorded highest water level; RLWL= Recorded lowest water level

Source: BWDB

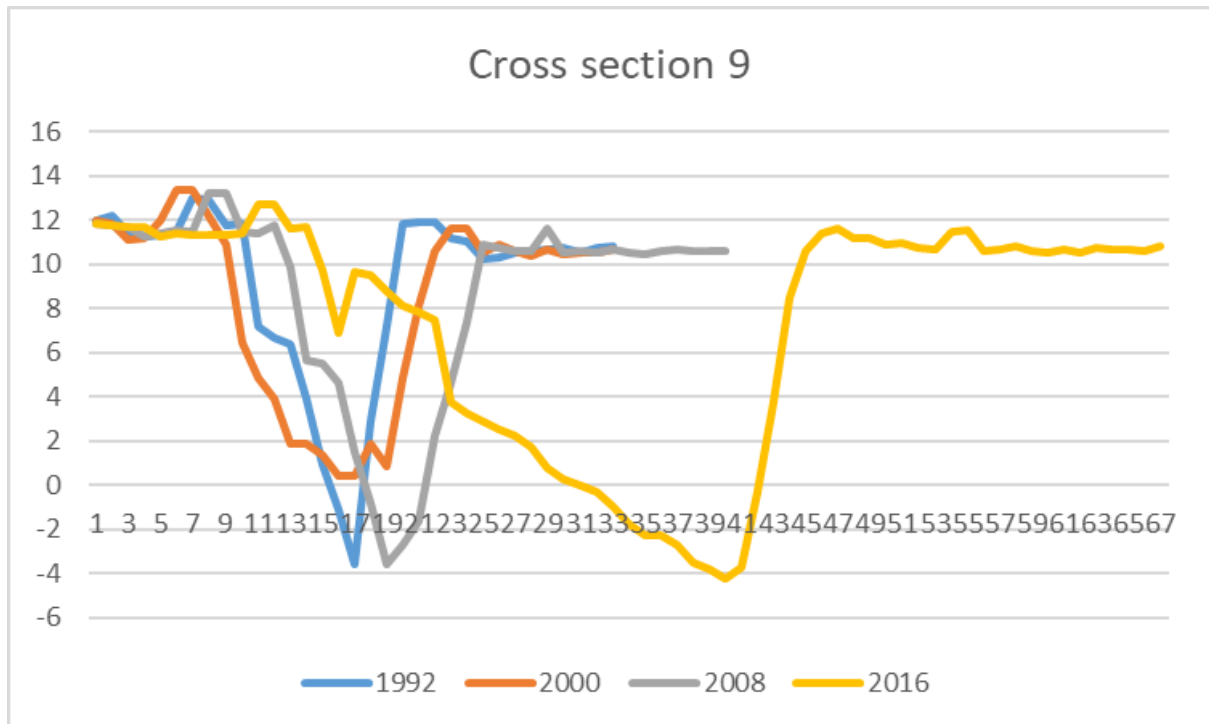
4.3.4.7.1. River cross section changing⁸

Changes in cross section over time can be understood from the graphical representations. Cross section 3 indicates that the depth of this section increased with time and it widened significantly in 2016.

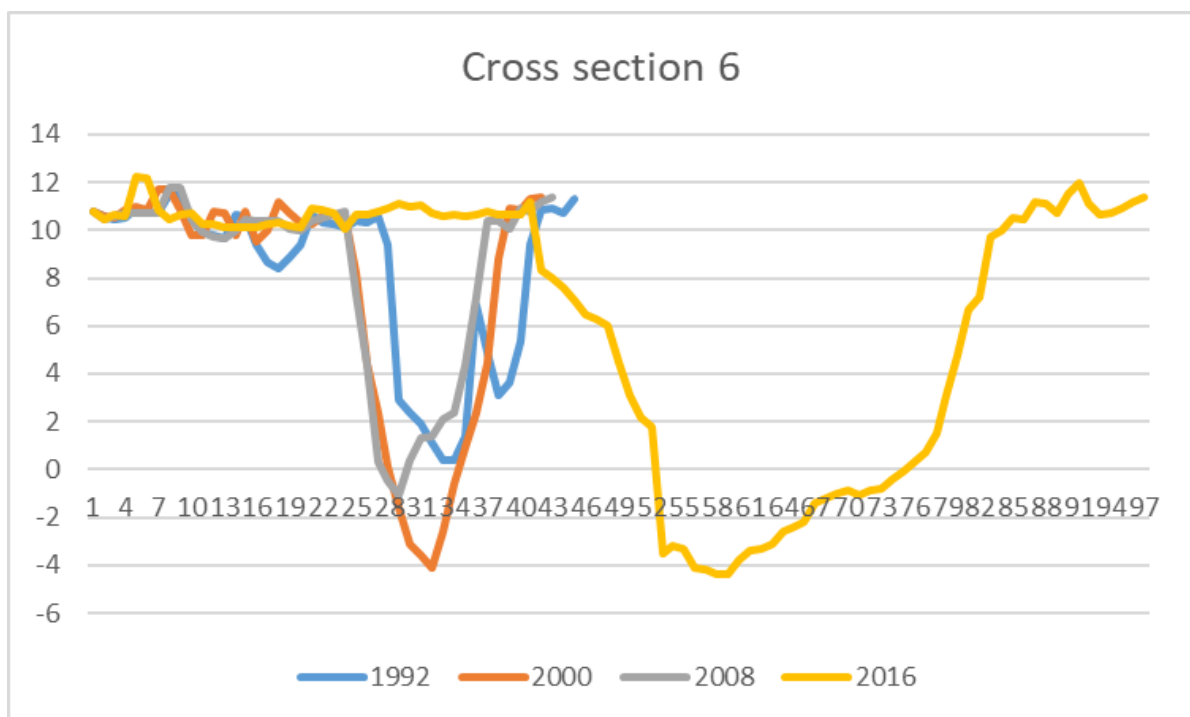


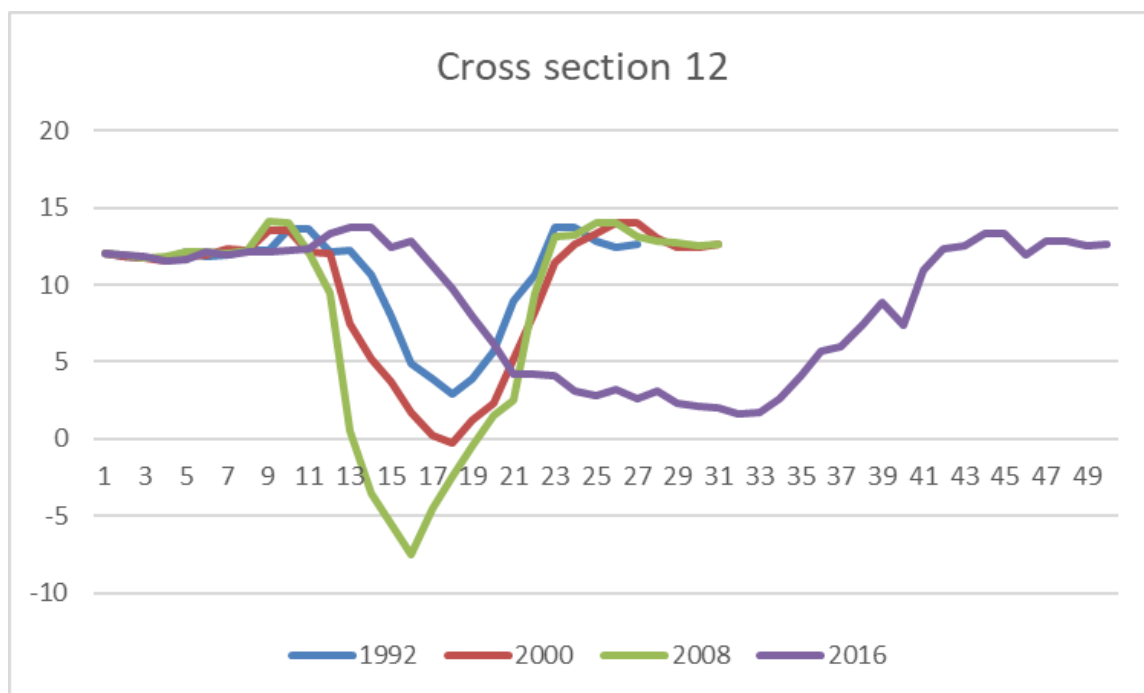
The depth of cross section 9 reduced from 1992 to 2000 and again increased afterwards. Major shifting of this section is visible in 2016.

⁸ BWDB (1992, 2000, 2008, 2016) & PwC Analysis



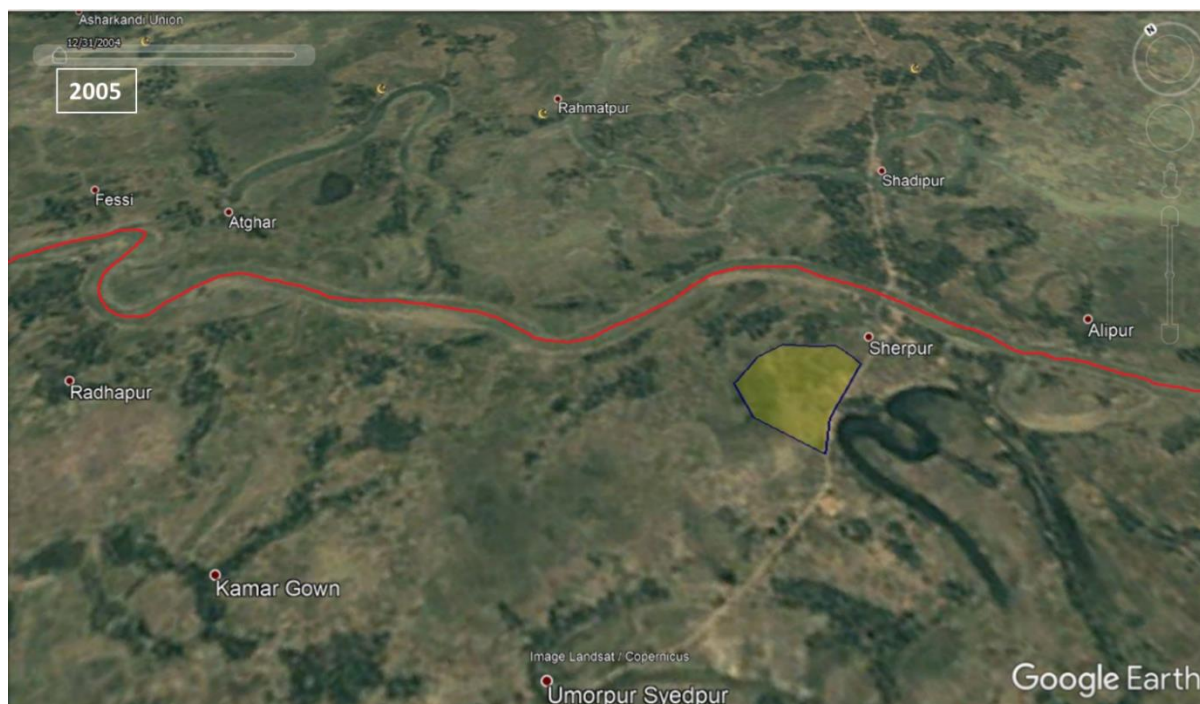
In case of cross section 6, the depth had a gradual increment over time and a major shifting like other cross sections can be identified in 2016. Similar scenario is observed in case of cross section 12.





4.3.4.7.2. River course shifting

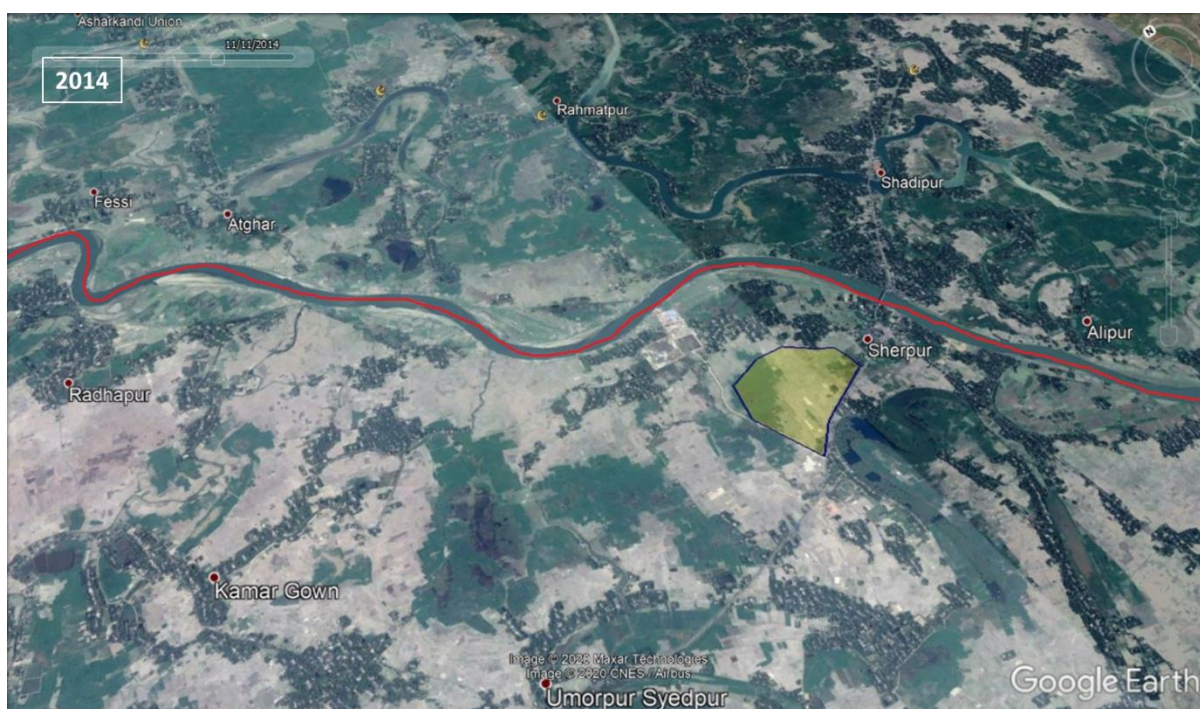
Historical satellite image shows little changes and evolutions of riverbanks and main stream since 2000-2005 with shorter time intervals has been elaborated in the below maps.



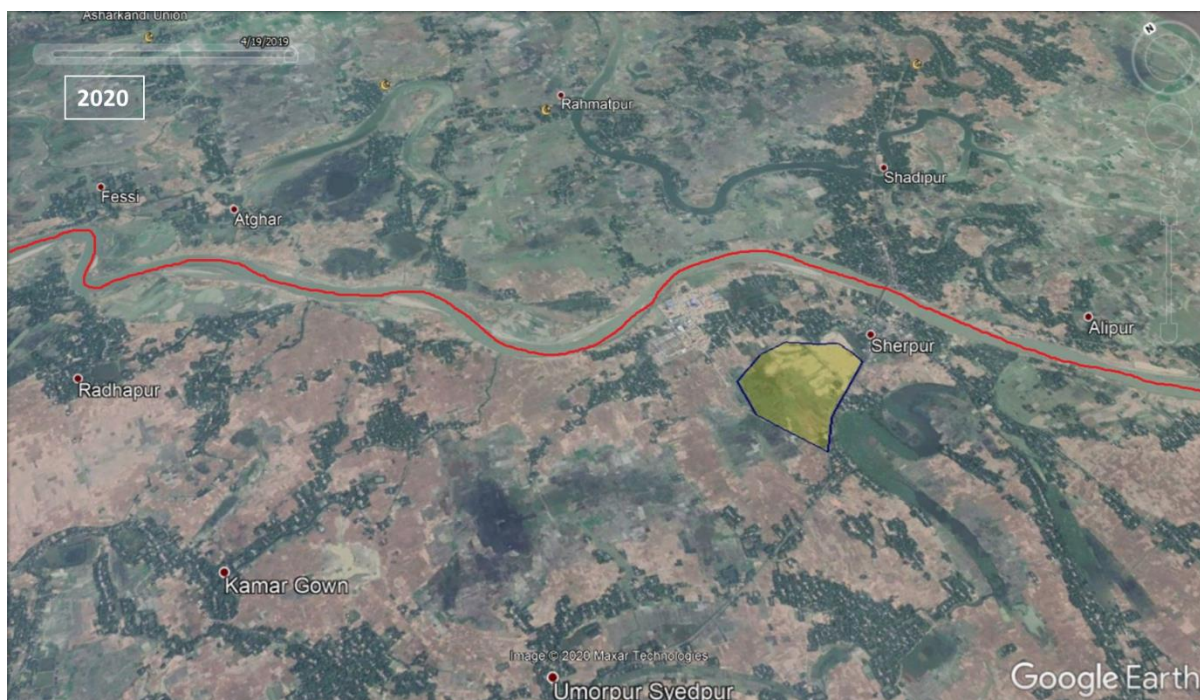
Since 2000-2005, the Kushiyara River near to the proposed site has maintained a single channel section with no char land. It is noted that the river width is within the range from 0.25 km to 1.0 km.



Since 2005-2009, the River has maintained the same channel section with a little widening with course of time.



In 2009- 2014, the river did not show any significant shifting but its width contracted to some extent.



In 2014-2020, the river has developed notable sedimentation and as a result its width has decreased significantly.

4.3.4.8. Navigation

The closest navigable river to Shreehatta EZ is the Kushiya River, located at about 800 m from the proposed EZ. Water flow is high during rainy season and low in dry season. The average depth of the river is 10 m. Launches, cargoes, trawlers and all other kinds of boats are plied during wet seasons through Kushiya River. So, it is possible to transport heavy equipments through this river system. Also aids for navigation during the night are not available for Kushiya River. Ashuganj River Terminal on Meghna River it is about 108 Km from the proposed EZ by road. Ashuganj River terminal is connected through Dhaka Sylhet Highway to the project site.

4.3.4.9. Surface Water Quality

Surface water samples from 2 water bodies located within Proposed Site of proposed EZ has been drawn by Department of Environment, Govt. of Bangladesh in the month of January'2020 for testing to have an understanding about the surface water quality of the project area. Sampling of surface water samples has been conducted by following grab sampling method towards analyzing various physico-chemical parameters.

The analysed result for various surface water quality parameters are furnished in below table along with reference test methods.

Table 20: Surface Water Quality of Project Area

Sample Location:	Pond at Parkul, 5 No-Aushkandi, Nobigonj, Hobigonj	Beribil Ghat, Sherpur	
Date:	29.01.2020	11.02.2020	
Parameters	Recorded Value		Bangladesh Standard for Inland Surface Water as per ECR-1997
Temp. °C	23.2	22.8	-
pH	7.2	6.6	6.0-9.0
BOD mg/l	4	3	50
COD mg/l	11	9	200
EC µS/cm	141.4	81	1200
TDS mg/l	60	43	2100
TC mg/l	0.03	0.04	0.05
SSmg/l	41	10	150
Chromium mg/l	0.04	0.03	0.05
Turbidity (NTU)	21	14	N/A
Lead (Pb) mg/l	ND	ND	0.05
Chloride mg/l	0.5	0.4	150-600
Alkalinity mg/l	15	13	200-500
Iron mg/l	0.15	0.12	0.3-1.0
Sulphate mg/l	5	3	400
Total Hardness mg/l	0.15	0.12	200-500
Fluoride	ND	ND	1
Ammonia	0.07	0.08	0.5
Oil & Grease	ND	ND	0.01

ND: Not Detected

Source: Monitoring conducted by DoE, Sylhet;

From the analysis, it has been observed that the value of pH, Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Electrical Conductivity (EC), Total Dissolved Solid (TDS), Total Carbon (TC), Suspended Solid (SS), Lead (Pb), Chloride, Alkalinity, Iron, Sulphate, Total Hardness, Fluoride, Ammonia and Oil & Grease C & Biochemical Oxygen Demand (BOD₅) is within the allowable limit of ECR 97. Detailed analysis report for surface water quality is furnished in **Appendix E**.

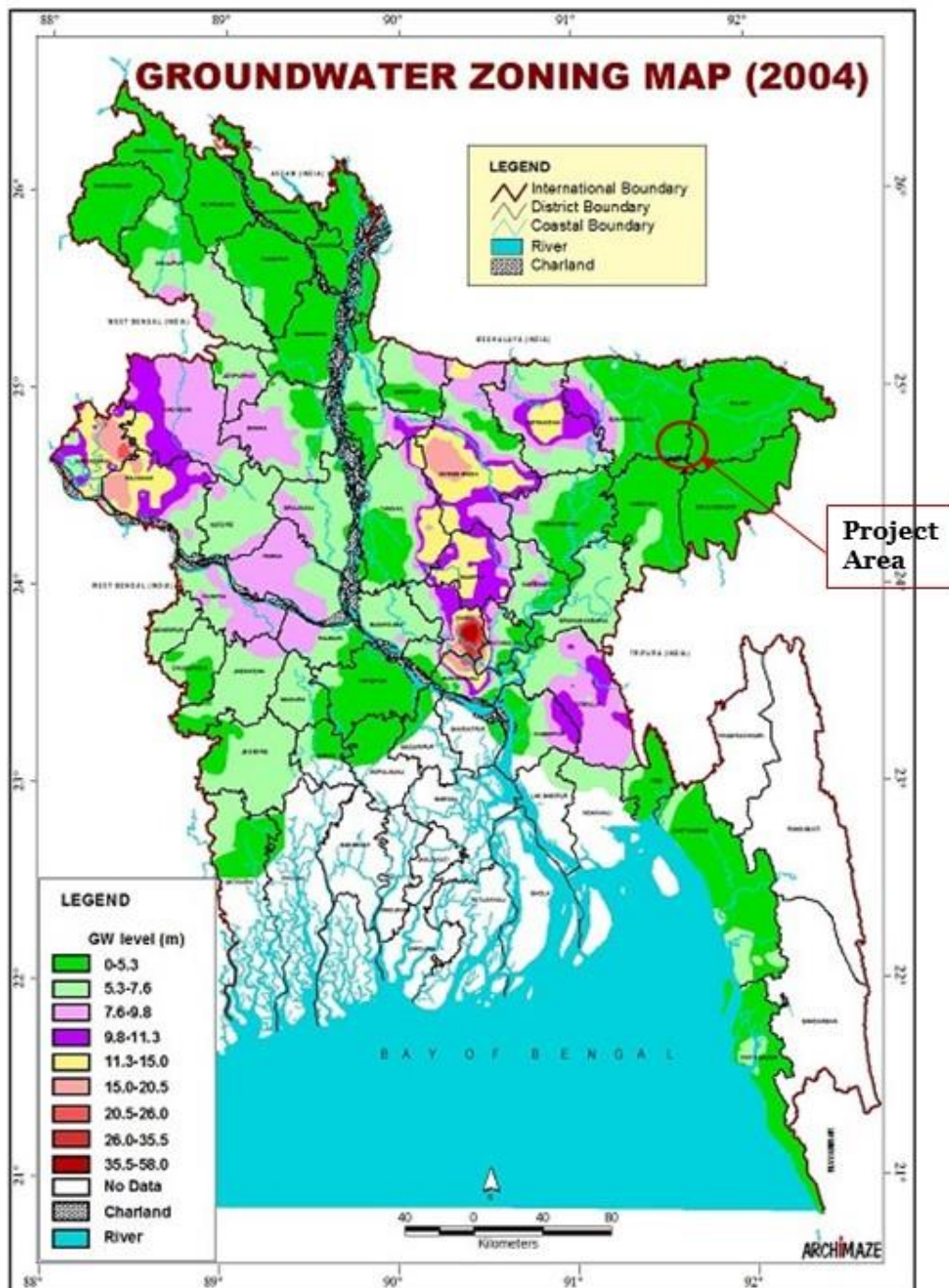
4.3.4.10. Ground Water system

Project site lies Surma Basin. Soils of the region are grey silty soils on the ridges and clayey in the basins. Aquifers of the region are confined and semi-confined (Md. Munir Hussain & S.K.M. Addullah, 2001).

Depth of the ground water in the area varies from 4-5 mbgl during dry season. Due to the nature of strata area has very high potential for ground water recharge. Potential recharge varies from 1001-2500 mm. Ground water zone map of Bangladesh is given below figure.

According Ground Water Zoning Map, the water level lies between 0-5.3 m below from ground level.

Figure 20: Ground water Zoning Map of Bangladesh



Source: <http://www.badc.gov.bd/site/page/821c0395-1a32-42bb-8666-fbc4819e83cb/Zoning-map>

4.3.4.11. Ground Water Quality

Ground water sample from Tubewell located in the vicinity of proposed EZ area has been drawn by Department of Environment, Govt. of Bangladesh in the month of January'2020 for testing to have an understanding about the ground water quality of the project area. Sampling

of ground water has been conducted by following grab sampling method towards analyzing various physico-chemical parameters.

Table 21: Ground Water Quality of Project Area

Sample Location:	Tubewell at Sherpur	Tubewell at Parkul, 5 No Aushkandi	
Date:	29.01.2020	11.02.2020	
Parameters	Recorded Value		Bangladesh Standard for Inland Surface Water as per ECR-1997
Temperature °C	24.9	24.3	20-30
pH	7.08	7.07	6.5 – 8.5
BOD (mg/l)	0.4	0.5	0.2
COD (mg/l)	4	3	4
TDS (mg/l)	60	56	1000
EC µS/cm	445	457	1200
Alkalinity	16	18	10-500
TSS (mg/l)	8	7	10
Turbidity (NTU)	4	5	10
Chloride (mg/l)	5	4	150-600
Iron (mg/l)	0.14	0.12	0.3 – 1.0
Total Hardness (mg/l)	15	14	200-500
Coliform /100ml	0	0	0

Source: Monitoring conducted by DoE, Sylhet;

From the analysis, it has been observed that apart from BOD, all the parameters like Temperature °C, pH, COD (mg/l), TDS (mg/l), EC µS/cm, Alkalinity, TSS (mg/l), Turbidity (NTU), Chloride (mg/l), Iron (mg/l), Total Hardness (mg/l), Coliform /100ml are well within the allowable limit of ECR 97. Detailed analysis report for surface water quality is furnished in **Appendix E**.

No pollution generating source has been identified. Online water quality monitoring system for the inlet and outlet of ETP during operations phase of the project.

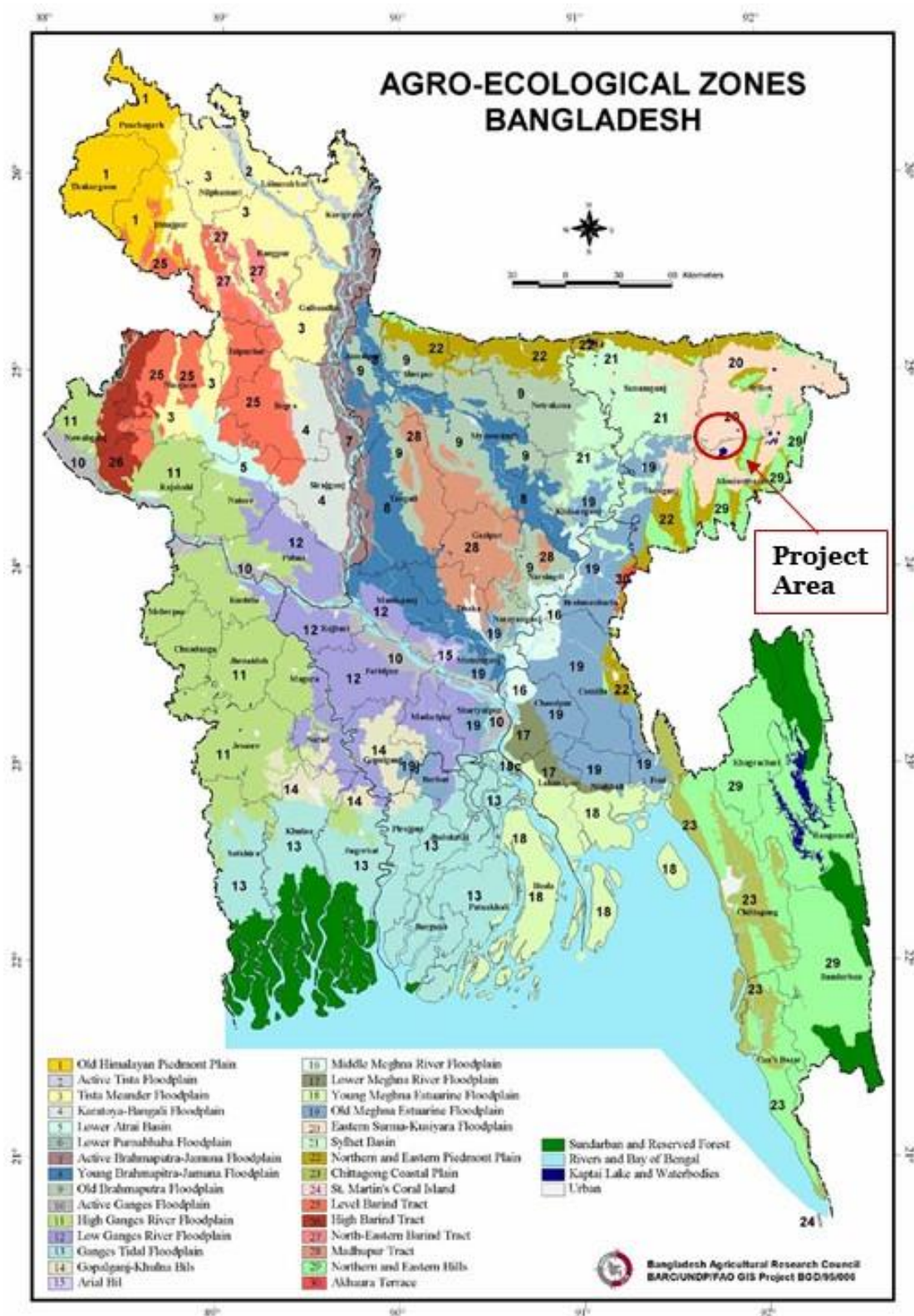
4.3.5. Land Resources

4.3.5.1. Agro Ecological Regions

An Agroecological Region is a zone which has unique combination of physiographic, soil, hydrological and agroclimatic characteristics. Thirty agroecological regions and 88 subregions and 535 units have been identified by adding successive layers of information on the physical environment which are relevant for land use and for accessing agricultural potential. These layers are: Physiography, Soils, Depth and duration of seasonal flooding, Length of rainfed kharif and rabi growing periods, Length of pre-kharif period of unreliable rainfall, Length of cool winter period, Frequency of occurrence of extremely high (>40 degrees) summer temperature.

Agro-ecological zones map of Bangladesh is furnished in below figure. The Proposed Site falls under Agro Ecological Zone 20 i.e. under Eastern Surma Kushiya Flood Plains. This area is occupied by grey, heavy silty clay loams on the ridges and clays in the basins. It occupies mainly smooth, broad, ridges and basins, with 3-6 m local differences in elevation. Organic matter content of the soil is moderate. Soil reaction ranges from strongly acidic to neutral.

Figure 21: Agro-ecological Zone of Bangladesh



4.3.5.2. Land Types

Land types are classified depending upon the depth of inundation during monsoon season due to normal flooding in an average year. Soil Research Development Institute (SRDI) has made the land type classification into five types, i.e. High land (Above flood level), Medium highland

(Flooding depth 0-90 cm), Medium lowland (Flooding depth 90-180 cm), Lowland (Flooding depth 90-270 cm) and very lowland (Flooding depth >270 cm). Land type classification based on flooding during Monson Season by SRDI is given in below table.

Table 22: Land Type Classification

Land Type	Description	Flooding Depth	Flooding Characteristics
F0	Highland	0-30 cm above flood level	Non flooded to intermittent
F1	Medium Highland	flooding depth 30-90 cm	Seasonal
F2	Medium Lowland	flooding depth 90-180 cm	Seasonal
F3	Lowland	flooding depth 180-270 cm	Seasonal, but remains wet in early dry season
F4	Very Lowland	flooding depth > 270 cm	Seasonal but remains wet in most of the dry season

Source: SRDI

The land type characteristics are almost uniform within the Proposed Sites. The cultivable land falls in two classes, such as (i) medium lowland where maximum flooding depth is below 180 cm and (ii) low land where maximum flooding depth is below 270 cm during the monsoon period. Proposed site for the EZ site falls in medium low land area.

4.3.5.3. Seismicity

Bangladesh is very vulnerable to potential earthquake threat and damage. Earthquake vulnerability of any place largely depends on its geology and topography, population density, building density and quality, and finally the coping strategy of its people and it shows clear spatial variations. Bangladesh has been divided into three seismic zones. Bangladesh has been divided into three generalized seismic zones. The northeastern regions of Bangladesh are the most active zones and belong to the zone-I. The zone II consists of the regions of recent uplifted Pleistocene blocks and considered as moderately active. The southwest Bangladesh is seismically quiet zone and represented by zone III. Proposed site is located in Zone I.

In the earthquake zoning map 26 percent of Bangladesh falls in high risk, 38 percent moderate and 36 percent in low risk zone in terms of earthquake vulnerability. The distribution of recorded earthquakes indicate a major clustering of seismicity around the Dauki Fault and scattering of other events along other major fault systems of Bangladesh. The magnitude of the earthquakes are moderate (4-6) and majority of them are shallow depth. The north-eastern part of Bangladesh is in the most active seismic zone and has experienced earthquakes of moderate to high intensity. The great earthquake of 1897, which had its epicenter in Shilong Plateau in India, caused widespread damage. Two major earthquakes-the Bengal earthquake of 1885 and Sreemangal earthquakes with magnitudes between 7.0 and 8.7 on the Richter scale have been experienced.

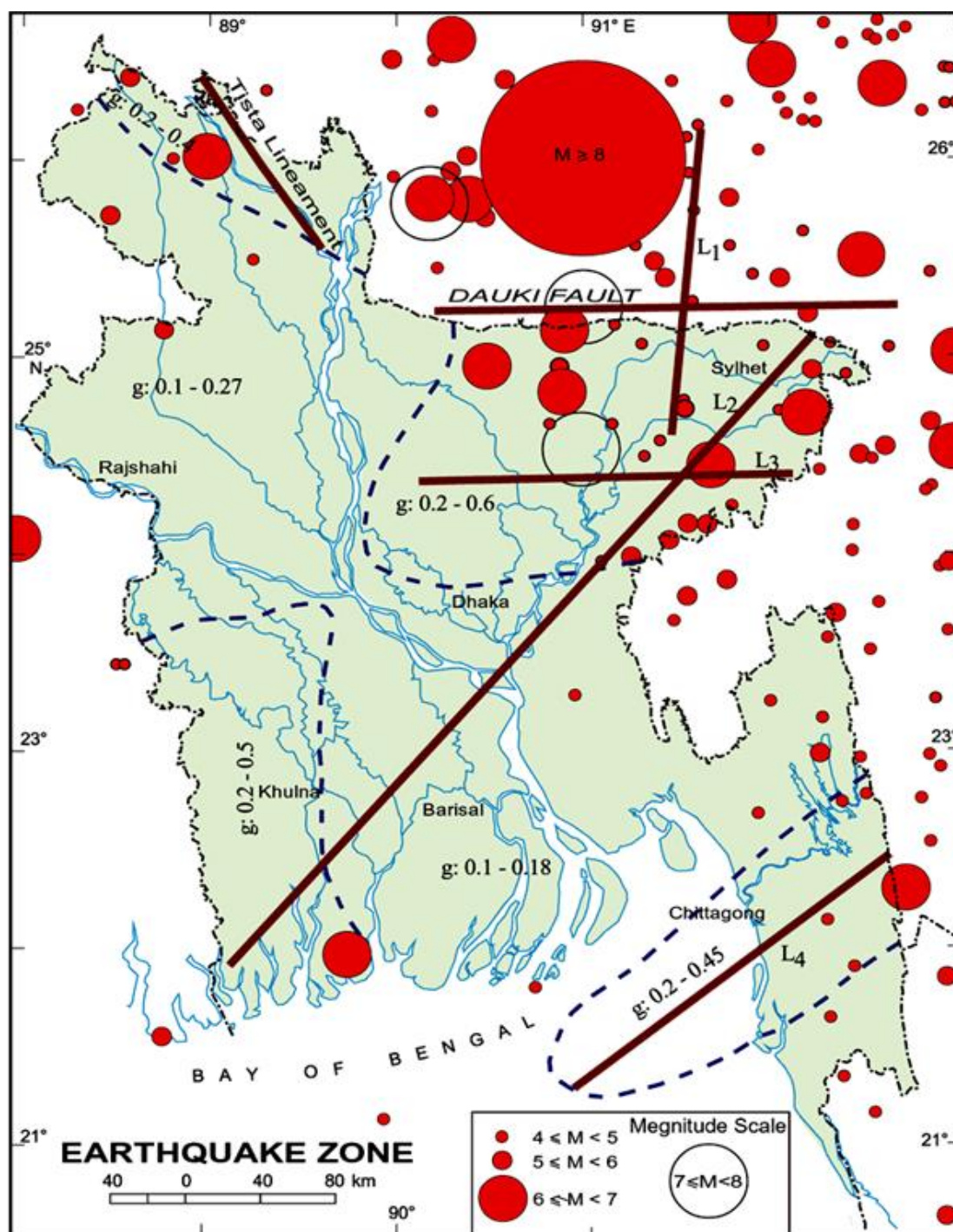
Seismic zoning map of Bangladesh is given in following figure.

Figure 22: Seismic zone map of Bangladesh



Source: Selected readings: Disaster Research Training and Management Centre, University of Dhaka, 2001

Figure 23: Seismic Activity of Bangladesh



Source: Bangladesh Disaster Knowledge Network

4.3.5.4. Soil Texture

The Project Proposed Site is covered under predominantly agricultural land use. The project area falls in Eastern Surma-Kushiyara Flood Plain which is occupied by grey, heavy silty clay loams on the ridges and clays in the basins. It occupies mainly smooth, broad, ridges and basins, with 3-6 m local differences in elevation. Organic matter content of the soil is moderate. Soil reaction ranges from strongly acidic to neutral.

The topsoil at the EZ site is mainly silty clay. According to the sub-soil investigation record of this area (Maulvibazar District, Sylhet Division) the soil profile at shallow/beyond shallow

depth is mainly dominated by non-cohesive soil. However, for better understanding a field soil bore log data of a bridge site (bore hole location on the land) in Maulvibazar district is presented here. As per the soil profile study, it is observed that upto depth of 5 feet soil is redish fine sandy silt. Beyond 5 feet upto 40 feet, soil is clay soil. At 45 feet, soil is clay plasticity soil. At 50 feet, soil is grey sandy soil. At 55 feet, 60 feet and 65 feet, the soil is grey fine sand. At 70 feet, soil; type is grey medium sand. Soil investigation report is given in figure below.

Figure 24: Sub soil profile of the project area

FIELD DATA RECORDING SHEET						
(SPT & UNDISTURBED SAMPLING INFORMATION)						
Bore-Hole No. <u>02 (T20)</u>		<u>Cont. S. 90. 0m bridge over Dhal River on</u>				
Scheme <u>Chomugach</u>		Location <u>near to Chaitanyan Rd</u>				
Boring Started On: <u>15-1-2011</u>		Boring Completed On: <u>16-1-2011</u>				
Soil Testing Firm / Organisation:						
Depth of Water Table: <u>0'-6" down</u> from <u>water table</u> (determined on the)						
Depth of Soil Surface: <u>12'-0" down</u> from <u>and abutment surface level</u>						
Undisturbed Sample No. & Depth	Depth (ft) from Soil Surface	Penetration Data			PT (N)	Soil Type
		6in.	6in.	6in.		Depth (ft) from Level
	5'	3	4	4	3	redish fine sandy silt
	10'	1	1	1	2	clay soil plasticity
	15'	0	1	1	2	clay soil plasticity
	20'	0	1	1	2	clay soil
	25'	1	1	2	3	clay soil
	30'	1	2	2	4	clay soil
	35'	1	2	3	5	clay soil
	40'	1	2	2	4	clay soil
	45'	2	3	3	6	clay plasticity soil
	50'	4	4	5	9	grey sandy soil
	55'	8	16	25	41	grey fine sand
	60'	18	20	28	48	grey fine sand
	65'	24	30	32	62	grey fine sand
	70'	26	30	35	65	grey medium sand

Source: Feasibility Study Report; Sherpur EZ

4.3.5.5. Land Use

The existing land use pattern of the proposed site of DBL Industrial Park and its surrounding area covering 10 Km radius is presented in the figure below. The land use of Proposed Site covering 10Km radius of EZ site is predominantly agricultural (73.48%) followed by Rural Settlement (19.78%), Water Bodies (6.38%), Urban Areas (0.18%). Major water body within 10 km Proposed Site are river Kushiara, the water body namely Gong (a large water body to the southern side of the proposed site), River Manu and other Beels and Khals.

Figure 25: Land use pattern of the proposed site and Proposed Site



Legend

	Project area		Landuse		Urban Area
	Study area		Agricultural		Waterbodies
	Union boundary		Rural Settlement		Other



Source: PwC Analysis

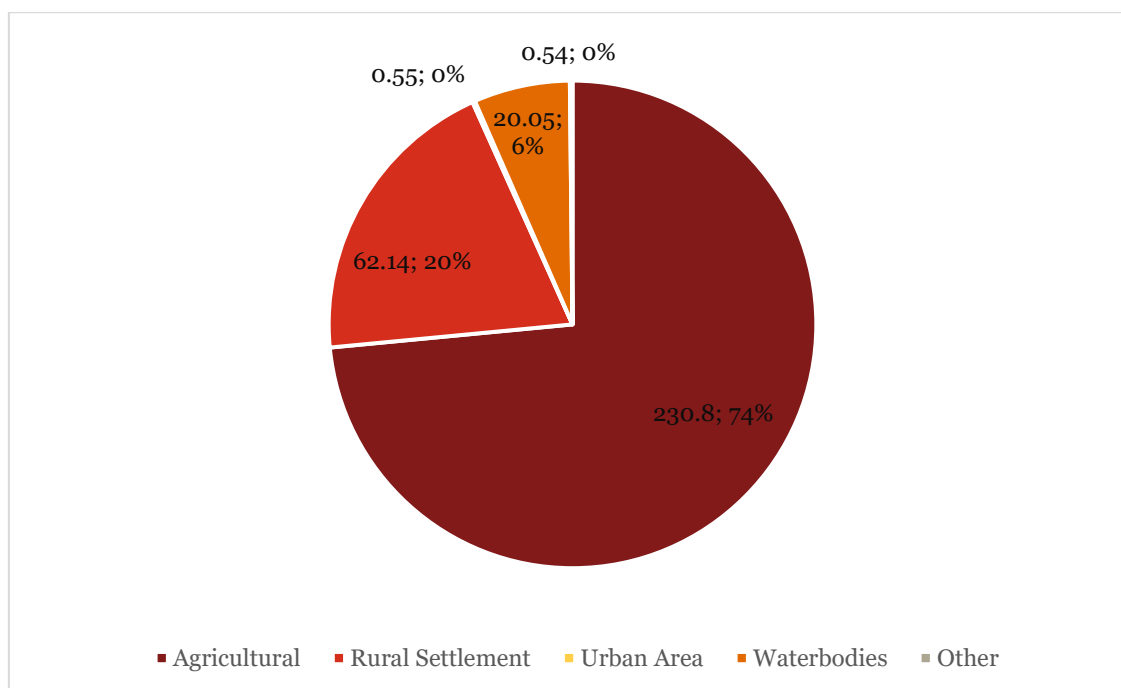
Land use area break up of 10 km Proposed Site is given in table below.

Table 23: Break up for Land use Pattern of Proposed Site

Land Use Land Cover Class	Area (Sq. km)	Area Percentage (%)
Agricultural	230.80	73.48
Rural Settlement	62.14	19.78
Urban Area	0.55	0.18
Waterbodies	20.05	6.38
Other	0.54	0.17
Total	314.08	100 %

Source: PwC Analysis

Figure 26: Break up for Land use Pattern of Proposed Site



Source: PwC Analysis

4.3.6. Agricultural Resource

4.3.6.1. Farming Practice

Agriculture

Presently the proposed area is not used for any agricultural purposes. The land is completely devoid of vegetation or crop after acquired by BEZA. However, in the Moulvibazar Sadar Upazila's farmers practice agricultural activity in this region for 3 seasons, i.e. Rabi, Kharif I and Kharif II. Source of irrigation in this region are river and beel/cannel, ponds, ground water, khals/canal etc. Major crops of the region are paddy, tea, mustard, patol (heap), brinjal, ginger, cucumber and other vegetables.

Aquaculture:

The proposed area is not used for aquaculture. However, fishing is practised in the region in the river, canal, khals & ponds in the Proposed Site.

4.3.6.2. Cropping Pattern and Intensity

10 km radius in the project area main cropping pattern of the Proposed Site is Fallow - T Aman - Boro. This cropping pattern covers Proposed Site majorly. Another cropping pattern is T Aus - T Aman – Fallow. In Kharif-I season T. Aus (HYV) is grown in the Proposed Site. Aus like BR-28, BR-29 are practiced in most of the lands. As informed by Upazila Agriculture Office, there are three cropping seasons, i.e. Kharif-I, Kharif-II and Rabi. Main crops of this region are rice, tea, naga chilli, satkora and vegetables. Major fruits include jack fruit, mango, lichi, banana, coconut, betel nut, black plum, star fruit, lemon, etc. One of the top cash crops, jute, is on the verge of extinction. Major agriculture pattern in Proposed Site is Aman Rice, local vegetables, fruits, Aus Rice and Boro Rice. Major crops of each cropping season are given in table below.

Table 24: Cropping Seasons in Area

S. No.	Cropping Season	Major Crops	Months
1	Kharif- I	Local T Aman, Jute & HYV T. Aus	March to June
2	Kharif - II	Local T Aman, Jute & HYV T. Aman	June to October
3	Rabi Season	Robi Vegetables (Boro rice, potato and others)	November to February

Source: Upazila Agriculture Office and local farmers

4.3.6.3. Cropped Area & Production

As per the land use land cover study of 10 km radius of the project site, approx. 73.48% of the area is covered under agriculture land. Presently the proposed area is not used for any agricultural purposes after land acquired by BEZA. According to Upazila Agriculture Office, Moulvibazar sadar Upazilla has a cultivable crooped land area of 25,100 ha and fallow land area is 14,350 ha.

Table 25: Classification of land in Moulvibazar Sadar Upazila

Classification of lands	Area (Ha)	% amount of total land
High land	2,186	9.45%
Medium high land	10,579	47.18%
Medium low land	4,332	19.32%
Low land	5,326	23.75%
Total land	25,100	

Source: Upazila Agriculture Office

Table 26: Distribution of crop land in Area

Types of crop land	Area (Ha)	% amount of total land
One-crop land	6,615	33.45%
Two-crop land	13,980	61.72%
Three-crop land	1,725	4.83%
Total crop land	39,785	
Net crop land	22,320	

Source: Upazila Agriculture Office

4.3.6.4. Crop Damage and Constraints of Crop Production

No agricultural land is present within proposed EZ boundary. Farmers of Moulvibazar district produce food crops, fruits, vegetables, livestock and poultry, fish, timber, cane and fuel wood. Majority of household also have poultry, livestock and produce poultry and livestock produce for daily consumption and selling.

Major constraints of agriculture in the Proposed Site is availability of arable land, crop damage, seasonal flash flood, water logging, and availability of high-quality seeds and fertilizers. Crop damage is reported to occur due to both excess and flash flood also rainfall. Key obstacles in extension of farming are Inadequate irrigation management; Reluctance in the cultivation of Aus rice and corn; Problems in corn processing and marketing; Problems in collection of Aus rice after cutting due to excessive rainfall; Irregular production of Kharif 1 and 2 vegetables due to heavy rainfall.

As informed by concerned stakeholders, the ways to transform fallow lands into cultivable land are

- Expansion of improved varieties of Aus rice through exhibition
- Inclusion of farmers in Aus cultivation through seed subsidy and crop diversification programs
- Inspiring farmers to cultivate Aus, corn, mustard, sunflower, etc. through field day and trainings
- Increasing depth of natural sources of water like haor, canals, rivers, etc. to solve water logging and irrigation problem
- Introducing drip irrigation
- Encouraging establishment of fruit gardens
- Increasing use of green fertilizers and improving water contain capacity of soil
- Increasing crop diversification
- Establishing vegetables exhibition in monsoon by mulching
- Improvement of irrigation facilities, canal excavation
- Providing training to fallow landowners
- Providing facility to corn processing and marketing
- Increasing crop diversification

4.3.7. Livestock and Poultry

There are no poultry farms, livestock farms, pasture land located within the site premises. However, livestock and poultry, being an essential sector of integrated farming system, play an important role in the economy of the Proposed Site. Livestock provide significant draft power for cultivation, threshing and crushing of oil seeds. Cow dung is used as a source of manure and fuel. Meat, milk and eggs are used for human consumption and a ready source of funds. Most of the households raise poultry and livestock, a practice that significantly reduce the poverty by generating employment and income. The nearby villagers have livestock like cows, goats and sheep and poultries like Duck, Chicken.

4.3.7.1. Feed and Fodder Shortage

The owners of the livestock population are facing problems in respect of availability of fodder and feeds during the month from March to December due to shortage of grazing fields. Rice straw is the main fodder for cattle. Bran of wheat and rice, oil cakes, powder of cereal crops etc. are the other common fodders. Shortage of grazing area throughout the year aggravates the feed problem to the animal population. Poultry population at family level survives by scavenging and generally, no feed supplements are provided. However, at times kitchen waste becomes feed to the poultry.

4.3.7.2. Livestock/Poultry Diseases

Most common livestock diseases found in the Proposed Site are foot and mouth disease (FMD), Anthrax, Diarrhoea, PPR etc. The got/cyst in head is common disease of goat. Major poultry diseases are Duck Plague, Paralysis, New Castle, Fowl pox, and Dysentery etc. The most vulnerable period is between July to October (rainy season) months for spreading diseases to livestock and poultry populations. The duck plague generally occurs in summer.

4.3.8. Fisheries

4.3.8.1. Introduction

Nationally recognized that Haor region are rich and diversified of Fisheries resources. Proposed Site consists of river, beels and haors, aquaculture ponds, canals and Khals. Details of the fisheries of the study are is given in sections below

4.3.8.2. Habitat Description

Fish habitats of the area are river, beels and haors, aquaculture ponds, canals and Khals. All the water bodies in the area are fresh water bodies. Major water bodies in the Proposed Site are River Kushiya, River Monu, Waterbody Gong various beels. Both natural and cultured fisheries exist in the Proposed Site. Upazila Fishries office stated that 71 Jalmohal in the Upazila are above 20 acres; total ponds are 5495 in number in the upazila.

Fisheries Resources in Moulvibazar Sadar Upazila is furnished in below table.

Table 27: Fisheries Resources in Moulvibazar Sadar Upazila

Resource Items	Number
Total number of ponds	5495
Total water body (Ha)	470
Total number of Beels	102
Total area (Ha)	501.31
Total number of Khals	11
Total area (Ha)	18.85
Total number of Haors	2
Total area (Ha)	5000
Total private fish farms	56
Total boropits	127
Total area (Ha)	63.42
Government fish seed production farm	1
Private nursery	130
Fishery-dependent villages	67
Total fishermen	3482
Fishermen cooperative societies	29
Total number of fish markets	3
Ongoing projects of Department of Fisheries	2

Source: Upazila Agriculture Office

4.3.8.3. Fish Production & Effort

Various varieties of indigenous fishes including carps and many smaller species are available in the district. Fish is an essential staple and plays a very important role in the economy of the area particularly of the haor area. In the fresh water the popular species are rui (*Labeo rohita*), katal (*Catla catla*), mrigel (*Cirrhinus mrigala*), kalabous (*Labeo calbasu*), airh (*Mystur aor*), ghanian (*Labeo gonius*), snail (*Channa stinsus*), boal (*wallagonia attu*), gajar (*Channa*

marulius), gulsha (*Mystus bleekeri*), koi (*Anabas testudineus*), shing (*Heteropneustes fossilis*) and magur (*Clarias batrachus*) etc.

Due to climate changes and natural disasters fish production is decreasing day by day mainly natural species. Fish production recorded in year 2010-2011 in the Maulvibazar Sadar Upzila is 2973 MT. Fish production recorded by Fisheries Department in year 2016-2017 in the Moulvibazar district is 38864 MT. Fishing is practised by fishermen in the area for meeting their daily requirement and for commercial purpose. Fishermen use various types of gears viz. seine net, cast net, lift net, push net, pull net, gillnet, etc for catching fish.

Major riverine species in the Proposed Site are Rui (*Labeo rohita*), Kalibaus (*Labeo calbasu*), Ghonia (*Labeo gonius*), Bhargon bata (*Labeo bata*), Tatkini (*Cirrhinus reba*), Pabda (*Ompok spp.*), Tit punti (*P. ticto*), Rani (*Botia Dario*), Tara baim (*Macrognathus aculeatus*), Boro baim (*Mastacembelus armatus*), Batasi (*Pseudeutropius atherinodes*), Golsha (*Mystus cavasius*), Narkali chela (*Salmostoma bacaila*), Kaski (*Corica soborna*), Shilong (*Silonia silonia*), Chapila (*Gudusia chapra*), Tengra (*Mystus tengra*), Boal (*Wallago attu*), Ayer (*Sperata aor*), Kajoli (*Ailia punctata*), Ghero (*Clupisoma garua*), Rita (*Rita rita*), Chital (*Notopterus chitala*), Kaikya (*Xenontodon cancila*), Chanda (*Chanda nama*), Bele (*Glossogobius giuris*), Golda chingri (*Macrobrachium rosenbergii*), Gura chingri (*Leander styliferus*), etc.

The main floodplain and beel fish species include: Meni (*Nandus nandus*), Shol (*Channa striatus*), Taki (*C. punctatus*), Punti (*Puntius spp.*), Shingi (*Heteropneustes fossilis*), Magur (*Clarias batrachus*), Bujuri tengra (*Mystus vitatus*), Foli (*Notopterus notopterus*), Guchi baim (*Mastacembelus pancalus*), Kolisha/chopra (*Colisa fasciatus*), Boicha (*C. lalia*), Boal (*Wallago attu*), Koi (*Anabas testudineus*), Rui (*L. rohita*), Katol (*Catla catla*), Gura chingri (*Leander styliferus*), etc.

Pond fish species include: Rui (*Labeo rohita*), Kalibaus (*Labeo calbasu*), Mrigel (*Cirrhinus mrigala*), Silver carp (*Hypophthalmichthys molitrix*), Grass carp (*Ctenopharyngodon idela*), Common carp (*Cyprinus carpio*), Thai pangus (*Pangasius sutchi*), Tilapia (*Tilapia mossambicus*), Nilotica (*Tilapia nilotica*), Sharpunti (*Puntius sarana*), etc.

4.3.8.4. Fish Biodiversity & Migration

Mainly rivers of Kushiya, Barak, Juri, etc function as longitudinal fish migration for a number of fish species of which dominants are Rui, Katol, Mrigel, Kalibaus, Golda chingri, Baghayeer, Boal, Ghonia, etc. A number of khals, mostly seasonal in nature, connects the floodplains and beels to the rivers act as major arteries of lateral fish migration of river and beel breeders into the Proposed Site. The fish species (Punti, Tengra, Boal, Rui, etc.) migrate through open khals and channels (such as Mathakhai, etc.) between beels and rivers (Kushiya, Juri and Manu) during the period of late May to August. Perennial beels such as Beri beel, Kery beel, Kantari beel, Chepti beel, Haila beel, Chamua beel, Kumra beel, Hijli beel, Pharwadda beel, etc are used as feeding and nursing ground of most of the open water fishes during dry season. Many fish species migrate horizontally to these water bodies as part of their life cycle. Fish migration is usually restored during pre-monsoon to some extent and largely during peak monsoon. Overall fish migration status is moderate in the Proposed Site.

4.3.8.5. Fisheries Management, Problem and Issues

DBL Industrial Park development will not hamper the fishing activity in the Proposed Site and fish habitats.

4.3.9. Ecological Resources

The baseline ecological surveys were carried out based on various secondary sources (Forest Department Data, Scientific Studies and previous similar studies) which are further validated through field observations and interaction with local people and concerned department. Present biological assessment was carried out for the Proposed Site.

4.3.9.1. Bio-ecological zone

The proposed site and Proposed Site spread across Bio-ecological Zones 5a: Haor Basin and 4d: Surma-Kushiyara Flood Plains of the country.

Figure 27: Bio-ecological Zones

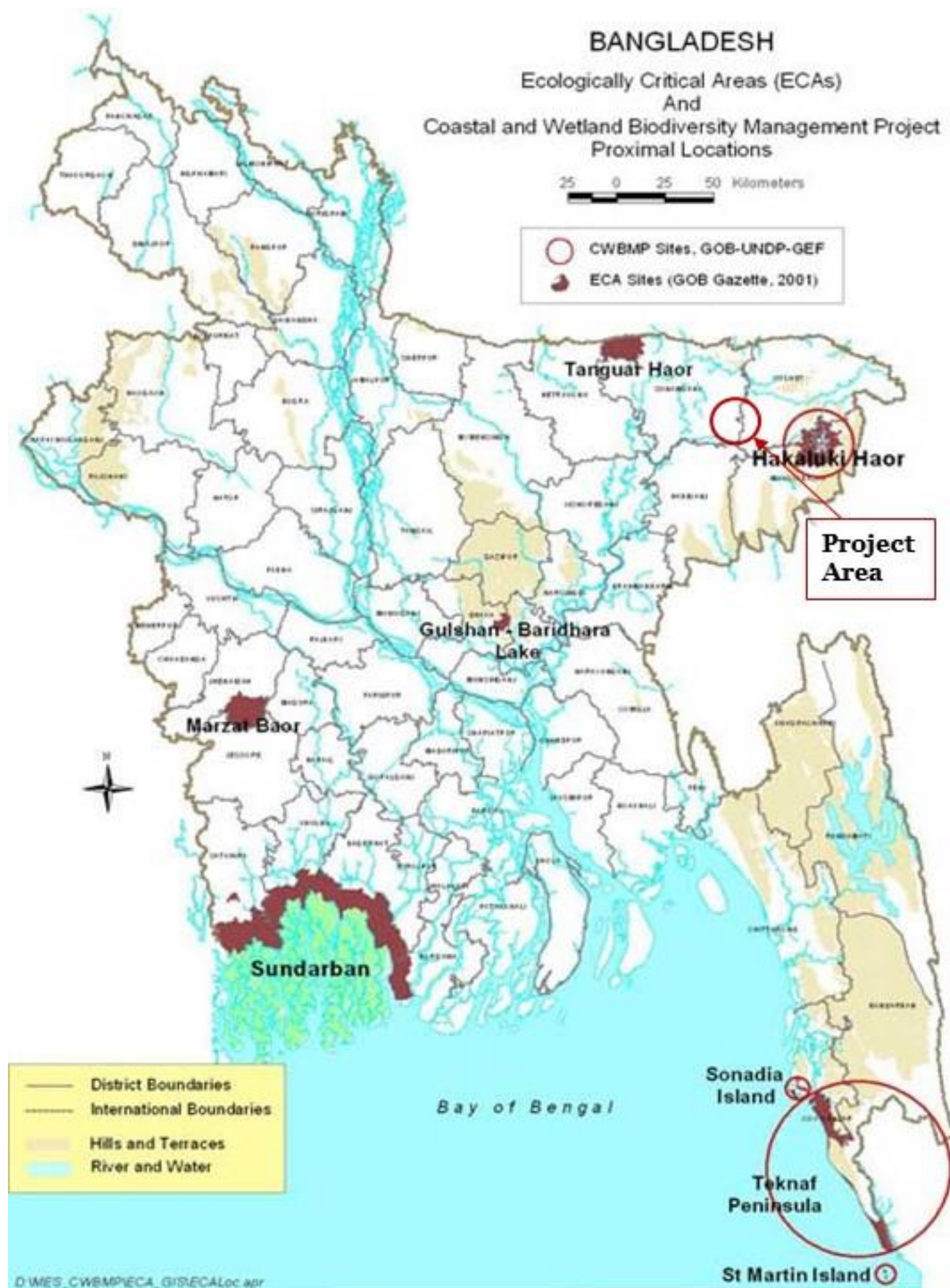


Source: IUCN

4.3.9.2. Protected Area

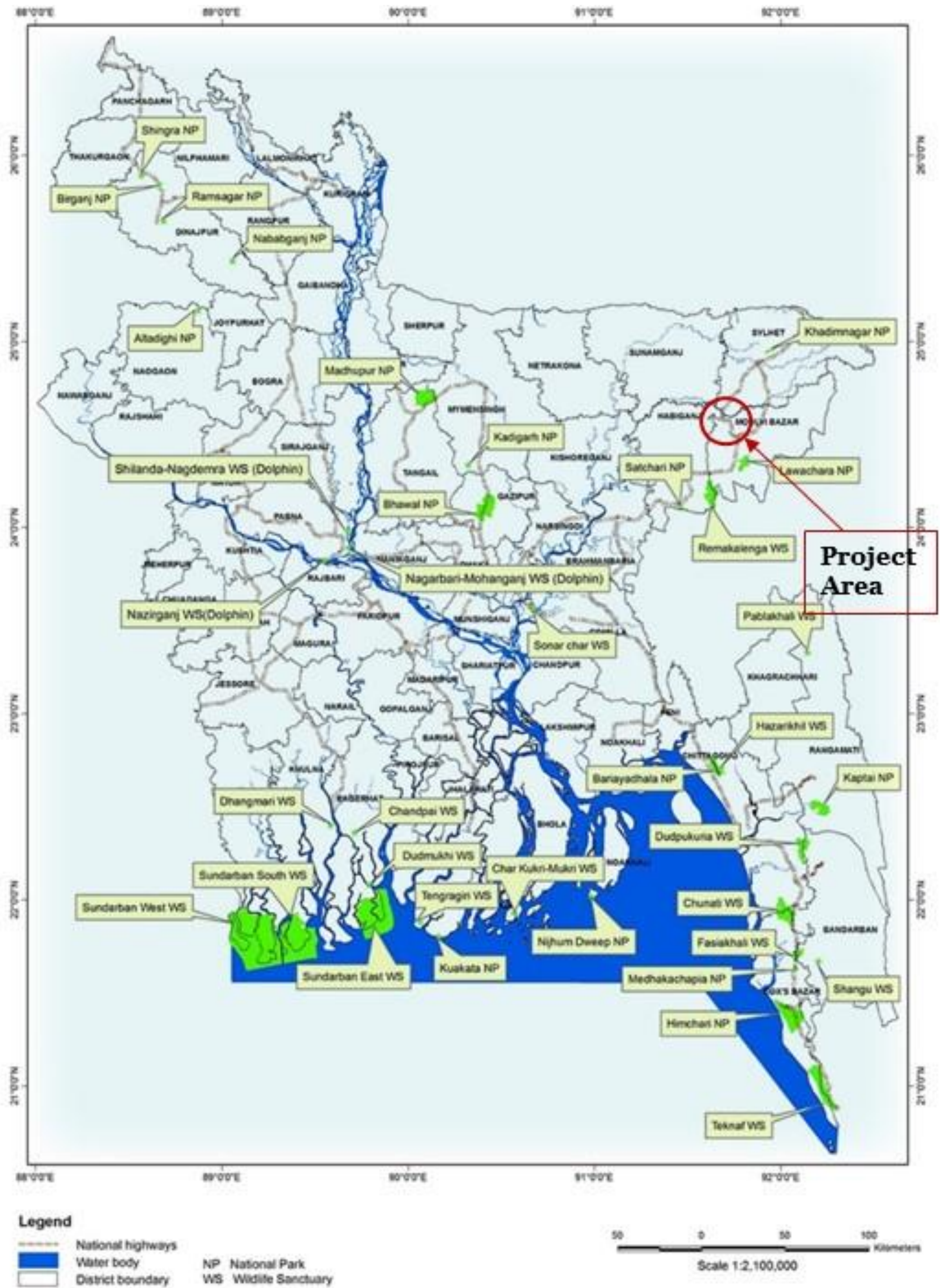
Under the Environmental Conservation Act, ecologically sensitive and precious areas are designated as Ecologically Critical Area (ECA) by Department of Environment in Bangladesh in cases where an ecosystem or biodiversity area is considered to be threatened to reach to a critical state. On the other hand, protected areas such as national parks and protected forests are designated by Department of Forest under the Wildlife Order and Forest Act. There is no protected area or ECA located within the Proposed Site of 10Km radius from proposed site boundary. Following figures show the map of Bangladesh showing location of various ECAs and protected areas distributed across the country. The nearest ECA and Protected area from proposed project site are Hakaluki Haor and Lawachara National Park is located at a distance of 37 Km and 20 Km respectively.

Figure 28: Ecologically Critical Areas of Bangladesh



Source: <http://www.doe-bd.org/cwbmp/>

Figure 29: Protected Areas of Bangladesh

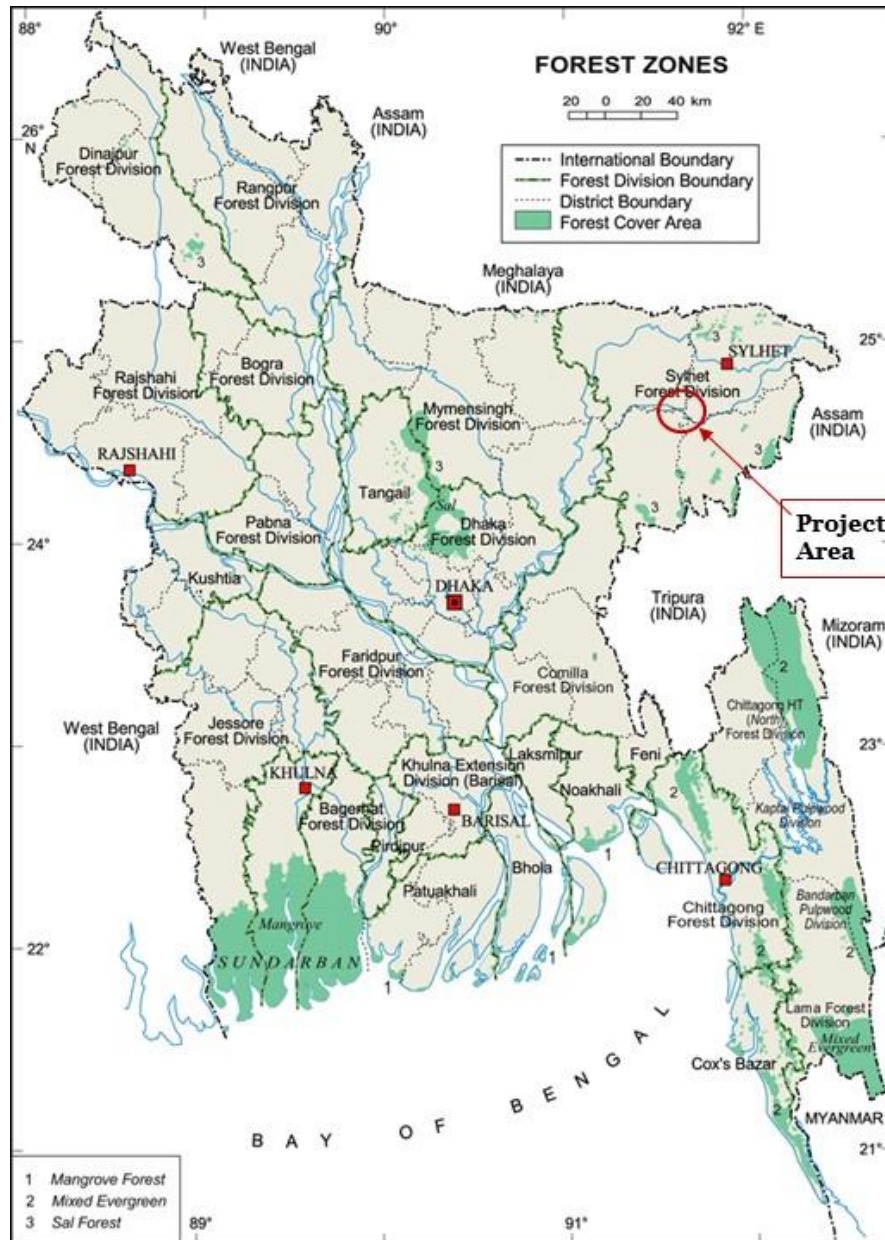


Source: Forest Department of Bangladesh

4.3.9.3. Forest Area/Vegetation Cover

As stated by concerned Forest Department, there is no presence of forest land within the proposed site and 10 Km radius of it. Following figures furnish the forest map of Bangladesh showing the project area.

Figure 30: Forest Areas of Bangladesh



Source: Prime Minister's Office Library, Dhaka

4.3.9.4. Flora & Fauna

Proposed Site is majorly agricultural land followed by vegetation and open land. There is no ecologically critical area within the Proposed Site. Major crops in the Proposed Site are Rice, vegetables & fruits. Fruits grown in area are mango, pineapples, black berry, jack fruits, banana, papaya, coconut, orange, dates, lichi, watermelon, guava, golden apple (bel), palmyra palm etc.

The district Moulvibazar is a broad and level valley surrounded on the east by Cachar district of Asam (India) and on the south by the hills of Tripura (India). All these hills are of considerable height. The district is only a few feet above the sea level. It is intersected by numerous winding and sluggish rivers and is dotted over with huge sauce like depression in some places. These points are filled with water in the rainy season. Due to the existence of the aforesaid peculiarities trees and plants growing in the district are somewhat different from those growing in most of the other districts of the country. Moulvibazar is famous for growing tea which is one of the important cash crops and earning a huge amount of foreign exchange. More than 70% of tea gardens of Bangladesh are located in this district. The topography and the climate of the district are suitable for the growth of pineapples which is an important juicy fruit of the country.

Common tree species found in the project area are Mango (*Mangifera indica*), blackberry (*Syzygium cumini*), jack fruit (*Artocarpus heterophyllus*) banana (*Musa sapientum*), coconut (*Cocos nucifera*), orange (*Citrus reticulata*), papaya (*Carica papaya*), date palm/khajur (*Phoenix sylvestris*), lichi (*Litchi chinensis*) water melon, guava (*Psidium guajava*), wood apple/bel (*Limonia acidissima*) etc.

Among timber species, Jarul or Ajhar (*Lagerstroemia speciosa*), Gundroi (*Inamonom glanduliflorum*), Kurta (*Sida acuta*), Rata (*Dysoxylum binectariferum*) and Poma (*Cerdrela toona*) are largely found in the area. Species like shundi (*Mechelin* sp), ping (*Cynometra polejandra*), koroy (*Albizia procera*), kai (*Dipterocarpus* sp), siturijat (*Enchinocarpus titiacons*) and also black barry (*Syzygium cumini*), gamir (*Citrus limettoides*) marai, kai-eng Banak, jack fruit (*Artocarpus heterophyllus*) trees, haritaky (*Terminalia chebula*), bazang, barun, hizal (*Barringtonia acutangula*) and kuma are also found in abundance in the area.

In the Proposed Site, populations of mammals are low. Small mammals such as fishing cat (*Felis viverrina*), Jungle cat (*Felis chaus*), Bengal fox (*Vulp bengalensis*), Common mongoose (*Herpestes edwardsi*) and bats are major species recorded from project area. The common lizards found within the project area includes the common skunk (*Mabuya carinata*) and the garden lizard (*Calotes versicolor*).

Birds found in the Proposed Site are shyama (*Copsychus malabaricus*), doyel (*Copsychus saularis*), koel (*Eudynamis scolopacea*), Mayna (*Seridotheres tristis*), Nightingale (*Phenonotus cafer*), Asian pied starling (*Sturnus contra*), Common Mynah (*Acridotheres tristis*), Bank myna (*Acridotheres Iginginianus*), Black Drongo (*Dicrurus macrocercus*), Asian Kukoo (*Eudynamis scolopacea*), Red-vented Bulbul (*Pycnonotus cafer*), Spotted Dove (*Streptopelia chinensis*), Jungle Babbler (*Tordoides striatus*), Oriental Magpie Robin (*Copsychus saularis*), House sparrow (*Passer domesticus*), Blackhooded Oriole (*Oriolus xanthornus*), House Crow (*Corvus splendens*), etc.

A large varieties of indigenous fishes including carps and many smaller species are recorded in the project area. In the fresh water the popular species are rui (*Labeo rohita*), katal (*Catla catla*), mrigel (*Cirrhinus mrigala*), kalabous (*Labeo calbasu*), airh (*Mystur aor*), ghania (*Labeo gonius*), snail (*Channa stinsus*), boal (*wallagonia attu*), gajar (*Channa marulius*), gulsha (*Mystus bleekeri*), koi (*Anabas testudineus*), shing (*Heteropneustes fossilis*) and magur (*Clarias batrachus*) etc.

4.3.9.5. Ecosystem Service and Function

No ecological critical area is present within the Proposed Site. Thus due to project development no ecosensitive zone will be disturbed. However, The ecosystem of the Proposed Site is mainly terrestrial and aquatic. Presence of considerable flora and fauna in the Proposed Site currently provides good situation for maintaining good climatic condition of the area. Ecosystem services and function help local people and vice versa. Major benefits of the ecosystem services of the Proposed Site are given below

- The photosynthetic processes remove carbon dioxide in the air and supplies oxygen to the environment.
- Trees serve as sources of fruits, fuel wood etc.
- Fisher, livestock & poultry cater the protein and nutritional needs of community
- The watershed provides water for human consumption and irrigation
- Humus from decomposition of organic matter serve as natural fertilizer in areas

Since project development will be carried out taking all the measures for preventing or reducing environmental pollution, thus project development will not affect the ecosystem significantly.

4.3.10. Socio Economic

4.3.10.1. Socio Economic Condition

Proposed DBL Industrial Park Limited is located at Moulvi Bazar Sadar Upzila in Moulvi Bazar district under Sylhet Division. Sylhet Division is geographically the northeastern division of Bangladesh. The province is known as the Agricultural Capital of Bangladesh. Sylhet is also seen as the economic engine of Bangladesh due to its vast economic prospects. Sylhet is one of Bangladesh's most important spiritual and cultural centres. It is one of the important cities of Bangladesh, after Dhaka and Chittagong due to its importance to the country's economy. Sylhet produces the highest amount of tea and gas in the country.

There are two railway stations near the EZ site – Sylhet Station (35 Km from the site) and Sreemangal Station (43 Km from site). Osmani International Airport in Sylhet is about 55 Km from the site.

Proposed DBL Industrial Park under Shepur EZ, is located in Maulvibazar Sadar Upazila under Moulvibazar district which further comes under Sylhet Division. The Upazila consists of 1 paurashava, 8 wards, 48 mahallas, 12 unions, 196 populated mauzas and 429 villages. (District Statistics Moulvi Bazar, BBS 2011)

Demographic Profile of Moulvi Bazar Sadar Upazila

Population

In 2020, the Moulvi Bazar sadr Upazila has an estimated 72,457 households⁹ with a total population of 3,94,623¹⁰. According to BBS 2011 census, the population of Moulvi Bazar Sadr Upazila comprised of 50.12% male population and 49.87% female population. The male

⁹ Assuming average household size has remained unchanged. As per BBS 2011 census, the average household size was 5.45 in Moulvi Bazar Sadr Upazila.

¹⁰ Assuming an annual growth rate of 1.59% to estimate the growth of Moulvibazar Sadar Upazila. This growth rate was used by BBS to project the population of Moulvibazar district till 2021.

<http://203.112.218.65:8008/WebTestApplication/userfiles/Image/PopMonographs/PopulationProjection.pdf>

female population is almost equal in the upazila which is different from the district data where the female population is higher than male population.

The literacy rate of the Upazila in 2011 was 54.9%, which is slightly higher than the district's average of 51.1%. Male and female literacy rates in the Upazila was 56.4% and 53.5% respectively during Census 2011 with an increase of 6.3, 5.4 and 7.4 percent point in 2011 over 2001 for both sex, male and female respectively. The 2011 data revealed positive trend in women's literacy rate.

In terms of employment opportunity, 50.65% are engaged in agriculture sector, while 43.88 % are engaged in service sector and only 5.47 % are engaged in industry sector¹¹. In the agriculture sector, farming and exporting of bamboo, tea, pineapple, cane, jackfruit, oranges, agar, rubber and mangoes contributes the major sources of livelihood opportunities. The Greater Sylhet region has the largest number of expatriate Bangladeshis abroad, almost half a million in number. Similar to that, a large number of people in the Upazila are either working in abroad or have worked in abroad.

Table 28: Demographic Details: Moulvibazar Sadar Upazila

Administrative Unit	Area (Sq.K M)	Population (2011 census)	Population (2020 Est.)	Total HH (Census 2011)	Total HH (2020 Est.)	Average HH size	Sex Ratio (M/F)	Population Density
Moulvi Bazar Sadar Upazila	344.3 km ²	3, 42,468	3,94,623	62,881	72,457	5.41	101	995

Source: PwC Analysis of District Statistics Moulvi Bazar, 2011, BBS

In Moulvibazar sadar Upazila, majority of the population fall within the age group of 20-59. The percentage of young population is quite high than the dependent population implying that the majority of the population belongs to the employable age group, which is vital for fuelling the economic growth of the local area.

Table 29: Population- age wise details: Moulvibazar sadar Upazila

Age Group	0-9	10-19	20-59	60+
Moulvibazar sadar Upazila (% Population)	25.16	22.44	45.20	7.19

Source: Population and Housing census 2011, Community report: Moulvibazar, BBS

Demographic Profile of Khalilpur Union

The propped EZ Limited falls within Khalilpur Union of Moulvi bazar Sadar Upzila under Moulvibazar district. In 2020, the estimated total population in Khalilpur Union Parishad is 32,631.¹² As per current estimates, the population density per square km is 1,133 which is

¹¹ Census 2011

¹² Assuming an annual growth rate of 1.59% to estimate the growth of population in Khalilpur Union. This growth rate was used by BBS to project the population of Moulvibazar district till 2021.

<http://203.112.218.65:8008/WebTestApplication/userfiles/Image/PopMonographs/PopulationProjection.pdf>

slightly lower than the Maulvibazar Sadar Upazila which is 1,146. While comparing the population of 2011 to 2001 data, the growth rate in Khalilpur UP is 13.6%. In Khalilpur Union, 48.4% of the population is in the age group of 16-49, which indicates that the percentage of middle-aged population is much higher than the dependent population. Majority of the population belongs to employable age group, which is vital for fueling the economic growth of the local and nearby areas. The literacy rate in Khalilpur Union is 45.8 % with male literacy 46.7% and female literacy 45%, which is slightly lower to male literacy.

4.3.10.2. Quality of Life Indicators

Literacy rate and educational facilities

The literacy rate in Moulvibazar sadar Upazila Upazila in 2011 was 54.9%, which is slightly higher than the district's average of 51.1%, and higher than the national level figure (51.8 %). The female literacy rate (53.5 %) is almost equal to the male literacy rate (56.4%).

The literacy rate in Khalilpur Union (45.8%) is lowest among the Moulvibazar Sadar Upazila (54.9%), Moulvibazar district (51.1 %) or the national level figure (51.8 %). The female literacy rate (45%) is almost equal to the male literacy rate (46.7%).

According to the Upazilla Office, the literacy rate in the Moulvibazar sadar Upazilla and Khalilpur Union has increased considerably. However, they do not have official data to support it yet.

Housing Condition

The quality of housing in the area shows that 46.22% people in Moulavibazar sadar Upazila have "kutchra" houses, indicating their social and economic status. The kuccha houses are vulnerable and increase the risk to life in the event of natural disasters such as floods mainly flashflood or cyclones. According to census 2011, 18.84% Pucka, 32.22% Semi-Pucka and 2.17% Jhupri houses have in the Moulvibazar sadar Upazila. The need to provide good housing will be a challenge for the administration and will have to be dealt with effectively.

The household pattern, sanitation facilities and behaviour shows a grim picture of poverty in the proposed EZ area. Most of the households have kutchra houses and a very low percentage of households have pucca houses. The number of people using proper sanitary toilets is small - most people having non-water sealed sanitary ones. 33.78% (census 2011) of households either have non-sanitary toilets or no toilets at all.

According to the Upazilla Office, the housing status of the population and access to sanitary toilets in the Moulvibazar sadar Upazilla and Khalilpur Union has improved considerably. However, they do not have official data to support it yet.

Services

A review of the project area highlights the fact that arsenic contamination of safe drinking water is an intolerable level in the region. Tap water is available to only 6.89% percent of population in Moulvibazar Sadar Upazila. The majority 69.93% of the population in Moulvibazar Sadar Upazila use Tube well, and 18.36% relies on other sources for drinking water such as ponds. The scarcity of water intensifies during the flashflood period.

Sanitation 48.18% (urban 85.11% and rural 42.75%) of dwelling households of the upzila use sanitary latrines and 41.11% of dwelling households use non-sanitary latrines and 9.99% of households do not use have latrines facilities.

Details of various Social Infrastructure/facilities/Common Property Resources (CPR) of Moulvibazar Sadar Upazila is furnished in below table.

Table 30: Social Infrastructure/facilities/CPR of Moulvibazar sadar Upazila as retrieved in 2019

Social Infrastructures	Numbers
Primary Schools	192
Kindergarten	60
High Schools	31
School and College	01
Dakhil Madrasha	14
Senior Madrasa	03
Non-Government College	03
Textile Technical College	01
Government Hospital	01
Non Govt. Health Complex	19
Union Family Planning Center	18
Diagnostic Centres	21
Hat-Bazar	47
NGO	45
Mosque	741
Temple	38

Source: Moulvibazar Statistics Office retrieved in 2019

4.3.10.3. Income & Poverty

Employment Status

Households by Main Sources of Income

The Greater Sylhet region has the largest number of expatriate Bangladeshis abroad, almost half a million in number. Similar to that, a large number of people in the Moulvibazar sadar Upazila are either working in abroad or have worked in abroad.

In terms of employment opportunity, 50.65% are engaged in agriculture sector, while 43.88 % are engaged in service sector and only 5.47 % are engaged in industry sector¹³. In the agriculture sector, farming and exporting of bamboo, tea, pineapple, cane, jackfruit, oranges, agar, rubber and mangoes contributes the major sources of livelihood opportunities.

During public consultation meeting, local people estimated employment opportunity in surrounding the proposed site/villages in the below table;

Table 31: Main source of employment

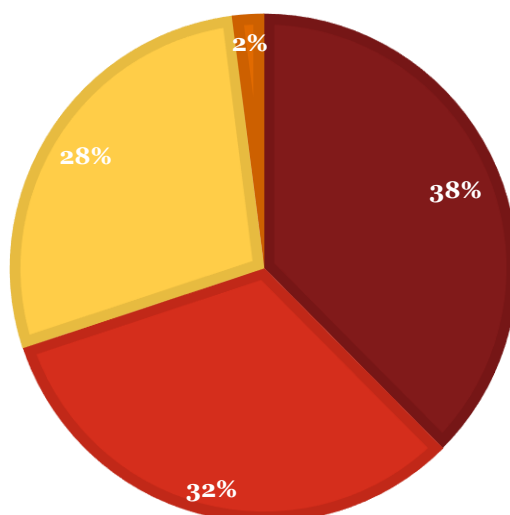
Employment Options	Name of village and Percentage of employment			
	Sherpur	Parkul	Dalarpar	Mozlishpur
Agricultural	30	30	25	40
Business	5	5	10	5
Daily Labour	40	30	25	30
Ricksaw/Van/Auto driver	5	5	10	5
Fishermen	5	10	10	0

¹³ Census 2011

Employment Options	Name of village and Percentage of employment			
	Sherpur	Parkul	Dalarpar	Mozlishpur
Service with abroad	5	10	10	10
Others	10	5	10	10

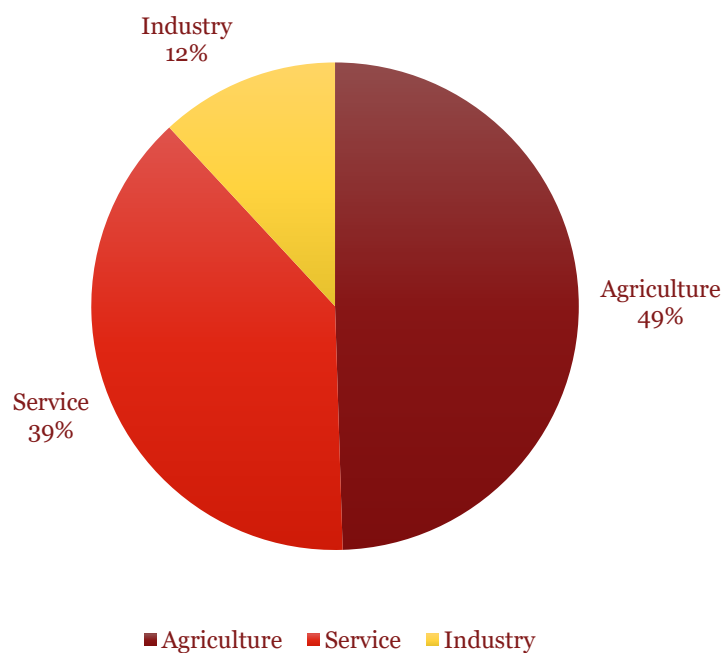
Figure 31: Source of employment (Moulvibazar sadar District) retrieved in 2019

■ Employed ■ Seeking work ■ Household work ■ Not working



Source: Population and Housing census 2011, Community report: Moulvibazar, BBS

Figure 32: Field of Employment (Moulvibazar sadar Upazila)



Source: Population and Housing census 2011, Community report: Moulvibazar, BBS

On basis of above data, the negligence of industry sector in Moulvibazar sadar Upazila comes into the picture. The development of EZ could boost the employment in Industry sector and there can be gradual shift of population from Agriculture to Industry and Service sector.

Poverty information: According to Household Income Expenditure Survey 2016, Moulvibazar district has 7% of ultrapoor population and 11% of the population below upper poverty lines. Compared to national average, 12.9% of the population is ultrapoor and 24.3% of the population below upper poverty lines. The Moulvibazar district is relatively well-off compared to national average. Also, the data on occupations, education and household types are presented to give an idea of the locality. Thus, the EZ will further contribute to the pockets of poverty remaining in the district, improvement of all the unions within the Upazila, and the adjacent ones. It can be expected to change the poverty scenario in a positive way.

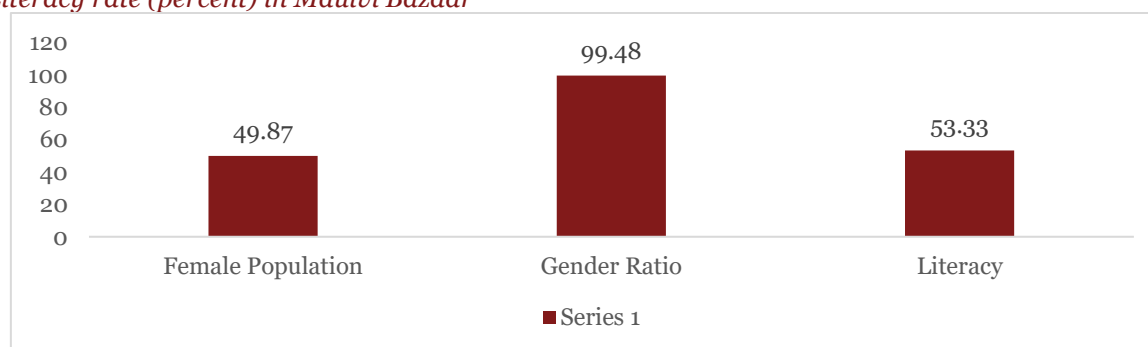
4.3.10.4. Gender & Women

Women and employment status

Women in Bangladesh are at the forefront of awareness and empowerment on account of various interventions by the GoB. Though, Bangladesh has already achieved gender parity in primary and secondary education (Promote Gender equality and empower women, UNDP Bangladesh), the female population, gender ratio, access to labour markets and the role of female in decision-making still leave gaps and this call for an improvement. This is especially true in the rural areas where women currently lack adequate access to resources and opportunities. Being a patriarchal society, the men exercise control over women's access to labour and their income and assets. The following section depict the status of women in Moulvibazar sadar Upazila and khalilpur union.

Population of the male and female in the Proposed Site and in the Upzila is almost equal. Sex ratio in the rural areas of Upzila is 99 and in urban areas is 110. Women are largely unemployed and are engaged in household works only. Very few are involved in agriculture activities. The project will involve development of industries, thereby generating employment for the people. Women may also get the employment in the upcoming industries as large no of skilled, unskilled and semiskilled manpower will be required for the project. The female population in the Moulvibazar sadar Upazila constitute 49.87% of the total population. The female literacy rate is 53.3% (Male literacy rate – 57.1) respectively.

Figure 33: Female Population (percent), Gender ratio (no. of males per 100 female) and Female Literacy rate (percent) in Maulvi Bazaar



Source: Population and Housing census 2011, Community report: Maulavi, BBS

4.3.10.5. Common Property Resources

No common property resources (CPRs) exist is within the propsed EZ. Thus, no impact on CPRs will be caused due to the project development.

4.3.10.6. Conflict of Interest and Law and Order Situation

No conflict of interest is associated with the development of DBL Industrial Park site

4.3.10.7. Historical, Cultural and Archaeological sites

There is no archaeological resource present within EZ site and Proposed Site.

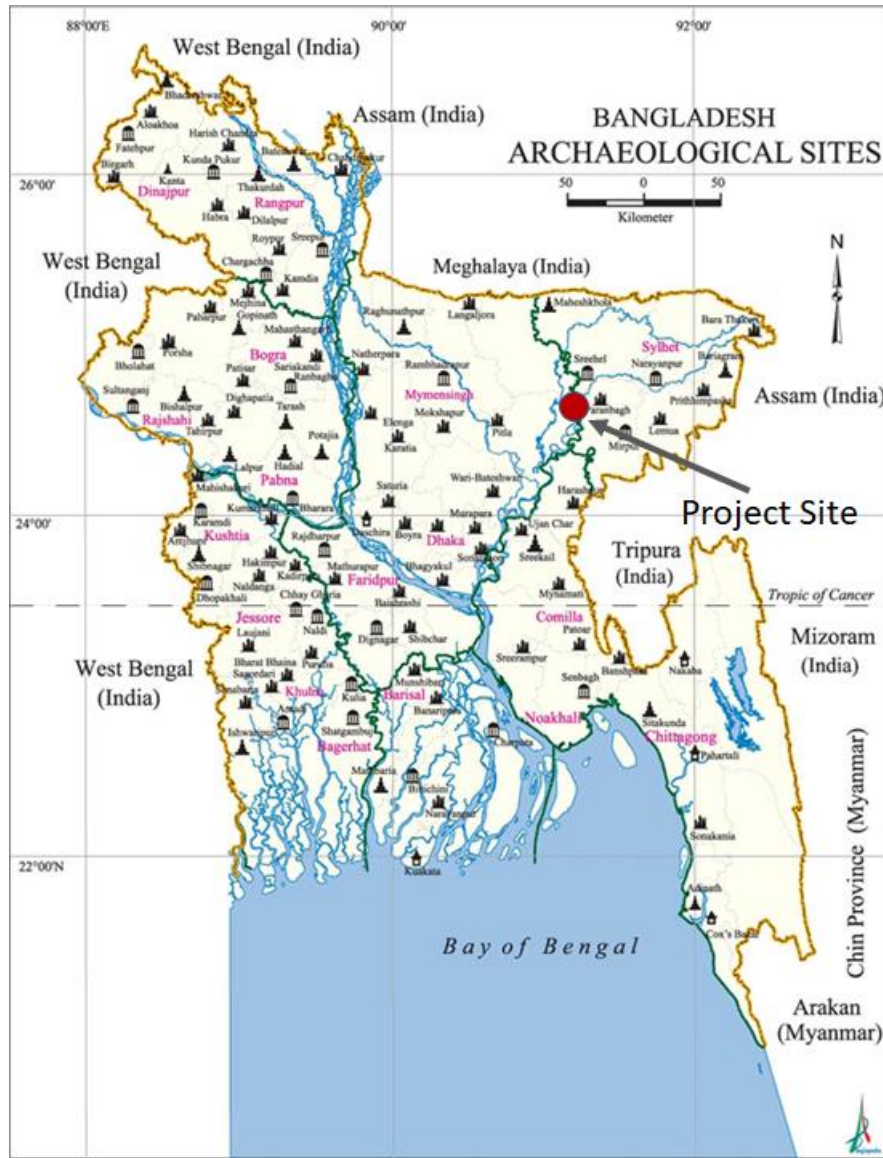


Figure 34 Archeology Map of Bangladesh

Archaeological Resources

Khoja Mosque of Laghati village in Dasher Bazar (Baralekha, 16th century), Madhab Mandir located near the Madhabkunda water fall, Rangirkul Vidyashram (established in the first quarter of 19th century, Kulaura upazila), Nawab Bari of Pritthim Pasha (first quarter of 18th century), Khoja Mosque (14th century, Goiyghar), the temple of Agnian Thakur, Nirmmai Shib-Bari (1454), Gaiyebi Eter Masjid at the premises of the tomb of Kazi Khandker (R), Persian manuscripts of Firoz Shah Tuglak's period (1330 AD), statue of Ananta Narayan (11th century, preserved in the Calcutta Museum) are the important archaeological heritage and relics of the Maulvibazar district.

Historical Events

A battle between the great Pathan warrior Khawasa Osman and Raja Subidha Narayan was fought in 1595 at Rajnagar. During the ***Sepoy Revolt***, in 1857 some 300 sepoys looted the Moulvibazar Treasury and took shelter to Gaus Ali Khan, zamindar of Pritthim Pasha. The physiography of the region was seriously changed due to the earthquake of 12 July 1897. In 1921 Deshbandhu Chittaranjan Das, Maulana Hossain Ahmed Madani and Sarojini Naidu attended the Khilafat Conference and inspired people to join the anti-British movement. At that time, Purnendu Kishore Sengupta established the Viddia Aashram at Rangirkul of Kulaura. Beside these, the ***Nankar Movement*** in 1931-32 and Haor Karaiya Movement in 1968-69 are noted historical events of Moulvibazar. A movement, known as Vanubal Peasant Movement, led by Panchanan Singh, Kasem Ali, Baikuntha Shawrma and Themba Singh was occurred in 1307 BS. During the War of Liberation in 1971 many sanguinary battles took place at Shamsheernagar, Sherpur and other places. Martyr Birsrestha Sipoy Hamidur Rahman was killed at village Aambasa (a border-side village of Kamalganj).

Marks of the War of Liberation: There are 6 mass killing sites, 9 mass graves and 6 memorials in the district. In addition, North Bharaura (Sreemangal), Kulaura Hospital and Nabinchandra High School were used as torturing centers that bear the testimony of War of Liberation in the district.

5. Identification and Analysis of Key Environmental Issues

5.1. Environmental Sensitivity Investigation

Environmental impact assessment has been carried out considering the impacts of proposed interventions with associated activities on important components of the environment and society. Firstly, all of the environmental components sensitive to proposed activities were identified during reconnaissance field visit based on expert observation, local people's perception and standard practice of ESIA. The scoping process, followed to identify the environment and social sensitive features included professional judgments of the multi-disciplinary ESIA team members and public consultation. The preliminarily identified environmental and social sensitive components are listed in sections below.

5.2. Environmental Asset

Environmental assets identified in the Proposed Site are listed below:

1. Air Quality of the area
2. Noise level of the area
3. Water Quality of the area
4. Soil Quality of the area
5. Transportation system of the area
6. Ecosystem of Proposed Site
 - River Khushiyara
 - Water body called Gong
 - Agriculture land and Aquaculture pond

Identified assets of the project area are likely to be impacted due to development of the EZ and off-site facilities at all the pre-construction, construction and operation stages of the project. Project activities which may have an impact on the environmental assets and the associated impacts are listed below. The detailed impact identification and mitigation measures are being prepared and shall be furnished in next deliverable.

Table 32: Environmental Assets of the project area

S. No.	Environmental Assets	Impact	Related Project Activity
Pre-Construction & Construction Phase			
1	Air Quality of Proposed Site	Increment in particulate matters	Site preparation Construction activities Excavation

S. No.	Environmental Assets	Impact	Related Project Activity
			Exhaust from construction vehicles/machinery
2	Noise Level of Proposed Site	Increase in Noise levels	Construction activities Movement of construction vehicles/machinery
3	Fisheries of Proposed Site	Increased sedimentation of water body present nearby.	Increase in run-off from construction/excavated site.
4	Soil Quality of the Proposed Site	Contamination of soil	Soil contamination during the construction phase may result from filling activity, leaks and spills of oil, lubricants, or fuel from heavy equipment and wastewater.
5	Ecosystem: Surface water system of Proposed Site: River Khushiara, water body called Gong and other water bodies	Increased sedimentation of water body, accidental contamination	Increase in run-off from construction/excavated site Accidental spill of construction material
6	Eco-system: Agricultural land	Acquisition of agricultural land; slight change in land use	Land for Proposed EZ site is not agricultural in nature and land use will change very little
Operation Phase			
1	Air Quality of Proposed Site	Air pollution	Industrial emissions and emission from plying vehicles
2	Noise Level of Proposed Site	Increase in Noise levels	Increased traffic movement and industrial operations
3	Transportation System	Traffic congestion	Increased nos. of vehicles carrying industrial raw materials and workers for existing roads. Access roads required to be widened further to accommodate the expected

S. No.	Environmental Assets	Impact	Related Project Activity
			vehicles during operational stage of EZ.
4	Surface water system of Proposed Site: Entry of pollutant into the Gong & other water bodies from upcoming industries in EZ zone may impact the aquatic life.	Degradation of Water Quality & Aquatic life	The proposed EZ will filter and beautify a part of the water body.

5.3. Environmental Hotspot

EZ site and site for proposed off-site facilities lies in Sherpur & Bamongaon Mauza of Maulvibazar District& Sylhet Division. There is no Eco-sensitive/Ecological critical area as per ECA, 1995 & ECR, 1997 within Proposed Site.

However, to the southeastern side of proposed EZ, there is water body called Gong (which is part of proposed Sherpur), receives the storm water run-off from the Proposed Site. Filling or destruction of this water body may impact the drainage pattern of the whole area leading to increased local flooding during rains. Thus, this waterbody should be retained in its original position. The water body also supports the large variety of fishes and other aquatic life which will be disturbed if any modification or change is done to this water body.

Adequate mitigative measures necessarily be implemented in all the project development stages so as no or minimal environmental pollution occurs due to development of project. Industrial effluents, sewage, industrial waste & municipal waste to be generated from the EZ site should be managed to prevent degradation of environmental quality of the Proposed Site.

5.4. Likely Beneficial Impacts

The project involves development of EZ and off-site facilities. It is proposed to develop industries like Spinning Mills, Garments Accessories, Glass Factory, Glass Processing Factory, Ceramic Tiles Factory, Ceramic Frit, Aluminum Ball, Sanitary Ware and Abrasive Tool Factory at the proposed EZ. The likely benefits from the proposed development are listed as below:

1. Rapid Economic development
2. Large scale direct and indirect employment generation
3. Development of infrastructure facilities
4. Technological enhancement for management of environmental management (like water treatment, waste management, environmental monitoring)
5. Permanent source of employment, fixed monthly income;
6. Better living standards

5.5. Community Recommendations

No resettlement & rehabilitation is involved in the land proposed for development of EZ. As per the focused group discussions carried out with people, it was learned that people are in favour of development of EZ. They are expecting overall development in their neighbourhood due to development of EZ. Also, they expect that large scale employment will be generated in the area for both male and females which will enhance their standard of living.

5.6. Alternative Analysis

Various sites have been identified by BEZA for development of economic zone. Pre-feasibility study for various sites has been carried out to analyze suitability of site for EZ development by BEZA. As per prefeasibility study it was found that Shreehata is one of the most potential & suitable zone for development of EZ. Sites considered for development of the economic zone other than Shreehata are listed below:

- Area of app. 205 acres in Mongla Upzila, Bagerhat District
- Area of app. 1390 acres in Anwara
- Area of 500 acres in Mirersheroi

These sites are analyzed on basis of location, accessibility, potential for industrial growth, availability of raw material, infrastructural development, availability of man-power, vulnerability to natural and manmade disasters, availability of the basic amenities (such as power, fuel, water supply etc.) and utilities for industrial development. After analysis ranking has been done for these sites. As per ranking it is found that Shreehata has potential to be developed as EZ site due to its strategic location on Sylhet Dhaka Highway. Mongla & Mirersheroi EZ sites has already being approved for development of EZ. In addition, there are other EZs adjacent to the Sherpur. Factors responsible for selection of Shreehata as site for development of economic zone are given below:

1. Located outside city Corporation, Municipality and Cantonment Board Area
2. Located Near to Osmaina International Airport, Sylhet (app. 55 km)
3. The site lies close to River terminal at Ashuganj on River Meghna, i.e at distance of app. 108 kms from the EZ site
4. Site is well connected by road as it abuts Sylhet Dhaka Highway and Sylhet Maulvi Bazar Highway
5. Railway station close by Sylhet railway station 35 km, Sreemangal railway station 43 km.
6. Project site does not lie within any eco-sensitive zone or ecological critical area
7. Availability of large nos. of un-skilled and semi-skilled labour
8. Availability of power (Bibiyana thermal power plant), gas (Bibiyan gas field) and fresh water in the area.

6. Environmental and Social Impacts

6.1. Introduction

The environmental impacts assessment was carried out considering present environmental setting of the project area, and nature and extent of the proposed activities. The proposed project involves development of EZ for upcoming industries in Moulvi Bazar Sadar Upzila. Potential environmental impacts associated with EZ are classified as:

- impacts during preconstruction and construction phase and
- Impacts during operation phase.

Sensitive environmental components were identified during the site visits and qualitative and quantitative techniques have been applied for direct and indirect assessment of impacts on these components. The classification of environmental components is provided in Table below.

Table 33: Classification of Social and Environmental Components

Components	Sub-component	Parameters
PHYSICAL Water Air Land	Surface water, Ground water Air, noise Soil	Hydrology, water quality Air quality, noise level Erosion, soil quality
ECOLOGICAL Aquatic Terrestrial	Fisheries/ Aquatic species Aquatic Biology Vegetation Wildlife	Species, diversity, economic value Density, species Species, population Species, population
INFRASTRUCTURE Water Supply Electricity Transport Land use Drainage	Surface/ground water — Highways/Roads Rail Air Water	Frequency, quality Generation, Transmission, requirement, Access, availability, type, utility of each mode — Flooding, drainage

6.2. Impact Identification

During the site visit, various environmental sensitive features were identified which may potentially be impacted by the project at various stages. Identified impacts of the project activities on the environment components are given below along with the associated activities. **Fig. 35** shows the step-by-step methodology that was used to develop the risk assessment matrix.

Figure 35 Methodology used to develop the risk assessment matrix

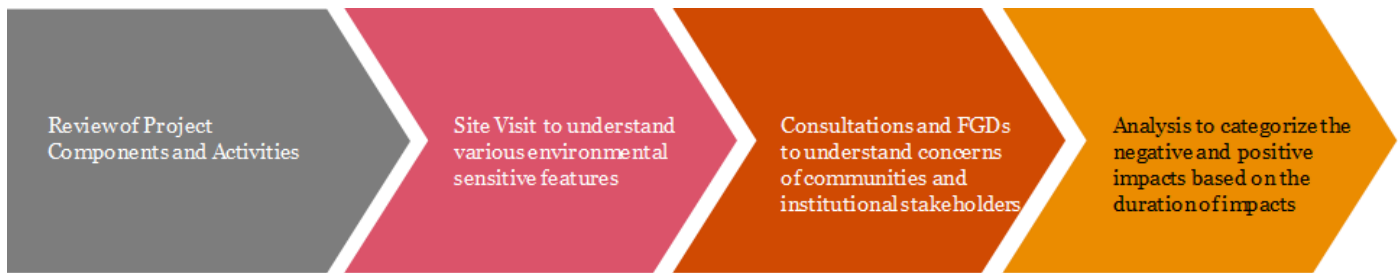


Table 34: Impact Matrix for Proposed Off-site Infrastructure

S. No.	Activities	Impacts	Negative Impact		Positive Impact		Not Applicable
			Short Term	Long Term	Short Term	Long Term	
A	Pre-Construction Phase						
i	Change of Land use pattern	Change in land use pattern due to development of EZ		√			
ii	Change in land type because of the backfilling	Alteration with the natural gradient of the land	√				
iii	Loss of ecosystem	Anticipated loss of local ecosystem inhabited within the subject site					√
B	Construction Phase						
i	Development of EZ and Construction of Boundary wall, Road connectivity, electrical & water supply system, residential-administration building etc	Loss of Top soil		√			
		Soil contamination due to spillage of material	√				
		Surface water contamination	√				
		Air pollution	√				
		Noise pollution	√				
		Increase in traffic	√				
		Un pleasant view	√				
		Impact on Health & safety	√				
		Social impact	√			√	
	Felling of Trees					√	
C	Operational Phase						
i	Operation of Industries	Impact on the ambient Air Quality		√			
		Noise Pollution		√			
		Potential for surface water pollution due to industrial waste discharge		√			

S. No.	Activities	Impacts	Negative Impact		Positive Impact		Not Applicable
			Short Term	Long Term	Short Term	Long Term	
		Economic Development				√	
		Accessibility				√	
		Groundwater exploitation		√			
		Potential for land contamination due to industrial activities		√			
		Improved drainage				√	
		Electrification of the area				√	
		Improved health and sanitation facilities				√	
		Development of improved Connectivity & Accessibility				√	
		Increased Run-off		√			
		Occupational Health & Safety		√			
		Generation of Employment				√	
Ii	Green Buffer development around each industrial plot	- Improved Ecology - Air Quality Improvement - Aesthetics				√ √ √	

Development of the economic zone and the off-site facilities, i.e. access road, site filling, construction boundary wall, administration-residential building, utility supply etc. will involve clearance of site vegetation, leveling of site by filling and cutting, civil construction activities, storage of raw materials like fuel, sand, aggregates, cement, reinforcement etc., storage of debris, excavation of soil etc. All these activities have potential to impact the environment in one or other way. These activities can directly and indirectly impact the environment. Maximum Number of Workers in Construction Phase is expected to be 250 – 300. They will be accommodated at site in the labor Shed. Provision for 1 toilet/20 Workers will be kept and adequate cleanliness will be ensured. Workers will be having access to drinking water, water-soaps-antiseptic for maintaining personal hygiene, First Aid adequately

Similarly, after development of economic zone, it is expected that industries will start coming up in this region and EZ may reach its full capacity in 4-5 years time. Industries like Spinning Mills, Garments Accessories, Glass Factory, Glass Processing Factory, Ceramic Tiles Factory, Ceramic Frit, Aluminium Ball, Sanitary Ware, Abrasive Tool Factory and 1 captive power plant has been proposed. More than 5,800 manpower is expected to be engaged during the operation phase. There will be total 4 Boilers within in the proposed Industrial Park. About 68 vehicles (Car and Coverd Van/Pick up) are expected to be operation at operation stage. Development and operation of the industries, captive powerplant may have impact on the environment and society as well as on other natural resource if adequate mitigation measure is not planned.

Impact as envisaged on various environmental components during Pre-construction, Construction and operation phase has been discussed in the subsequent sections and mitigation measures to abate environmental impact are proposed.

6.3. Impact on Climate and Meteorology

6.3.1. Pre-Construction, Construction and Operation Phase

Proposed project site is located in tropical region where summers are much rainier than winter. Though no change in the macro-climatic setting (precipitation, temperature and wind) is envisaged due to the project, the microclimate is likely to be temporarily modified by vegetation removal, the addition of increased pavement surface and industrial operation which in turn might lead to rise of temperature especially during the daytime. The operations of captive power plant in the EZ would result in GHG emissions. However, since it is a natural gas based captive powerplant, the magnitude of the emissions would be relatively less compared to a coal-fired or diesel-based power plant. Moreover, the industries to be established in the EZ will not generate any heavy pollutants that may cause climate change in the area. Also, if the mitigation measures are taken properly, climate will not be impacted.

Mitigation Measures

- Greenery/Open Space inside the EZ has been proposed
- Plantation shall be carried out at suitable location to minimize impact on micrometeorology

6.4. Impacts on Air Environment

◦ Pre-construction phase

The pre-construction phase will involve site preparation activity for development of EZ, access road and water supply system which will lead to dust generations and other fugitive emissions. But these emissions will be localized and have impact for short duration only.

To minimize the dust generation, water should be sprinkled regularly at the site and usage of low sulphur diesel is preferred in land levelling equipments, vehicle and construction equipments to control the SO₂ emissions.

◦ Construction Phase

The proposed project involves construction activities which includes:

- site development (land filling, earth work, excavation);
- civil construction;
- construction material handling and stockpiling; and
- Vehicular movement which will generate fugitive dust and vehicular emissions.

Air quality will be impacted from the following sources during the construction phase:

- Fugitive dust emissions from site development, excavation work, cutting and levelling work at sites and access/ internal roads, stacking of soils, handling of construction material, transportation of material, emission due to movements of vehicles, plying of heavy construction machinery etc.;
- Vehicular emissions due to traffic movement on site and on the connecting roads;
- Exhaust emissions from construction machineries, other heavy equipment as bull dozers, excavators, compactors; and
- Emissions from diesel generator required for emergency power during construction period.

Gaseous emissions containing PM₁₀, PM_{2.5}, SPM, CO, HC, NO_x, SO₂ and lead will be released from the vehicles, construction equipment and dredger exhaust. The vehicular movement on the unpaved roads will also result in the fugitive dust emissions. The movement of trucks carrying construction material to the site during the construction will lead to fugitive and exhaust emissions which would impact the people in the project area of influence. The movement of heavy trucks also increase the potential for road accidents.

Mitigation Measures:

To mitigate the construction impacts, the project proponent should have contract agreements with contractors as well as sub-contractors to implement the measures provided in EMP.

- Sprinkling of water at construction site and haul roads
- Construction of barricades between the settlements and the site to minimize travel of fugitive emissions towards settlements
- Tree Plantation on either side of the approach road to mitigate the fugitive dust emissions
- Tree plantation shall be done keeping in mind the native species. Some of the species of plants which are the native species and can be grown on both the side of the roads are *Neem (Azadirachta indica)*, *Gab (Diospyros ecbryopteris)*, *Guava (Psidium guava)*, *Jam (Syzygium spp)*, *Aam (Mangifera indica)*, *Supari (Areca catechu)*, *Tal (Borassus flabellifer)*, *Kul (Zizyphus jujube)* & *Zizyphus mauritiana*.
- Having fruit bearing trees shall not only attract tourist, minimize the impacts of air pollution but also attract birds and aves because of the fruits.
- Apart from having trees along side the approach road and the internal road, patches of land shall also be dedicated for taking up plantation activities. All these trees (mentioned above) shall be planted to enhance the greenery of the area and also attract more birds, reptiles and .
- Minimizing stockpiling by coordinating excavations, spreading, re-grading, compaction and importation activities
- Cease or phase-down work if excess fugitive dust is observed, investigate source and take suppression measures such as water spray
- Adequate parking space should be provided for the construction vehicles so as to prevent idling of the vehicles and the emissions generating from them
- Vehicles carrying construction material and debris should be covered with tarpaulin cover

- Raw materials, excavated soil and other debris should be stored under covered sheds or cover with tarpaulin
- Green buffer should be developed all along the EZ boundary
- Provision of face mask to workers to minimize inhalation of dust particles
- Construction vehicles and machinery should be regularly serviced and check for pollution control
- Low sulphur diesel should be used for running construction equipment and vehicles
- Covering the scaffolding (in case of building) to reduce the dust emission in outside environment
- Speed of vehicles on site is recommended to be 10-15 km/hr which will help in minimizing fugitive dust emissions due to vehicular movement

◦ **Operation Phase**

Post development of the EZ & setting up of industries, there could be impacts on the air quality of the area. Industrial development will involve generation of emissions and increased vehicular movements. These altogether may have overall negative impact on the air quality of the site and the nearby areas. The type of industries to be accommodated within EZ are Spinning Mills, Garments Accessories, Glass Factory, Glass Processing Factory, Ceramic Tiles Factory, Ceramic Frit, Aluminum Ball, Sanitary Ware, and Abrasive Tool Factory.

It is envisaged that particulate matter, sulphur dioxide, metals and other criteria pollutants like ozone, oxides of nitrogen and carbon monoxide will be generated during industrial operations. Nature of potential air emissions due to various industrial operations are furnished in the table below

Table 35: Emissions potential from various industries

Industry Type	Nature of Emission
Garment Accessories Spinning mills	These industry types comprise of heat setting process. The heat generation will be through boiler operations. The major air pollutants envisaged to be generated from boiler operation for heat generation include Suspended Particulate Matter (SPM), sulphur dioxide gas, oxide of nitrogen gas, etc. The hydrocarbons are emitted from drying ovens and from mineral oils in high-temperature drying/curing. The residues from fibre preparation also emit pollutants during heat setting processes. Carriers used in batch dyeing of disperse dyes may lead to volatilisation of aqueous chemical emulsions during heat setting, drying, or curing stages. Inhalation of the dust generated where cotton fibre is converted into yarn and fabric significantly contributes to byssinosis (an occupational lung disease).
Glass and glassware Ceramics products Sanitary ware	Pollutants released from glass and ceramic industries are Particulate Matters, Sulphur oxides (SO _x), Nitrogen Oxides (NO _x), carbon monoxide (CO), carbon dioxide (CO ₂), Nitrous Oxide (N ₂ O). Also emissions of heavy metals are produced by the melting process of glass.

Industry Type	Nature of Emission
Captive Power Plant (Gas Based)	Cleaner burning than other fossil fuels, the combustion of natural gas produces negligible amounts of sulfur, mercury, and particulates. Burning natural gas does produce nitrogen oxides (NO _x), which are precursors to smog, but at lower levels than gasoline and diesel used for motor vehicles.

Mitigation Measures

- Provision should be made for peripheral green belt all along the EZ boundary. Green belt should have minimum of three rows of local variety of tree.
- Tree species should be selected such that first inside row is of smaller height, middle row of tree is of medium height and last row of tree is of higher height so that green belt formed appears like a canopy.
- Development of thick green belt and organized greens within each industrial plots
- Power Generators should be provided with stacks of adequate height (higher than nearest building) to allow enough dispersion of emission.
- Process emission if any should be controlled with the installation of adequate air pollution control systems like Venturi scrubbers, wet scrubbers, Electrostatic precipitator, cyclone separator & bag filter etc. as applicable to the individual industry
- All industries should obtain clearance from DoE, Bangladesh as applicable. Air pollution control measures shall be adopted by respective industries in line with DOE permission
- Air pollution monitoring should be carried out by all industries to check the air pollution level.
- Preference of usage of clean fuel like LPG, low sulphur diesel should be explored
- Energy conservation should be adopted by opting the alternate energy options like solar power
- Odour should be managed at the site using odour suppressant and planting fragrant flowering trees.
- For woven fabric industries, periodic checkups should be done for the workers. Rotating of workers shall be done to reduce exposure levels. OSHA and the American Conference of Governmental Industrial Hygienists (ACGIH) standards set 0.2 mg/m³ respirable cotton dust as measured by the vertical elutriator as the limit for occupational exposure to cotton dust in textile yarn manufacturing. Monitoring units for air quality must be installed and periodically checked at upstream and downstream wind flow directions and the analysis results should be within the limits as provided by the DoE.

6.5. Impact on Noise Environment

◦ Pre-construction and Construction Phase

Pre-construction phase will involve site preparation activity for development of access road and utilities. The site clearance will involve land levelling activities. Operation of different machineries and equipments for construction activities, running of heavy load traffic for construction materials transportation, and regular traffic movement may generate noise during construction period. The

heavy equipment, machineries, transportation and earthworks used for the construction activities are the major sources of noise. It is envisaged that there will be an increase in traffic and thereby in traffic noise impacts on the receptors near the approach road from the transportation of equipment, construction materials. The residents in the vicinity of the site would be impacted due to the noise generation. Table below shows the typical noise levels generated by some of the construction equipment expected to be used during the construction phase. As seen from the Table below, the local peak noise level for non-continuous construction activity may reach to as high as 96 dB(A), depending on the type of equipment. The impact, however, is expected to be temporary and localised.

Table 36: Noise levels generated by construction equipments (measured at 1 m distance)

Equipment	Noise Level (dB(A))
<i>Earth Movers</i>	
Front Loaders	72-84
Backhoes	72-93
Tractors	76-96
Scrapers, Graders	80-93
Pavers	86-88
Bull dozer	86-88
Excavator	84-86
Trucks	82-94
<i>Material Handlers</i>	
Concrete Mixers	75-88
Concrete Pumps	81-83
Cranes	75-86
Winch	85-88
<i>Stationary</i>	
Generators (in canopy)	71-82
Electric Saw	81-85
Wood Planer	81-85

Noise levels will have compounding effect when multiple equipments and trucks operate at the same time. Thus the actual noise level at the site and surroundings would be much more than given in the above table.

Mitigation Measures

The following mitigation measures will be implemented to minimize potential noise impacts during the construction phase:

- Regular maintenance of equipment such as lubricating moving parts, tightening loose parts and replacing worn out components should be conducted;
- Machinery and construction equipment that may be in intermittent use should be shut down or throttled down during idle time;
- Acoustic enclosure will be provided for the DG set;
- Equipment known to emit noise strongly in one direction should be orientated so that the noise is directed away from nearby sensitive receptors as far as practicable;
- Provision of temporary noise barrier in working area should be kept
- Honking should be avoided;
- Construction work should be carried out only during day time (from 8.00am to 6 pm); and
- Machinery to be used should comply with the noise standards prescribed by DoE.
- To deal with noise exposure by construction workers in construction site, pocket guide by OSHA is helpful.

The following noise reduction measures are suggested in the pocket guide.

Reduce It: Reduce the noise by using the quietest equipment available. For example, choose a smaller, quieter generator.

Move It: Move the equipment farther away with the use of extension cords, additional welding leads, and air hoses. Noise levels go down as we increase our distance from a noisy object. Move the generator (example) farther away or face it in a direction that is away from where most people are working. If you are not required to be in a high noise area, move to a quieter area.

Block It: Block the noise by building temporary barriers of plywood or other on-site materials to keep the noise from reaching workers. Place a five-sided, oversized wooden box over the generator. Add fire-resistant acoustical absorbing material (foam) inside the box. If the generator sits on soil or sand, that will help absorb some of the noise.

At individual worker level, the construction contractor should be insisted to provide earmuffs to the workers exposed to high noise levels.

◦ ***Operation Phase***

After development of economic zone, the noise levels may rise due to vehicular movement, DG set, pump sets, boilers operations and other industrial operations. Auxilliary activities like operation of water pumps, booster pumps during operation phase of economic zone will also impact the noise environment. Operations of ventillations units and fans can also add up to the noise emissions. The following mitigation measures are proposed to mitigate the noise pollution during operation phase.

Mitigation Measures

- Pumps should be fitted in close room, preferably acoustic enclosure to reduce the noise generation
- Green buffer should be developed all along the project boundary. Green buffer should compose of the 2-3 rows of plants of variable height and thick canopy so as to form continuous barrier. This will help in reducing the noise level significantly.
- Noise regulators must put a strong mandate and fine on vehicle operators which are not properly maintained, produce noise (silencers not proper).
- All industries should obtain clearance from DoE before establishing industrial unit and should comply with all the conditions mentioned in the f environment clearance
- All industries should install the new machinery of modern make which complies with the noise standards prescribed by DoE.
- Job rotations should be practiced for workers in working at noise intensive locations to prevent prolonged exposure to high noise level as it may lead to deafness, fatigue, head ache, nausea and drowsiness. Proper PPEs must be made compulsory for workers working at locations where the intensity of noise is high.
- Acoustic design with sound proof glass paneling will be provided for critical operator cabins / control rooms of individual modules as well as central control facilities.
- Proper greasing, periodic checkups for frictionless movements.
- Honking should be prohibited within the economic zone

6.6. Impact on Water Environment

◦ Pre-Construction and Construction Phase

Significant quantity of water will be required for various construction activities & domestic purpose. The water demand is proposed to be met either through ground water or through surface water is available from the Kushiyara River within 1 Km. There is a large water body (called Gong) in the southern part of the site.

Mitigation Measures

- Water for curing can be saved by carrying out curing in early morning or late evening and covering structures with gunny bag so as the moisture can be restored for longer time.
- Regular inspections at site to monitor leakages in water storage tanks
- Temporary storm water drains and rain water harvesting ponds should be constructed so as to store rain water for construction activities.
- Creating awareness among construction workers about the importance of water conservation
- Storing the curing run-off and waste from other construction activity and using the same for sprinkling.
- Regular inspections at site to monitor leakages in water storage tanks.

- Covering the water storage tanks at site to prevent evaporation losses.
- Undertake Step-Test and Pump Test before abstracting groundwater (if ground water is withdrawn) to understand the sustainable rate of groundwater withdrawal. The rate of groundwater withdrawal shall not exceed the sustainable flow rate which have minimum impact on the groundwater table.
- Tapping should be made at a different aquifer from the aquifer from where the local people have tapped for water for drinking and domestic purposes

Impact on Surface Water and Groundwater Quality

The major source of wastewater generation during construction phase is from the labour camp, which will be established for project construction activity. There is a potential for contamination of surface and groundwater resources resulting from improper management of sewage.

The quality of water bodies could also be affected due to surface runoff from contaminated soil (soil contamination may take place due to oil/ fuel spillage and leakages), particularly during monsoon season. The surface runoff carrying the loose top soil will lead to increased sedimentation in the receiving water bodies. Contamination to water bodies may also result due to oil spilling during construction activities and/or surface runoff from the construction site to the adjacent water body. Thus measures are required to be taken to minimize the surface water pollution

Mitigation Measures

- To avoid excavation activities during rains
- To prevent piling up of excavated soil, raw material and construction debris at site by proper management and disposal
- Minimize run-off by using sprays for curing
- Maintaining appropriate flow of water sprinklers at site
- Construction of storm water drains along with sedimentation tanks with sand bags as partition as barrier for direct flow of run off to river
- Collection & Reusing of curing over flow, tyre wash water etc within the site
- Construction of adequate nos. of toilets and proper sanitation system for workers to prevent open defecation along the river banks/water supply lines
- Construction of soak pits/septic tanks to dispose-off the domestic wastewater generated from labour camps to prevent disposal of sewage in surface water bodies
- Proper collection, management and disposal of construction and municipal waste from site to prevent mixing of the waste in run-off and entering the water bodies
- It should be ensure that no debris/construction material should enter the waterbody in the area
- Labourers should be given training towards proactive use of designated areas/bins for waste disposal and encouraged for use of toilets.
- Spill/ leakage clearance plan to be adopted for immediate cleaning of spills and leakages

◦ **Operation Phase**

The water requirement is envisaged to be sourced from the Kushiara River which is in 1 Km radius of the project, as well as from the existing large water body in the southern part of the site. The development of economic zone shall lead to the generation of process and domestic effluent. Following table presents industry wise nature of effluent likely to be generated

Table 37: Waste water generation potential from various industries

Industry Type	Nature of Effluent
Garment Accessories	Dyeing units which are an integral part of textile units are the main source of process waste water. The waste water generally has high TDS, high BOD, COD and the color quotient of the water is also high.
Glass and glassware	Effluent of ceramic/glass based industry may contain paint residue.
Ceramics products	
Sanitary ware	

Beside effluents, domestic and cleaning waste likely to be generated from kitchens, canteens, toilets and also from the residential set-ups within the EZ for staffs shall contribute to the domestic waste water.

The direct discharge of the untreated process and domestic effluent waste will lead to impacts in the surface water quality. Also, it is anticipated that surface run-off may significantly increase post development of economic zone which may impact surface water quality.

Following measures should be adopted during operation phase to minimize impacts of development of Economic zone on water quality:

Mitigation Measures

- Each industry should obtain consent of DoE Bangladesh before construction and operation and should comply to the conditions laid by them
- The Industry should also obtain the consent of the water abstraction limit from DoE, Bangladesh.
- No leachate, waste water and waste material should be stored in pervious unlined area/pond.
- Effluent and sewage generated by each industry should be treated in Effluent Treatment Plant (ETP) and Sewage Treatment Plant (STP) respectively and no untreated effluent/sludge should be discharged into any water body. ETPs and STP has been proposed to cater the need of various upcoming industries
- A water balance between the abstracted water and the water diverted for process purposes and domestic purpose shall be developed and based on the volume of the process and domestic waste, ETPs and STPs shall be designed.

- Baseline water quality assessment shall be done. Analysis of the process waste water shall also be done and based on that (peak hours and maximum load concept basis) the ETP and STP shall be designed.
- The effluent treated process waste water shall be analysed and the analysed parameter should be below the Bangladesh Standard (ECR, 1997).
- Each industry should practice rain water harvesting to minimize the water consumption and reduce run-off from the site
- Proper management of waste should be done to prevent any contact between the waste and storm water
- Storm water drains should be lined to separate from effluent drains
- Storm water system should be inspected & cleaned before monsoon every year
- The top soil shall be preserved and used for covering the sand layer at EZ site. Vegetation turffing shall be made at the side slopes of the EZ areas to prevent erosion and siltation in the river.
- Surface water quality shall be monitored periodically
- Ground water quality shall be monitored periodically.
- STP Sludge should be dried into cakes and used as manure for green belt.
- The hazardous ETP sludge has to be dried and incinerated in a controlled environment following the Bangladesh Standards and Guidelines for Sludge Management (2015). For the incineration, an approved third-party vendor may be used.
- Before the ETP sludge will be transported to the third party vendor, it will be stored in a designated paved and covered area due to its hazardous content.
- The generation and disposal of ETP and STP sludge should be recorded in accordance to the obligations mentioned in the Bangladesh Standards and Guidelines of Sludge Management (2015).
- The industries within the EZ shall comply with the all the norms introduced by DoE, Bangladesh. Proper design and application methodology shall be determined before the industrial set-up.
- As, the continuous abstraction of groundwater, could impact the groundwater level, rainwater harvesting units within the subject site shall be constructed to recharge the aquifer especially during the peak months of monsoons.

6.7. Impact on Land Resource

◦ Pre-construction and Construction Phase

At present, the land is vacant. It doesn't have any present utilization with no support to livelihood to any.

The impacts on soil due to the project are as follows:

- landfilling activity
- Soil erosion due to site development and excavation activities;
- Topsoil degradation

- Generation of waste (hazardous and non-hazardous) from site clearance, excavations, civil works and activities of construction workers (general waste and sewage); and
- Possible contamination of soil due to potential spills of lubricating oil, fuel oil, concrete etc.
- There could be alteration with the natural water flow pattern of the subject site because of the alteration of the natural contours
- There could be loss of local ecosystem being inhabited within the subject site

6.7.1. Soil Erosion

During the pre-construction and construction phase, the site development activities including backfilling, construction of the earth structures, labour camps, storage area, toilets will involve removal of top soil which will result in slope destabilization and the land will be more susceptible to soil erosion.

The soil erosion will result in the run-off of the silt to surface water impacting aquatic ecosystem of receiving water bodies with increased suspended sediment load and associated nutrients.

Most important: After landfilling, if the land is be kept for long without further development, it leads to soil erosion due to loose top soil.

6.7.2. Soil Compaction

During construction activities, there will be compaction of soil in the project area due to construction of the internal access roads, movement of vehicles/ construction machinery and work force movement. The soil compaction would impact the soil physical properties such as reduction in pore spaces, water infiltration rate and soil strength etc. The extent of soil compaction is primarily limited to the Project foot print area and surroundings within 100 m distance. The impact is restricted to the construction phase of the project.

6.7.3. Landfilling with dredged material

The project site will require landfilling activity during site development. Land filling material will be procured from a third-party vendor. Relevant documents regarding land filling activities are provided in **Appendix G**

6.7.4. Waste Generation

The construction waste generated onsite comprises of materials such as excavated soil, rocks, concrete, wooden pellets, steel cuttings/filings, packaging paper or plastic, wood, metals etc. Municipal domestic wastes consisting of food waste, plastic, glass, aluminum cans and wastepaper will also be generated by the construction workforce and labor camp site.

The waste generated during the construction phase will also include hazardous waste such as used oil, hydraulic fluids, waste fuel, grease and waste oil containing rags. If improperly managed, solid waste could create impacts not only to land but also to local air quality, water quality and human health. It is

expected that the generation of the waste oil will be insignificant as the DG sets will be used only during the construction phase and the waste oil will be generated only during the maintenance of DG sets.

In the DIPL, sludge generated from accessories factories will be transferred to Cement Factory (Lafarge Holcim) for disposal purpose by paying a disposal fee. Sludge from Ceramic Tiles and Sanitary ware is completely clay and stone materials having ingredients used in the production process which is to be completely reused in the production process.

6.7.5. Soil Contamination

Soil contamination during the construction phase may result from filling activity, leaks and spills of oil, lubricants, or fuel from heavy equipment and wastewater. Such spills could have a long-term impact on soil quality, but are expected to be localized. The soil at project site is sandy clay. If the soil strata has higher permeability, thus allowing contamination at greater depth. Storm water run-off from the contaminated area can pollute the downstream soil and water quality of adjacent rivers.

Spill control measures such as the storage and handling of chemicals and fuel in concrete areas with secondary containment will be implemented to minimize impacts in the event of a spill.

The soil characteristics of the native soil may also be changed due to import of soil for filling and levelling purpose. It is envisaged that the filling activity may impact the native soil due to spillages during transportation of soil and run-off during filling and compaction. Apart from the embedded controls to be included in project design, the following mitigation measures will reduce the negative impacts of construction activities on soil environment:

Mitigation Measures

- Stripping of topsoil should be scheduled as the last mile activity in order to prevent the erosion (wind and water) of soil;
- Care should be taken to minimize percolation of soil used for filling to adjacent water bodies during filling operations. Proper embankment may be provided in the downstream areas to minimize soil percolation to rivers.
- Vegetation should be planned and maintained for slope stabilization and to prevent soil erosion after construction period;
- The disturbed areas and soil stock piles should be maintained moist to avoid wind erosion of soil;
- The routes for movement of heavy machinery should be designated to avoid the soil compaction in other areas;
- Transport vehicles and equipment should undergo regular maintenance to avoid any oil leakages; designate routes for bringing construction material and outside soil;
- Construction contractor should designate the sites to be used for disposal of hazardous wastes including waste oils, solvents, paint and batteries. The Contractor should ensure that no unauthorized dumping of hazardous waste is undertaken from the site;
- Fuel and other hazardous substances should be stored in areas provided with roof, impervious flooring and bund/containment wall;

- The soil used for landfilling should have similar characteristics to the native soil and free of any type of contamination.
- The storm water drainage system shall be designed in synchronization with the existing natural drainage pattern. The direction of the flow shall be engineered to be same as that of the natural flow direction of storm and rain water;
- Post excavation, while achieving compaction, engineering designs shall be implemented to achieve the same level of compaction, which was before excavation. Cement, lime are few of the additives that can be added in recommended doses to strengthen the compaction ability of the soil;
- The construction debris and high silt content of the virgin soil, post excavation, should be kept in a designated location so as to prevent leaching during monsoons. Storm water drains shall be designed and shall be connected with rainwater harvesting pits. Any run-off from the soil stacks and construction wastes shall not be carried away to the surface water system. All the construction wastes and excavated soil shall be temporarily stacked on tarpaulin sheet (in order to prevent leaching to groundwater) and a temporary tin sheet shall be placed on the top (to prevent rainwater to maximum extent to carry the soil and construction wastes to the adjacent river);
- To demonstrate the commitment towards better environment, 26.26 % of total area has been designated for green and open spaces.

◦ ***Operation Phase***

6.7.6. Impact on Soil Quality

After development of economic zone, disposal of industrial domestic and process waste may contaminate land and soil quality of the area. The impact can be significant and long term in case of uncontrolled discharges. Improper disposal of waste (hazardous and non-hazardous waste) may degrade soil quality of the area. As per the assessment the proposed industries in the EZ are Spinning Mills, Garments Accessories, Glass Factory, Glass Processing Factory, Ceramic Tiles Factory, Ceramic Frit, Aluminum Ball, Sanitary Ware and Abrasive Tool Factory. These industries are anticipated to be polluting and hence discharge of the effluent, generated sludge, e-waste shall be done in a planned manner.

Process dry sludge, e-waste, domestic dry sludge could be envisaged as the major source of hazardous waste. All these wastes shall be segregated depending upon the source of its generation. Sludge generated from STP shall be dried using a filter-press and the dried sludge could be used as manure. There is authorized vendor for recycling E-waste in Bangladesh. E-waste generating units shall disposed their e-waste to e-waste authorized vendors. General practice followed in Bangladesh regarding the process waste is storage in a dedicated room. A localized landfill unit could be helpful for waste disposal.

Responsibility for waste disposal varies depending on the waste type. All wastes will be segregated, packaged, and stored in appropriate containers. Waste containers will be appropriately labelled and hazardous waste signs posted at the storage, transfer, and disposal facilities. It will be the responsibility

of Site Services to transport the containerized waste to the Waste Management Area. Shipments off-site will be the responsibility of Logistics including compliant legislative documentation.

Options for on-site waste disposal are limited to three facilities:

- incineration;
- burn pit; and,
- landfill.

Mitigation Measures

- Provision shall be made for proper storage and disposal of industrial waste by receptive industries.
- Provisions shall be made to segregate e-waste with rest of the wastes generated.
- Alliance shall be done with e-waste recycling vendor and the segregated e-waste shall be send to the vendor for recycling purposes
- A Common waste storage areas shall be designated for industrial domestic waste.
- The domestic waste shall be kept away from the industrial waste. Dried domestic waste could be used as manure.
- Waste should be segregated at source into hazardous and non hazardous waste. Further the waste should be segregated into recyclable and rejected waste. Recyclable waste should be sent to authorize vendors for recycling and rejected waste should be disposed off as per the norms specified by DoE for the particular waste.
- Industrial waste generated should be stored on sealed surfaces and should be disposed off as per guidelines of DoE, Bangladesh.
- Local environmental bodies shall be consulted for the initiation for the designing and constructing localized landfill for the disposal of process waste.
- No chemical/hazardous raw material should be allowed to spill over the land and should be operated in covered systems
- Excessive packaging should be reduced and recyclable products such as aluminum, glass, and high-density polyethylene (HDPE) are being used where applicable.
- Organic waste should be resold to value addition industries or can be feeded to live stock.
- Use of advanced techniques to control specific portions of the manufacturing process to reduce wastes and increase productivity.

6.8. Impacts on Agriculture resources

The proposed location for the Industrial Park development doesn't have any land under agricultural use. The land is vacant with no present utilization. The land does not provide any assistance to any means of livelihood to any of the local settlements.

However, the development of the land for Industrial Park has disrupted the natural drainage pattern of the area. As a result, the adjoining homestead based agricultural activities are getting impacted with waterlogging issues.

Mitigation Measures

- The industrial park will develop internal drainage systems which will uphold the existing natural drainage pattern of the area.

6.9. Impacts on Fisheries

The proposed site for Industrial Park development is not presently being used for pisciculture purposes or for fishing purposes. Hence, no impact on fishery is envisaged.

However, due to the disruption of natural drainage pattern as a result of land development for the industrial park availability of natural fisheries in the adjoining areas have been impacted. The natural drainage systems were used for fish migration to and from the project vicinity.

Mitigation Measures

- The industrial park will develop internal drainage systems which will uphold the existing natural drainage pattern of the area. The drainage systems would also be used for fish migration.

6.10. Impact on Ecosystem

The impact on the ecosystem may occur due to loss of habitat and threat to biodiversity. The proposed site location is devoid of any trees or shrubs. Thus the project doesn't envisage any impacts on the terrestrial biodiversity or tree felling. However the uncontrolled disposal of solid and liquid waste in surface water bodies, may impact the aquatic life. Therefore, proper mitigation measures should be taken to minimize the impacts on aquatic biodiversity.

Post development of the economic zone & setting up of industries, there could be some impacts on the ecosystem of the area. Industrial development will involve generation of emissions, effluents and increased vehicular movements. These altogether may have overall negative impact on the eco-system of the site surrounding areas as the air pollutant will impact the existing vegetation and avifauna in the area. If appropriate measures for preventing air, water, soil and noise pollution are taken there will be no significant impact on the eco-system of the area.

Mitigation Measures

- Provision should be made for peripheral green belt all along the EZ boundary. Green belt should have minimum of three rows of local variety of tree. The tree cover will act as habitat for avifaunal species, reptila, insects and smaller mammals
- Tree species should be selected such that first inside row is of smaller height, middle row of tree is of medium height and last row of tree is of higher height so that green belt formed appears like a canopy.
- Tree survival rate should be monitored
- Native species should only be planted in the region
- No waste shall be discharged in water bodies

6.11. Impacts on socio-economy

The project does not have adverse impacts on the socio-economic status of the people. The proposed site area does not have any inhabitant / homesteads. The site also does not have residential settlements, structures, CPRs, commercial and business outlets. The land presently does not provide any means of livelihood to any of the residential settlement around the proximity of the subject side. Therefore, no adverse socio-economic impacts could be foreseen because of this project. However, when the land parcel was acquired by BEZA, there were a small number of sharecroppers who lost their livelihoods at the time of acquisition. These sharecroppers were not eligible for compensation because they were not titleholders or squatters as the definition.

Rather, due to the process of developing EZ, employment opportunities will be ensured through three channels (i) direct employment for unskilled labour, (ii) indirect employment to the local community; and (iii) employment of workers. Direct employment includes site preparation, excavation, loading and offloading of materials and deliveries, mason and construction works, industrial operation works. Further, the workforce force will be requiring food and other items, which is expected to be supplied by the local eateries, retail shops and the local community. The local community members can take advantage of these opportunities. Employment generation benefits improve the quality of life of the labourers and enhance their productivity and living standards. Employment generation, both direct and indirect, through EZ will have a significant impact on human development and poverty reduction in the surrounding area.

Mitigation Measures

- The sharecroppers who were affected during the original land acquisition activities may be given preferential opportunity for employment in the construction activities as well as in the operations phase of the project.
- The residents near the project vicinity may be given preferential opportunities for employment and trainings to enhance their livelihood and extend the project benefits to the locality.

6.12. Impacts on Occupation Health and Safety

The lack of adequate mitigation measures on the health and safety of the workers will result in accidents and injuries leading to loss of life or property. It is proposed to implement the following mitigation measures to ensure safe workplace for the construction labor as well as industrial workers. Individual industries should ensure safe workplace during industrial operation.

Mitigation measures:

- The EZ owner should ensure that the contractor (make part of contractor's contract) to have and occupational health and safety plan. DBL Industrial Park needs to adopt an EHS Management Plan, which will be shared to contractors, individual industries and respective DBL Industrial Park officials. It will clearly guide about the potential EHS Risks associated with the Construction and operation Phase and measured need to mitigate them.
- The contractor should conduct daily toolbox meeting for all workers to discuss potential work related hazards and other safety aspects.

- The contractor should conduct training for all workers on safety and environmental hygiene at no cost to the employees.
- The contractor should maintain first aid facilities for the workers and will instruct and induct all workers in health and safety matters (induction course) including construction camp rules and site agents/foremen will follow up with toolbox talks on a weekly basis. Workforce training for all workers starting on site will include safety and environmental hygiene.
- Fencing on all areas of excavation greater than 1m deep and sides of temporary works should be observed.
- Workers should be provided with appropriate personnel safety equipment such as safety boots, helmets, gloves, protective clothes, dust mask, goggles, and ear protection at no cost to the workers.
- Reversing signals (visual and audible) should be installed on all construction vehicles and plant.
- Contractor should at all-time keep the first aid kit at the construction sites.
- Contractor should be responsible for evacuation injured person to the nearest medical center
- Pertinent H&S trainings should be provided to all the workers with respect to hazards linked to the activities. Additionally, the workers will be informed of precautions to be taken to avoid impacts to the local community;
- Maintain H&S records of occupational H&S incidents, accidents, diseases and dangerous occurrences
- Ensure that PPE is available at all times at site;
- In event of accidents, the contractor will be responsible for immediate evacuation of injured person to the nearest medical center. The contractor should bear medical and other expenses of the injured person.
- The contractors should ensure H&S standards of labour camps. The labour camps will be established in the proposed site area. Additionally, the Environmental Expert of the team should conduct random spot checks to determine any issues related to improper waste disposal or the living conditions in these camps (i.e. presence of secure shelter and flooring, number of persons per room, number of toilets for the manpower, water availability etc.);
- Strong protocols should be built as part of contractual obligations around zero tolerance of child labour or harassment of women workers and even health and safety aspects. These should also be monitored by supervision and monitoring team.
- During operation phase, individual industries should ensure necessary mitigation measure to ensure safe workplace
- Due to the recent COVID-19 outbreak, the borrower should take specific safety measurements. Adequate masks and hand sanitizer should be supplied to the workers. Social distancing should be ensured and if possible, suitable PPE should be provided.

6.13. Sanitation and Disease Vectors

Potential sanitation and impacts from disease need to be controlled by maintaining hygienic conditions in the EZ area throughout the operational phase as well during construction by implementing appropriate social and health programs for the Project. DBL Industrial Park Limited should ensure

that improvements are made to site sanitation and should implement the mitigation measure below for all operational activities and also that the contractor ensures that:

- Measures to prevent malaria should be implemented by installation of proper drainage to avoid water stagnation, etc.
- Standing water should not be allowed to accumulate in the drainage facilities or along the warehouse sides to prevent proliferation of mosquitoes.
- Temporary and permanent drainage facilities should be designed to facilitate the rapid removal of surface water from all areas and prevent the accumulation of surface water ponds.

6.14. Construction of Buildings

Buildings and structures shall be constructed based on the Building Code by BEZA. Apart from that, preliminary soil testing, Optimum Moisture Content, Optimum Density Content Analysis, Procter Test, Load Bearing Capacity testing must be done before initiating with the foundation and footings.

6.15. Cumulative Impact Assessment

DBL would house ten industries of various types. It would take a long time before the full operation of all industries begin. When new industries start their operation, additional impacts may result from these operation processes. Even small impacts from the individual industry can add up and increase the cumulative effects. There is only one power plant in the vicinity of the project area, which could add to the pollution and environmental impacts, although the industry is nearly 2 km away from the project location and the impact from this industry will be quite insignificant. For any environmental monitoring and management system effects of all the industries inside and outside the DBL area need to be considered. Proper environmental management plan should be prepared and followed to avoid, mitigate, or reduce the impacts resulted from cumulative effects of all industries.

7. Public Consultation and Disclosure

7.1. Introduction

This section provides the stakeholder identification and analysis as well as a brief understanding of the engagement process for the project. “Stakeholder” refers to those who have reasonable stake in the environmental/social impacts of the project or activity are ascertained with a view to taking into account all the material concerns in the project or activity design as appropriate. It is highly desirable for all key stakeholders to arrive at a consensus on sensitive features, impacts and remedial actions. Stakeholder identification was done by examining the potential impacts of the project in terms of:

- Which agencies might have responsibility for the impact management;
- Which other organizations might have an interest in monitoring proponent activities or have local knowledge to contribute; and
- Which private/non-government sector entities might face financial and social hardships if the predicted impacts occur

The stakeholders identified in the project comprise of project impacted people who lost their land and associated amenities, project beneficiaries, various government officials etc.

7.2. Objectives of Public Consultation & Disclosure

The main objective of the consultation process is to minimize negative impacts of the project and to maximize the benefits from the project to the local populace. The objectives of public consultation as part of this project are:

- Promote public awareness and improve understanding of the potential impacts of proposed projects
- Identify alternative sites or designs, and mitigation measures
- Solicit the views of affected communities / individuals on environmental and social problems
- Improve environmental and social soundness
- Clarify values and trade-offs associated with the different alternatives
- Identify contentious local issues which might jeopardise the implementation of the project
- Establish transparent procedures for carrying out proposed works
- Inform the affected populace about the entitlement framework and to settle problems with mutual consent
- Create accountability and sense of local ownership during project implementation; and
- To obtain information on baseline environment

7.3. Approach and Methodology

Different techniques of consultation with stakeholders were used during project preparation, viz., in-depth interviews, public meetings, group discussions etc. to understand the socio-economic profile of the community, baseline environment, their concerns etc. In this regard, Focussed Group Discussion (FGD) was conducted with different group at the Proposed Site. Various institutional stakeholders like Forest Department, Fishery Department, Department of Meteorology, Department of Agriculture, Department of Livestock etc. were also consulted during the study for collection of baseline information various environmental components and to seek their suggestion about the proposed project.

7.4. Consultation and Disclosure Meeting

Types of consultations conducted with various participants using various tools including, interviews with government officials, focused group discussion etc. are presented in the table below.

Table 38: Type of Consultations

S. No	Type of Stakeholders	Key Participants
1	Institutional Stakeholders	- Deputy Commissioner office - Forest Department - Fishery Department - Department of Meteorology - Bangladesh Water Development Board - Department of Statistics - Upazila Agricultural Office - Upazila Livestock Office
2	Community	- Potentially local residents - Local women - Local youths

7.4.1. Consultation with Institutional Stakeholders

Consulted Officials

Name of Person	Designation	Department	Date of Consultation
Mr. Shariful Islam	Upazial Nirbahi Officer	Moulvibazar Sadar Upzaila	27-11-2019
Mr. Motaher Billah	Upazila Education Officer	Moulvibazar Sadar Upzaila	27-11-2019
Mohammad Ali	Office Administrative Officer	Moulvibazar Sadar Upzaila	27-11-2019
Mr Habibur Rahman	Kanungo	LA office, Moulvibazar District	09-01-2020
Mr Sonjoy kumar shingho	Surveyor	LA office, Moulvibazar District	09-01-2020
Mr Naser Uddin	Office Admin	LA office, Moulvibazar District	09-01-2020
SM Sazzad Hossain	Divisional Forest Officer	Forest Divisional, Sylhet	13-01-2020

Name of Person	Designation	Department	Date of Consultation
Mr Gias Uddin	System Anylist	Department of Meotrology, Dhaka	07-01-2020
Mr Mohiuddin	System Anylsit	Hydrology Department, BWDB	06-1-2020

Salient points of Consultation

Discussions were held on various developmental aspects of the proposed EZ like environmental and social issues. The discussion was concluded by a visit to the project site. Some of the key features discussed were as follows:

Department of Forest

- The Proposed Site (area covering 10 Km radius of proposed site) is located out of forest zone. Divisional Forest Officer stated that the proposed area is devoid of forest zone and Luachara is the main forest in Moulvibazar District which located at about 35 km distance from the site.
- There is no protected area or Ecologically Critical Area located within the project area

Department of Meteorology

- Department of Meteorology provided us with long term meteorological data pertaining to the site from the Sreemangal station

Bangladesh Water Development Board

- Bangladesh Water Development Board provided us with the Recorded Highest Water Level Data of Kushiara River
- Since the proposed area is near the Kushiara River, the existing embankment of the Kushiara River may be renovated to resist flash flood which occurs in the area.

Department of Education

According to Upazila Education Offcier, the literacy rate is increasing day by day in the Moulvibazar Sadar Upazila. He added that, 10 years ago female literacy rate was low than male; but now it is above male literacy rate. literacy rate at Khlilpur union is low. The project is expected to generate employment for the local population which will reduce the unemployment and poverty in the area resulting in less dependency on earnings from school going age children.

Land Administration office – Moulvi Bazaar

The land for the proposed EZ was acquired by DC for BEZA. However, many of the PAPs who lost their land are yet to be compensated on account of lack of land records and conflict in ownership. The LA office advised the project proponent to investigate the matter towards a resolution for disbursement of compensation. The LA office also suggested to prioritize the project affected households for the employment in the proposed EZ.

Figure 36: Consultation with Institutional Stakeholders



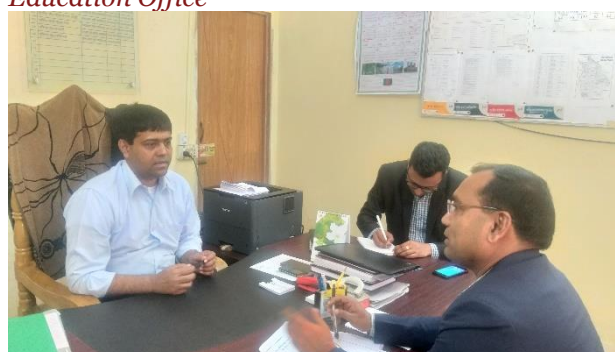
Consultation in Sylhet Divisional Forest Office



Consultation with Moulvibazar sadarUpazila Education Office



Consultation meeting in Department of Environment, Sylhet



Consutation meeting with Department of Agriculture and extension, Moulvibazar

7.4.2. Consultation with Community

Number of consultation exercises with local community was conducted during the process of ESIA preparation. The stakeholders consulted include local People, community in the vicinity of project area, local women community, fishermen, youths etc. The details of consultations held with issues raised or discussed and suggestions provided by the respective stakeholders are presented in below

Table 39: Details of Public Consultation and Disclosure Meetings

Relevant Stakeholders	Issues	Suggestion/Demand from participants	Remarks
Local Youth Group of adjacent residential settlements	• Employment opportunity & Priority for local population • Skills training to enhance the competency	• Welcomed by the youth group, the industrial set-up at the Economic Zone proposed shall provide them with employment opportunities. • Skill enhancement training should be given to youth group by industries so that they can get job. There will be requirement of several workers like casual labours, masons,	• Employment opportunities to the local youths should be offered on a priority • Interest specific trainings should be provided to the youths putting up within close proximity of the subject site. The training modules should be

Relevant Stakeholders	Issues	Suggestion/Demand from participants	Remarks
		carpenters, joiners, electricians and plumbers etc. Apart from casual labour, semi-skilled and unskilled labour and formal employees are also expected to get employment during the period of construction and industrial operation.	customised based on the requirement and the interest of the stakeholders
Local Farmer Groupz, adjacent residential settlements	• Priority basis employment opportunities for affected farmer • Loss of livelihood/employment opportunities	• Although Many of farmers of adjacent residential settlements lost agricultural land for the land acquisition by the BEZA, they welcomed the project. The affected farmers are believed that should get preference in job opportunities in the zone. • In the consultation, the affected farmers raised a concern that there is a power plant and a gas field nearby; those projects did not provide employment to any local people.	• Required skill development training shall be given to locals and Employment to the locals should be offered on a priority basis.
Women Group of adjacent residential settlements	• Equal opportunity to get employment • Social Safety	• Women community should get equal opportunity like the men to get involved in the developmental activities of EZ • They should also get an opportunity to learn, get trained and work during construction, various developmental activities of EZ and operation of industries. • The safety and security of the people especially the women should be assured. There will be influx of migrant labours during the activities of EZ; hence safety and security must be ensured.	• Women should be provided with equal opportunities • Safety of the women population from the migrant workers and others will be of the utmost priority. Male and female police should be deployed to do patrolling when the activities begin in the EZ

Figure 37: Consultation with Local Stakeholders



Stakeholders consultation meeting with local farmer, Youth and elite group



Stakeholders consultation meeting with local farmer, Youth and elite group



Consultation with local people



Consultation meeting with Local UP Chairman

8. Environmental Management Plan and Monitoring Indicators

8.1. Introduction

This section outlines the suggestive mitigation measures, monitoring and management responsibilities during the construction, and operational phases of the project.

The purpose of EMP is to:

- List all suggested mitigation measures and control technologies, safeguards identified on generic understanding of the impacts;
- Provide an institutional mechanism with well-defined roles and responsibilities for ensuring that measures identified in ESIA designed to mitigate potentially adverse impacts, are implemented;
- Provide project monitoring program for effective implementation of the mitigation measures and ascertain efficacy of the environmental management and risk control systems in place; and
- Assist in ensuring compliance with all relevant legislations at local and national level for the Project.

The EMP will reduce adverse environmental impacts and help the project proponent in complying with environmental standards and regulations of the Department of Environment, Bangladesh.

8.2. Mitigation Plan

8.2.1. Preconstruction Operations

Selection of Contractor for Construction

A Site Specific EMP (SEMP) should be prepared by the contractor before commencement of construction. This should be included in the EMP.

Cut and fill operations: As mentioned earlier DBL Industrial Park Limited has assigned a third-party vendor to provide land filling materials for construction. Relevant documents are attached in **Appendix G**.

8.2.2. Construction Activity

The following are the major construction activities:

- Boundary Wall Construction
- Road, Footpath and Master drainage line construction
- Administrative & residential building
- Development of water supply, Electricity supply and Gas supply network

- Development of sewer system network
- Development of STPs, RMS Gas station, Mini Fire Office, Water body

BEZA will ensure the establishment and operation of mini fire office under its capacity.

The impacts associated with construction of road network, civil work, boundary wall, building, utility supply & sewage network along with proposed mitigation measures are given below. The Contractor shall ensure all mitigation and enhancement measures (including those related to mitigation of air/noise/water pollution; drainage/traffic congestion) as tabulated below.

Table 40: Environmental Impacts and Mitigation Plan

Impact	Mitigation Measures
Setting up of construction camps/labour camps	• The construction camps should be at least 500 m distance from habitations from the nearest settlements to avoid conflicts and stress over the infrastructure facilities with the local community. • Location for stockyards for construction materials will be identified at least 1 km from water sources • The living accommodation and ancillary facilities for labour shall be erected and maintained to standards and scales approved by the resident engineer • All sites used for camps will be adequately drained. There should not be any risk of periodic flooding, nor located within 300 feet of pools, sink holes or other surface collections of water • The camps will be located such that the drainage from and through the camps will not endanger any domestic or public water supply • All sites will be graded, ditched and rendered free from depressions such that water may get stagnant and become a nuisance • Construction camps shall be provided with sanitary latrines (1 per 25 pax), bathing facility and urinals. • Sanitary latrines shall be under cover and so partitioned off as to secure privacy, and shall have a proper door and fastenings • Adequate and suitable facilities for washing clothes and utensils shall be provided and maintained for the use of contract labour employed therein. • Sewerage drains will be provided for the flow of used water outside the camp. • Drains and ditches will be treated with bleaching powder on a regular basis. • The sewage system for the camp will be properly designed, built and operated so that no health hazard occurs and no pollution to the air, ground or adjacent watercourses takes place. • Clean potable drinking water facility should be provided at the site and the water quality should be monitored regularly • Crèche facility should be provided for children if female workers are employed • First aid facilities should be made available at construction camp. First aid box should contain small, medium and large sized sterilized dressings, sterilized burns dressings, 2 % alcoholic solution of iodine, bottle containing sal volatile, snakebite lancet, , bottle

Impact	Mitigation Measures
	of potassium permanganate crystals, scissors, Ointment for burns & surgical antiseptic solution • 1 first aid box should be available per 50 labour • A person trained in first-aid treatment should be made in charge who will always be readily available during emergency • A suitable motor transport shall be kept readily available to carry injured or ill person to the nearest hospital.
Landfilling	• Residential facility or sensitive facilities like hospitals, schools etc. shall not be located in downwind direction of the identified sites for getting landfilling material. • The soil used for landfilling should have similar characteristics to the native soil and free of any type of contamination. • Ensure that filling material must be tested by the third party vendor to check for top soil contamination.
Soil Erosion and Sedimentation control	• Contractor should plan the activities so that no loose earth surface is left out before the onset of monsoon. • Top soil along the road side should be stripped and kept under covered shed for plantation • After the construction activity is over, top soil will be utilized for landscaping activity. • To avoid soil compaction along the transportation routes, only identified haul roads would be used for transportation. • Turfing of low embankments and plantation of grasses and shrubs should be done in slope stabilization. • Soil erosion checking measures as the formation of sediment basins, slope drains, etc., should be carried out.
Disposal of Debris and any waste generated	• Waste from construction camp should be segregated at site. Food/wet waste should be composted in pit at the site, recyclable should be send to recyclers if any and rejected waste should be disposed regularly through responsible agency in the area • Dustbins should be provided at the site and construction camps to prevent littering of waste • Storage area of minimum 2 days should be provided at construction camp for storage of the waste generated from labour camps • Construction debris should also be segregated at the site. This debris should be used for filling to the extent possible. Recyclable waste should be sold in the local markets and reject waste should be sent to the identified debris disposal site • All arrangement for transportation during construction including provision, maintenance, dismantling and clearing debris, where necessary will be considered incidental. • Construction debris should be stored under covered sheds on paved surfaces to prevent leaching • Utmost care shall be taken to ensure safe collection, transport and disposal of construction waste and debris.
Dust Generation & Air Emission	• Vehicles delivering materials should be covered with tarpaulin to reduce spills and dust blowing off the load.

Impact	Mitigation Measures
	• Compaction of prepared site to re-strain the fugitive emissions. • Water should be sprayed in the cement and earth mixing sites as well as after compaction. • In high dust areas, workers should be provided and encouraged to use masks. • Regular maintenance, servicing of the vehicles and periodic emission check for equipment and machinery would be carried out in conformity with Schedule 6 – ‘Standards for Emission from Motor’ of The Environment Conservation Rules 1997 (Amended 2002); • Water to be sprayed on the haul road. • All the vehicles entering the project site will be checked for Pollution-Under-Control Certificates. • Air quality monitoring to be carried out during construction phase to check the pollutants level in the air
Procurement & Setting up of Crushers, Hot-mix plants, other Vehicles, Equipment and Machinery	• Specifications of crushers, hot mix plants and batching plants, other Construction Vehicles, Equipment and Machinery to be procured should comply to the DoE Standards/ norms • Adequate stack height and emission control devices such as bag house filters, cyclone separators, water scrubbers etc., should be attached • Impervious platform for storage of bituminous and other liquid hazardous chemical should be provided • Pollution control measures for Diesel Generator (DG) set i.e. stack height, acoustic enclosure etc. to be ensured • Provision of readily available first aid kit, firefighting equipments at the plant site at appropriate location to respond in case of accident. • Periodical monitoring of air quality and noise levels as per conditions stipulated under the statutory clearance from DoE. Whenever the emission exceeds the permissible level the plants should be stopped and necessary repairing works of faults should be done to bring down the emission levels
Contamination of soil	• Impervious platform and oil and grease trap for collection of spillage from construction equipment vehicle maintenance platform will be appropriately provided at construction camp, servicing area and liquid fuel and lubes at storage areas. • Proper management of waste from labour camps and construction site • Proper disposal of wastewater generated from labour camp and construction site
Contamination of surface & ground water	• Car washing / workshops near water bodies will be avoided. • If possible, avoid excavation during monsoon season • Loosened soil will be stabilized by Contractor through landscaping and developing vegetation, wherever possible, once construction activity is completed at any site. • Sanitation facility with septic tank followed by soak pit to be developed. Toilets should be constructed on site during construction phase and the waste water would be channelized to the septic tanks and soak pits in order to prevent waste water to enter into the water bodies. • Provision of oil & grease traps upstream of storm water drains should be kept

Impact	Mitigation Measures
	• Surface run off due to construction activity should not be discharged in open without treatment
Loss of water bodies/ surface ground /	• No excavation should be carried out from the bund of the water bodies. • No debris disposal near any water body. • Prior written permission from authorities is required for use of water for construction activity. • Construction labours to be restricted from polluting the source or misusing the source. • Labour camps should be located away from water bodies.
Drainage and runoff	• The Contractor would always clear all the cross drainage structures and natural drainage before onset of monsoon in order to keep all drainage unblocked Earth, stones, wastes and spoils will be properly disposed off, to avoid blockage of any drainage channel. • All necessary precautions should be taken to construct temporary or permanent devices to prevent inundation or ponding.
Noise from Vehicles, Plants and Equipment	• Construction activities carried out in the daytime only is preferred. • The construction equipment would be provided with adequate noise control measures and should comply with the noise standards as prescribed by DoE • Regular maintenance of vehicles and equipment would be carried out and corrective action taken in case of any deviation. • Ear muff/ear plug should be given to the workers working around or operating plant and machinery emitting high noise levels. • DG sets if installed should be provided with acoustic enclosures • Labour working in noise prone area should be provided with ear plugs and job rotation should be practiced to prevent the prolonged exposure of any workers to high noise levels
Loss or damage to vegetation Loss, damage or disruption to fauna	The site is devoid of any vegetation. Hence no impact pertaining to loss of vegetation cover and associated biodiversity is anticipated. However, plantation to be carried out in order to improve the quality of neighbouring environment. The plantation will act as habitat for various type of avifaunal, insects, smaller mammal, reptilian species. Construction workers will be directed not to disrupt or damage the flora and fauna.
Accidents	• Safety officer should be appointed at site to ensure all the safety guidelines are being followed at site • Cautionary guidance should be provided at site to aware people about the associated risk with the area. Entry to the fuel storage room or machinery operation room should be restricted only to authorized trainer personnel • All Accidents should be reported immediately and incident analysis, preventive measures shall be implemented.
Clearing of Construction of Camps & Restoration	• Contractors should prepare site restoration plans. The plans shall be implemented prior to demobilization.

Impact	Mitigation Measures
	On completion of works, all temporary structures shall be cleared, all rubbish burnt, excreta or other disposal pits or trenches filled in and sealed and the site left clean and tidy.
Occupational Health & Safety Plan	- All construction worker should wear PPEs including safety jacket, helmet, gloves, gum boots, ear plugs, mask while working at the site - Workers should be made aware about the health issues related with open defecation - Training to workers should be provided for handling the construction equipment and machinery - Training to the workers should be provided to handle the emergency situations like fire, floods etc. - First aid facility and sufficient nos. of trained personnel should be available at all the time at construction camp - Cautionary signage and notice should be displayed in local language and English at the required places like fuel storage area so that hazards can be avoided. A security guard should be deputed in these areas and entry should be restricted
Disaster Management	Precaution will be taken to prevent danger of the workers and the public from fire, flood, drowning, etc. All necessary steps will be taken for prompt first aid treatment of all injuries likely to be sustained during the course of work.

8.2.3. Mitigation Plan Suggested to Individual Industries

Individual Industries should obtain environment clearance individually from DoE prior to establishment and commencement and conditions stipulated in environmental clearance certificate should be complied by individual industries.

Indicative mitigation measures that should be taken by individual industry owners during development and operation phase of respective industries is tabulated in table below.

Table 41: Mitigation Measures Suggested for Individual Industries

Impact	Mitigation Measures During Construction Phase	Mitigation Measures During Operation Phase
Air Pollution	- Sprinkling of water during construction phase on all unpaved roads, site and haul roads - Avoiding excess pilling of raw material and debris at site - Storage & transportation of raw material and debris in covered conditions - Regular cleaning of site - Provision of adequate parking space at site so as to prevent idling of vehicles during construction phase - Up keeping and maintenance of all the construction vehicles, machinery and equipment used for construction purpose - Guiding signage should be provided at the site for vehicles entering the site to	- Installation of air pollution control devices like Electro-static precipitator, bag filters, separators, cyclones, multi-level condensers & evaporators, scrubbers, quenchers, stacks of height as per DoE norms - Disposal of the waste material at the designated site for waste disposal in covered condition - All the roads within the plot should be paved & water sprinkling should be practiced to minimize dust generation. - Adequate stack height should be provided for dispersion of the emissions

Impact	Mitigation Measures During Construction Phase	Mitigation Measures During Operation Phase
	- minimize the movement of vehicle within the site • Timings of the construction material vehicles should be fixed and should be during non-peak hours to prevent traffic congestion and traffic jams • Construction vehicles should follow the speed limits as set up for EZ zone • Open burning of wood or any other material should be prohibited at site and all the workers should be made aware about the same	• Chemicals having potential to release VOCs should be stored, handled and used in closed system • Quarterly monitoring should be carried out for testing ambient air quality • Development of thick green belt of 10 m width all along the industrial plot periphery
Water Pollution & water Conservation	• Minimizing the run-off from the site by construction of temporary storm water drainage, sediment basins for collection of storm run-off and re-using that water for curing purpose and wheel washing • Curing of structures to be done by spraying and during early morning and evening hours only to minimize the water requirement • Maintaining the flow of water sprinklers so as to avoid wastage of water and ponding of water • No debris should be thrown or disposed off in any water body like river, pond, canal etc. or ground water source like functional or abandoned well • Excavation should not be carried out during monsoon • Excavated pits should be provided with garland drains to prevent entrance of water inside the pit • Provision of septic tanks and soak pits at the site for disposal of sewage generated by construction labour • Waste generated during construction should be disposed off regularly at the identified site for debris disposal	• Separation of the effluent streams depending on the nature of pollutants and connecting it to EZ's sewage/effluent network • Monitoring the quality of sewage, treated water, drinking water quality and ground water quality regularly • Tank alarms should be installed so as to prevent idle running of pumps • Provision of storm water drainage system at site and it should be connected to rain water harvesting system. Storm water drains should also be connected to storm water drainage of EZ • Provision of rain water harvesting system so that water can be collected and used to meet daily water demand. • Provision of oil & grease traps with the storm water drains draining the parking and fuel storage area • Untreated effluent should not be discharged in open • No hazardous waste, municipal waste, industrial waste should be disposed off in the water bodies or in ground • Leachates, if any or untreated sewage should be stored only in lined ponds to prevent contamination of ground water
Soil Quality	• Top soil, if excavated from the project site should be stored in covered condition and should be used later for landscaping purpose • Storage of raw materials, debris and fuel on paved surfaces • Training the workers to handle the material so as to minimize spillage of material on soil	• All industries should use best technologies for optimal utilization of the raw material and re-use & recycling of waste material in the process to reduce waste generation as well as raw material demand for the project.

Impact	Mitigation Measures During Construction Phase	Mitigation Measures During Operation Phase
	• Disposal of construction debris, municipal waste and hazardous waste at designated sites	• All industries should be responsible for management of the solid and hazardous waste generated from their plots. Industries should be liable to pay penalty in case of noncompliance of conditions laid down by DoE • It should be mandatory for all industries to provide storages for different category waste, its processing and safe disposal. Options for composting of compostable waste, segregation and selling recyclable waste should be opted • Waste storage area should be paved surfaces and covered • No open area should be left without the vegetation to protect the soil. • Hazardous Waste should be stored in designated area and should be disposed as per the best industrial practice.
Noise Pollution	• Construction vehicles, machinery and equipment used for construction purpose should meet the standards prescribed by DoE • Up keeping and regular maintenance of all the construction vehicles, machinery and equipment used for construction purpose • Speed limits should be restricted for all construction vehicles and equipment • Honking should be prohibited at the site • Provision of acoustic enclosures, noise mufflers, silencers etc. with the DG sets and any noise generating machinery • Provision of temporary noise shield/barrier in areas where more noise will be generated	• Usage of machineries of modern make and adoption of latest available technology which compiles to noise levels standards laid by DoE • Provision of personal protective equipment to workers exposed to noisy operations. Audiometric tests should be carried out for workers exposed to high noise levels. Job rotation should be practiced to prevent continual exposure. • Noise levels in industries should be monitored regularly using noise meters. • Minimal usage of horns within industrial plot. • Regular maintenance of vehicles & construction machinery involved in industrial operation • Noisy operation should be taken up in covered conditions so that no disturbance due to noise is caused • Thick green belt should be developed within each industrial plot that will act as noise barrier.
Ecology	• Plantation should be carried out within individual industrial plots • Native plant species should be considered for plantation	• Green belt of minimum 10 m thickness should be developed all along the periphery of the industrial plot

Impact	Mitigation Measures During Construction Phase	Mitigation Measures During Operation Phase
	• Timber should be purchased only from authorized vendors	• Native plant species requiring should be considered for plantation
Socio-economy and aesthetics	• All proposed air, water, noise and soil pollution control measures should be taken • Provision of employment opportunity during construction phase to local people • Provision of personal protective equipment to all the workers • Job rotation should be practiced for workers exposed to high noise levels • Site should be covered from all the site during construction phase • Drinking water facility, adequate nos. of toilet, septic tank/soak pit, bathing facility, lighting should be provided for construction labour • Storm water drainage system should also be provided at site to prevent water ponding and breeding of mosquitoes	• Providing employment to local people preferably • Adoption of adequate air, noise, soil and water quality measures
Disaster and Risk Management	• Provision of first aid kit and first aid room and well trained first aid practitioner at the site all the time • Ambulance facility should be provided at the site • Tie-ups with local hospital should be made to handling emergency case, if any • Availability of safety officers and supervisors at all the time on the site • Workers should be given training for handling construction vehicles, equipment and handling emergency situations like fire, floods, earthquake and cyclone • Cautionary signage should be provided in the areas associated with risks like storage of explosives, fuels, heavy construction material etc. Entry for only trained authorized personnel should be allowed in such areas with adequate safety measures • Emergency handling cell & room should be developed at the site and should be headed by project & safety manager • Contact no. of nearest fire-station and hospitals should be displayed within the emergency handling room	• Provision of first aid kits at the site • Tie-ups with local hospital should be made to handling emergency case, if any • Regular medical check-ups of the employees • Training should be given to workers for handling the equipment and managing emergency situations • Material safety data sheets of chemicals to be used should be displayed on local languages at work station • Provision of personal protective equipment to the workers as per requirement • Cautionary signage should be provided in the areas associated with risks like storage of chemicals, explosives, fuels etc. Entry for only trained authorized personnel should be allowed in such areas with adequate safety measures

8.3. Enhancement Plan

The proposed project involves development of EZ and ancilliary facilities for the upcoming EZ. Development of the EZ will attract the investors and make the proposed site location more accessible for trading and business. Proximity of the proposed project site to the Dhaka Sylhet Highway and an already existing inland water transportation system further adds to the suitability of site for setting up the industries. As enhancement plan, it is proposed that DBL Industrial Park Limited should develop green areas in the EZ site, proper storm water drainage to prevent flooding and rainwater harvesting system to harvest rainwater and use it to meet daily water demand and reduce pressure on ground water resources.

8.3.1. Greenbelt Development

Development of a greenbelt will be strictly mandatory and green coverings along the internal roads and open areas will be beneficial. Provision for approximately 49.04 acres of area (29.26 % of total EZ area) within proposed EZ has been kept for developing Green & Open area. DBL Industrial Park Limited would adopt a Green Belt Development Plan, which would be prepared by experts having proven competence in landscaping and tree plantation. The greenbelt development plan should be implemented throughout the project cycle and should be monitored to ensure adherence to the plan. The tree plantation will have the following objectives:

- restoration of green cover in the project area
- restoration/preservation of genetic diversity
- prevention from dust
- attenuation of noise pollution from EZ to surroundings
- creation of aesthetic environment

At least three rows of trees may be planted along the boundary. Later, new trees can be planted to make up the gaps devoid of trees. The selection of trees and plants for greenbelt/tree plantation should be those which could grow in the existing agro climatic conditions. They should be able to survive in the local soil conditions.

Based on the above considerations, the plant species should be native in nature. The selected plant species would need minimum level of maintenance including fertilisation and other soil amelioration. Apart from trees, the shrubs and other herbaceous species may also be planted in between the trees along the boundary wall. This will act as green cover, prevent soil erosion by increasing the binding capacity of the soil, and importantly act as noise barrier together with trees.

8.3.2. Process wastewater

It is proposed to develop the Effluent Treatment Plants by the individual industries and Sewage Treatment Plants (STPs) to treat the effluent waste water, sewage from the industrial units, residential complexes, offices etc. It is proposed that effluent from industrial units and sewage from industrial units and other facilities shall be directed to STPs. Post treatment from the ETPs and STPs, the effluent water shall be analysed and compared as per the regulatory standards of ECR, 1997. The Sludge generated from STP shall be dried using a filter-press and the dried sludge could be used as manure.

The area of the ETP is 1150 m². It has lifting tank, storage tank, neutralization system, biological oxidation, clarifier feeding tank, return sludge tank, sludge thickener and dissolved oxygen increase system. The capacity of the storage tank is 1217.2 m³ and the biological oxidation system can process 4808.8 m³ volume of water.

8.3.3. Drainage and Rainwater Harvesting

Based on the site gradient, the drainage pattern has been decided. It is planned to establish the drain along the periphery and along the sides of the proposed road network and is finally discharging into the existing body. It has been planned to discharge the flow of the internal drain into suitable discharge points.

- The drainage system is planned to cater for the entire EZ through gravity flow.
- Drains are proposed to be provided on both sides of the roads and along the periphery.
- Master drainage system has been designed through RCC Circular pipe along the periphery.
- Covered rectangular brick masonry drain along the sides of the proposed road network is considered for the remaining areas for optimization of area under drainage.
- RCC box / pipe culverts of suitable sizes are considered for road crossings.
- Provision for Rainwater harvesting structures are envisaged for each plot.

8.3.4. Planting solar panels

To minimize the dependency on non-renewable sources of energy, DBL Industrial Park Limited should take initiative and take a step towards green energy. If feasible, solar panels can be installed to light up the structures to be resurrected on the roof tops of the buildings. The solar panels can also be used for streetlights, to light up the buildings, geysers etc.

8.3.5. Community development plan

It is recommended the EZ owners to involve the local community during the project development. The EZ authority/its contractors/industrial units may recruit local workforce to the extent possible during construction and operation phase. The authority would identify technically qualified unemployed youth around the project location and other nearby areas and employ as far as practical. The EZ authority should form a forum/ association/ trust along with its industrial units to look after community development activities of EZ. All the industrial units should periodically contribute to this Trust. The Trust would represent EZ and its industries for all matters related to community and its development. This would act as interface between EZ and community. The Trust should encourage its industrial units to recruit local unemployed youth in the jobs during operational phase. For this if required arrange training for the local people to develop skilled manpower required if sufficient skilled manpower is not available to carry out technical work in the industrial units during operational phase.

The Trust will organise a community advisory group involving local representatives, representatives from EZ industries; that would help them in finding ways to participate with its neighbours in addressing socio-economic concerns. With the advice of its community advisory panel, local officials,

and other key individuals and groups, the Trust along with its constituent industries may sponsor appropriate programs and projects to benefit its community as a whole.

Some specific community development programs that could be considered by the Trust in the locality are suggested here:

- Conducting awareness programs in surrounding villages on health impacts due to environmental pollution (air, noise, water, solid waste, etc.), and precautions to be taken to minimise health impacts.
- Conducting periodic health check-ups to the EZ (including industries) staff and in the surrounding villages to identify pollution related diseases.
- Encouragement to residents in the nearby localities for self-employment ventures, such as by assisting them in arranging micro finances to develop them as artisans/ skilled personnel.
- Periodic training programs on health and sanitary education, women and child development, and income generation schemes.
- Participation in improving the existing medical and educational facilities of the area - for this purpose, it is suggested that the Trust provide funds for facilities improvement (providing toilets, furniture, additional space creation, any other needed) to the local hospitals and schools as per the need
- Development of greenbelt/greenery or tree plantation in the nearby vacant government lands to build a green and clean environment in the surrounding areas and to reduce pollution impacts to some extent.
- Sponsoring fellowships to students in surrounding villages to encourage them to go for higher education
- Conduct or sponsor camps to clean upriver ghats, jetties and terminals in the surrounding areas.

8.4. Contingency Plan (Emergency Preparedness Plan)

In order to be in a state of readiness to face adverse effects of accidents, an emergency preparedness plan is required to be prepared which includes on-site and off-site emergency plan by the individual industry and industrial estate. DBL Industrial Park Limited is committed to develop an emergency preparedness plan in consultation with district authorities and industry association.

The Emergency Preparedness Plan will have the following minimal components:

- Accidents preventions procedures/ measures
- Fire prevention planning and measures
- Fire water storage and foam system
- Accident/emergency response planning procedure
- Grievance redress mechanism
- Emergency control centre
- Emergency information system with role & responsibility and command structure
- Recovery procedure
- Assessment of damages and rectification

- Evaluation of functioning of disaster management plan
- Accident investigation
- Clean-up and restoration

DBL will adopt a detail Emergency Response and Disaster Management Plan, which is to be prepared by respective professional expert.

8.5. Institutional Arrangement

It is recommended that the EZ Authority set up an E&SMC (Environmental & Social Management Cell) to address environmental management concerns. The cell should be manned by qualified persons who will be responsible for regular environmental quality monitoring, proper functioning of STP, implementation of community development plan, and liaison with regulatory bodies such as DoE. BEZA has developed Environmental and Social Management Framework. The institutional arrangement and Environmental Management Plan of DBL Industrial Park Limited shall be aligned as per this framework.

Overall Project Implementation Arrangements

The overall management of the project will be carried out by DBL Industrial Park Limited which is the project implementing unit (PIU). The organogram of the PIU is provided in **Appendix I**.

Environmental & Social Management position (E&S Management Cell)

It is recommended that the DBL Industrial Park Limited set up an E&S position (E&S specialist) under PIU to address environmental management concerns. The cell should be manned by qualified persons who will be responsible for regular environmental quality monitoring, proper functioning of STP, implementation of community development plan, and liaison with regulatory bodies such as DoE.

The E&S specialist will be responsible for the following:

- Supervise implementation of EMP throughout project implementation period
- to implement the Environment Health and Safety (EHS) policy of EZ
- to coordinate with EZ Trust in relevant activities
- to ensure that STP function properly and meet effluent discharge standards
- to conduct environmental quality analysis for air, noise, water and soil samples on a regular basis
- to implement community development plan
- to coordinate and monitor EZ Trust to regularly check workers health and take appropriate steps
- to coordinate and monitor EZ Trust for safety conditions at various work environments and take necessary steps to maintain high safety standards
- To deal with emergency situations
- to liaison with regulatory bodies
- to ensure systematic and routine housekeeping of the common areas of EZ
- to maintain the proposed greenbelt along the boundary
- Supervise EMP implementation work of contractor and individual industries
- Ensure integration EMP measures into the sub-project design and implementation plans such as contract documents, maintenance contracts, tenant lease agreements, etc.

- Supervise the implementation of the mitigation measures by the Master developers / Contractors/individual industries
- Assist the engineering staff and other PIU staff in addressing environmental issues during planning, design and implementation of the sub-projects
- Prepare periodic progress reports on the implementation of the EMP throughout the project period

The E&S specialist may be an Assistant Director of the company, who should be a senior person, should have an overall knowledge of STP, hazardous waste and their maintenance, environmental laws and standards, and should be able to independently manage the Health and Safety. The in-charge may be supported by Environmental scientist/ engineer and a Social Analyst. The scientist will be responsible for environmental quality analysis and should be capable of preparing reports and data sheets. He/she should have sufficient knowledge in sampling and analysis of environmental parameters. The social analyst should have knowledge of community programs and should be able to plan and implement community programs. In addition a part time occupational health specialist and a safety specialist can be appointed.

In addition the following staffs are required:

- ETP, STP and treatment, storage, and disposal facility (TSDF) In-charge
- Chemists cum laboratory in charge
- Laboratory/Field Assistants
- Sampling assistants

Environment Management Unit (EMU)

In order to implement various environmental management measures at EZ, the master developer / contractor / industry operator will set up Environment Management Units (EMU) at their level. The EMUs will consist of environmental engineers with relevant experience on environmental issues associated with the development and operation of EZ. The EMU will function all through construction and operation phase of the EZ and perform the following functions.

- Identify regulatory requirements of the sub-project and initiate necessary actions / studies to ensure compliance to the same
- Co-ordinate with DoE and PIU and ensure securing Environmental Clearance Certificate (as applicable) for the project(s) from DoE
- Co-ordinate with the contractors / sub-contractors and all other agencies involved in the development and operation of EZ and ensure that all the requirements of EMP are fully complied
- Ensure that all the common environmental infrastructure in EZ is operated and maintained in compliance with the regulatory requirements of GoB
- Liaise with individual enterprise/tenants and ensure that all environmental management conditions of the tenant lease agreement are fully complied
- Carryout environmental monitoring on regular basis as recommended in the EMP
- Prepare regular reports on environment management and submit to PIU/GoB.

Capacity building program

A training program for capacity building program of DBL personnel will be arranged upon availability of required manpower. There will be environmental meeting performed in every month and will be discussed the overall performance of the environmental issues. The training will be given on the topic of Scope of the EHS Guidelines, General Environmental, Health and Safety Guideline (EHSG), Details Requirements of IFC/WBG/ADB/National Law and Regulation for EHS, Guidelines of IFC/WBG EHS, ADB SPS Understand for EHS Standard, etc. Initially, the target group of the training will be all the management and staffs. DBL will enhance its capacity later and provide training to consultants and contractors as well.

8.6. Monitoring Indicator

To monitor the extent of environmental impact of the proposed EZ and proposed industries, it is advised to monitor the environmental quality around the project location periodically. This section describes the environmental quality monitoring detailing number and location of sampling stations, parameters to be monitored, frequency of sampling, etc. The EZ authorities has to submit all the monitoring results to DOE, Bangladesh.

Before the start of construction activities, PM₁₀ and PM_{2.5} levels in the site is to be assessed and recorded. Since PM₁₀ and PM_{2.5} were not covered in the baseline assessment by DoE laboratory, it is important to record the pre-construction levels of these two parameters before going ahead with construction and subsequent environmental monitoring.

The physical, biological and social components which are of particular significance to the proposed project are listed below.

Table 42: Monitoring Indicators

S. No	Components	Indicative Parameters to be monitored
1	Micrometeorology	Temperature, Humidity, Rainfall, Evaporation, Wind Speed, Wind Direction, Sunshine Hours
2	Ambient Air Quality	SPM, PM ₁₀ , PM _{2.5} , SO ₂ , NO _x , CO, Pb, O ₃ , hydrocarbons etc.
3	Ambient Noise Level	Noise level during daytime and nighttime
4	Surface Water Quality	Temperature, pH, colour, DO, BOD, COD, EC, TDS, TSS, Total Hardness, Salinity, Calcium, Magnesium, Total Coliform, Fecal Coliform, Oil & Grease, ammonia, nitrates, alkalinity, Sulphate, phosphate, Fluoride, Iron, Arsenic, trace metals such as Chromium, Lead, Cadmium, Mercury etc.
5	Ground Water Quality	
6	Soil Quality	Textural class, Gravel, Sand, Silt, Clay, pH, Bulk density, Infiltration rate, Specific gravity, Porosity, Moisture content, Organic matter, Alkalinity, Sodium absorption ratio, Conductivity, Nitrogen, Phosphorous, Potassium, Boron, NaCl, Na ₂ CO ₃ , Iron, Manganese, Copper, Zinc etc.

S. No	Components	Indicative Parameters to be monitored
7	Ecological Components	Plantation success/survival rate Species richness and diversity

Quality of sewage and treated water should be monitored in the operation phase. The parameters to be monitored are the same as mentioned under ‘Surface Water Quality’ and ‘Ground Water Quality’ section in Table 40.

8.6.1.1. Air Quality

Air quality monitoring includes ambient air quality monitoring and vehicular exhaust emission monitoring. During construction and operation phase, adequate ambient air quality monitoring stations will be established at and around EZ site depending on the predominant wind directions to assess the change in ambient air quality over the time. Air monitoring stations should be established within EZ and outside based on predominant wind direction. The EZ authorities would consult DOE while deciding the exact monitoring locations. In operation phase, individual industries should also conduct regular monitoring of ambient air quality, stack emission in their respective units.

8.6.1.2. Noise Quality

Noise monitoring at adequate locations during construction and operation stage shall be conducted. Portable noise meters could be used for monitoring daytime and nighttime noise level. All the air quality monitoring locations will be covered for noise monitoring.

8.6.1.3. Surface Water & Ground Water

A notable Surface Water Body is the Khal named Gong which will receive discharges from factories in the EZ. The discharge will mostly be treated water; therefore, quality of the discharged water is not a major concern. Yet, quality should be monitored as Gong is the only major water body inside the zone. The parameters, which could be analysed in the EZ laboratories, should be analysed there. Samples could be sent to other laboratories like DOE laboratory or any Research Laboratory for analysing remaining parameters. The results of the monitoring will be sent to DOE periodically.

8.6.1.4. Soil Quality

Soil quality to be monitored at one location in EZ. Both physical and chemical parameters need to be monitored. The parameters should be compared with the soil sample of undisturbed location. The parameters to be analysed in soil sample are Textural class, Gravel, Sand, Silt, Clay, pH, Bulk density, Infiltration rate, Specific gravity, Porosity, Moisture content, Organic matter, Alkalinity, Sodium absorption ratio, Conductivity, Nitrogen, Phosphorous, Potassium, Boron, NaCl, Na₂CO₃, Iron, Manganese, Copper, Zinc etc.

8.6.1.5. Ecological Components

It is recommended to carry out a one-time assessment of baseline flora and fauna surrounding the project location before completion of the project. There after terrestrial and aquatic flora and fauna should be monitored to observe any alteration in their species composition and replacement. This could be done in association with local universities and research institutions which carry out such studies frequently. Such monitoring would help in taking necessary steps at the appropriate stage to prevent further deterioration of the surrounding ecology and protect the flora-fauna. The frequency of sampling could be once in a year during post monsoon season (Oct to Dec).

In addition, the Environment Management Cell should collect studies on flora-fauna conducted by local universities and research institutions towards assessing biodiversity of the area.

8.7. Monitoring Plan

The objective of environmental monitoring during the construction and operation phases is to compare the monitored data against the baseline condition collected during the study period to assess the effectiveness of the mitigation measures and for the protection of the surrounding environment. To monitor the extent of environmental impact of the proposed EZ and proposed industries, it is advisable to periodically monitor the ambient environmental quality around the project location. This section describes the environmental quality monitoring detailing number and location of sampling stations, parameters to be monitored, frequency of sampling, etc. The EZ authorities has to submit all the monitoring results to DoE, Bangladesh.

Online water quality monitoring system for the inlet and outlet of ETP during operations phase of the project. Moreover, grab sampling equipments for air and water quality, and noise levels are to be purchased to monitor at different locations as required.

Table 43: Environmental Monitoring Plan

S. No.	Aspect/Monitoring Indicators	Source/Nature of Impact	Monitoring Methods and Parameters	Frequency/Locations	Executing Agency	Enforcement Agency
1.0	Construction Phase					
1.1	Local Manpower Absorption	Construction Works	Contractor's report No. of people working in the project	Monthly	Contractor	DBL Industrial Park Limited
1.2	Soil Erosion	Excavation, disposal, cut & fill and land clearing activities for site levelling and internal roads, disposal	Survey & observation; Extent and degree of erosion; Structures for controlling soil erosion	Monthly	Contractor	DBL Industrial Park Limited
1.3	Greenbelt Development	-	Survival rate of species planted;	Half-yearly	DBL Industrial	DBL Industrial Park Limited

S. No.	Aspect/Monitoring Indicators	Source/Nature of Impact	Monitoring Methods and Parameters	Frequency/Locations	Executing Agency	Enforcement Agency
			Density of vegetation		Park Limited	
1.4	Air Quality	Transportation of construction materials, road construction, construction of utilities	as referred in 'Monitoring Indicator' section	Quarterly	Contractor	DBL Industrial Park Limited
1.5	Waste Management	Restoration of disposal sites and construction areas	Status of protection measures	Monthly	Contractor	DBL Industrial Park Limited
1.6	Noise Level	various construction/site preparation work	as referred in 'Monitoring Indicator' section	At high intensive area, as frequently as possible	Contractor	DBL Industrial Park Limited
1.7	Ground/Drinking Water	Accidental contamination	as referred in 'Monitoring Indicator' section	Monthly	Contractor	DBL Industrial Park Limited
1.8	Soil	Accidental contamination	as referred in 'Monitoring Indicator' section	Quarterly	Contractor	DBL Industrial Park Limited
1.9	Surface Water	Accidental Contamination	as referred in 'Monitoring Indicator' section	Quarterly	Contractor	DBL Industrial Park Limited
2.0	Operation Phase					
2.1	Micro Meteorology	Various industrial operation	as referred in 'Monitoring Indicator' section	Monthly	DBL Industrial Park Limited	DBL Industrial Park Limited
2.2	Noise Levels	Noise levels compliance with respect to industrial standards	as referred in 'Monitoring Indicator' section	Monthly	Individual Industrial Units	DBL Industrial Park Limited
			as referred in 'Monitoring Indicator' section	Monthly	DBL Industrial Park Limited	DBL Industrial Park Limited
2.3	Ambient air quality	Ambient air quality levels compliance with respect to industrial standards	as referred in 'Monitoring Indicator' section	Quarterly	DBL Industrial Park Limited	DBL Industrial Park Limited
			as referred in 'Monitoring Indicator' section	Quarterly	DBL Industrial Park Limited	DBL Industrial Park Limited

S. No.	Aspect/Monitoring Indicators	Source/Nature of Impact	Monitoring Methods and Parameters	Frequency/Locations	Executing Agency	Enforcement Agency
2.4	Drinking water quality	Contamination due to EZ operation	All physio-chemical & biological parameters	Monthly	DBL Industrial Park Limited	DBL Industrial Park Limited
2.5	Surface Water Quality	Effect of wastewater discharge	as referred in 'Monitoring Indicator' section	Monthly	DBL Industrial Park Limited	DBL Industrial Park Limited
2.6	Quality of sewage and treated wastewater	Operation of the EZ	as referred in 'Monitoring Indicator' section (surface water and ground water quality)	Monthly	DBL Industrial Park Limited	DBL Industrial Park Limited

8.8. Compensation Plan

The land over which the development has been envisaged belong to DBL Industrial Park Limited. No one is dependent on the land for livelihood purposes. There are no residential settlements present within the project area nor does the location have commercial and business set-ups. Therefore, the project does not encompass any compensation amount or compensation plan.

8.9. Grievance Redress and Stakeholder Engagement

An accessible and responsive complaint management process is important part to address any concerns pertaining to the project. A Grievances Redress Mechanism (GRM) should be put in place wherein all project stakeholders will be given a venue to lodge complaints regarding any aspect of the environmental and social concerns, hygiene, pollution, safety and any other project-related issues. The objective of Grievance Redress Mechanism would be addressing concerns of stakeholders in timebound and effective manner.

GRM system should be established by DBL Industrial Park Limited, which will be having Grievance Redress Cell (GRC) with necessary officials and systems to address various social and Environmental concerns. Grievances if any, may be submitted through various mediums, including in person meeting, in written form to EZ Office address, through a toll-free phone line or through direct calls to concerned officials, and emails. The concerns pertaining to Environmental and Social issues should be discussed with E&S Management Cell of DBL Industrial Park Limited and final verdict/action plan should be proposed by GRC. DBL Industrial Park Limited should prepare a detailed plan for GRM

To ensure active engagement of stakeholders, DBL would conduct a quarterly consultation with local communities and key stakeholders to understand their expectation and concerns towards finding path for effective and adequate resolution.

A three-member (one of them should be female) Grievance Redress Committee (GRC) should be constructed comprising of an officer representing the project proponent, not below the rank of the implementing officer, the elected member (local body) of the project area/location and one member from the public who is known to be a person of integrity, good judgment and commands respect among the community. The existence of the GRC will be disseminated to the affected persons through printed

handouts, contractor's website etc. providing details of the structure and process in redressing grievances. Particular attention should be given to the impacts on vulnerable groups. GRM and GRC will be understandable to women and vulnerable groups regardless of literacy, safely accessible to them at no costs and without retribution, transparent, and culturally appropriate. All data logged through it should be sex disaggregated. The GRC should be scaled to the risks and adverse impacts of the project.

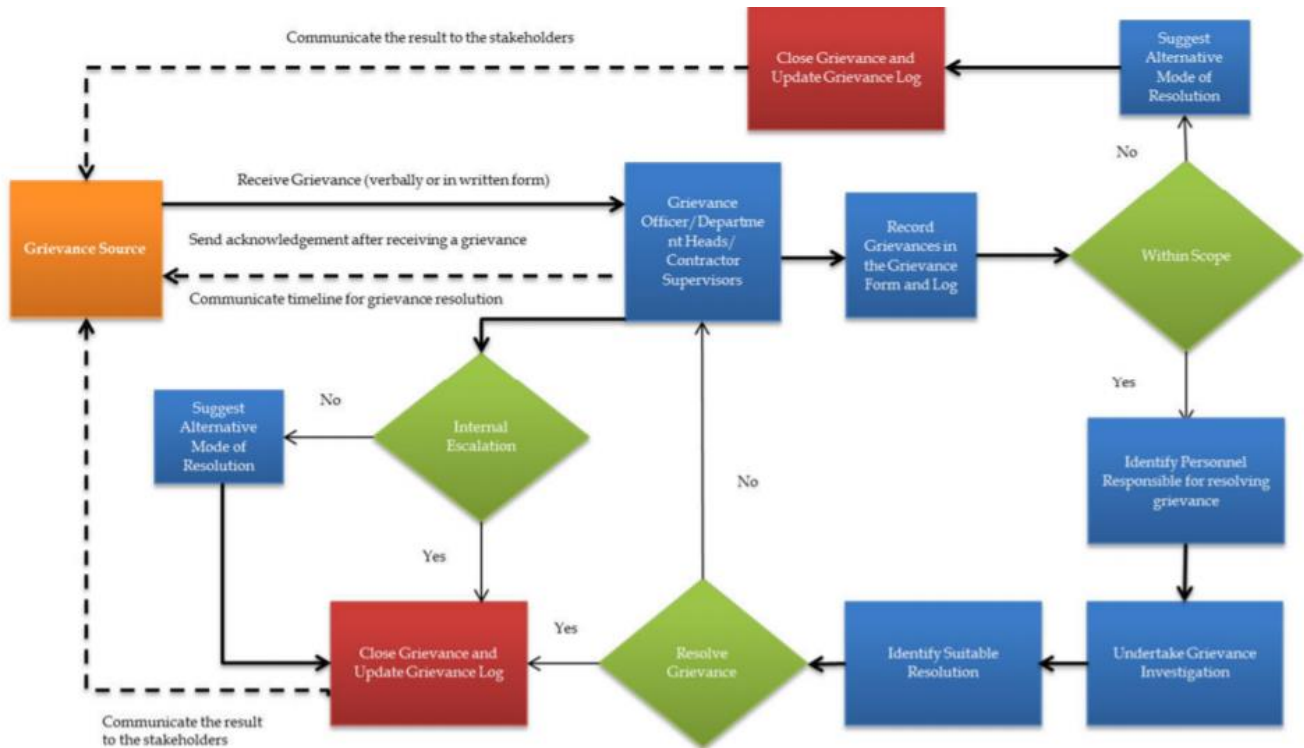


Figure 38 Grievance Redress Mechanism

The Grievance Redress Mechanism provides a platform for project-affected people to voice their grievances and facilitates the solution of problems. The Grievance source forms a verbal or written complaint to the Grievance Officer/Department Heads/Contract Supervisors who record them in the grievance form or log. If the complaint does not fall within the scope, an alternative mode of resolution is suggested. Once the alternate solution has been declared, the case is closed and is communicated with the relevant stakeholders. However, if the complaint falls within the scope, the relevant personnels responsible for resolving the grievance is identified and an investigation is undertaken. The investigation conducted helps to identify suitable resolutions to resolve the grievance. If the grievance is resolved, the case is closed and updated in the log and communicated with the stakeholders. However, if the grievance is not resolved through the investigation carried out, the Grievance Officer/Department Heads/Contract Supervisor needs to reach out to the grievance source to communicate a timeline for the resolution procedures.

8.10. Further Plans to be developed by DBL

To ensure proper EHS compliance DBL Industrial Park has to adopt following documents, which is to be prepared by respective domain experts:

1. EHS Management Plan for Construction phase
2. EHS Management Plan for Operation Phase

-
3. Emergency Response and Disaster Management Plan
 4. Greenbelt Management Plan
 5. Biodiversity and Ecosystem Impact Assessment and mitigation plan
 6. Traffic Safety Plan
 7. Plan for Grievance Redress Mechanism

9. Cost Estimation for Environmental Mitigation Measures and Monitoring

The cost of EMP given here includes only that for the STP, TSDF, laboratory/analysis facilities, certain equipment for post project monitoring and greenbelt development. The costs are approximate and need calibration at the time of detailed design and estimation stage. The cost to be incurred towards implementation of EMP by Contractor and Individual Industrial Units are not included. During construction and operation phases, the monitoring will be carried out by contractor and individual industries at individual level as applicable.

Table 44: Estimated cost for Environmental Mitigation and Monitoring

S. No	Activity/ Equipment	Cost (Tk.)	Cost (Tk)
Fixed Cost (Pre-construction and Construction Phase)			
1	Weather Station	100,000	100000
2	ETP construction	Covered under project cost	-
3	STP Construction	Covered under project cost	-
4	Greenbelt along the boundary and plantation along the roads	5000000	5000000
5	High Volume Air Samplers (2 Nos)	400000	400000
6	Digital Sound Level meter	18,000	18000
7	First time flora and fauna study	5,00,000	500000
8	Online monitoring systems for water quality	20,00,000	2000000
9	Laboratory Equipments (grab sampling equipments)	10,00,000	1000000
10	Laboratory and EHS department space and a small storage: total area 2000 sft	Cost to be considered under project cost	-
Total Fixed (Pre-construction and Construction Phase) Cost			8018000
Recurring Cost (Yearly) (Construction and Operation Phase)			
11	Ear Muffs (10 Nos only for sampling personnel)	60,000	60000
12	Solid waste bins for common areas (100 Nos)	60,000	60000
13	Periodic Ecological Study & Horticulture development	500,000	500000
14	Laboratory consumables/maintenance of instruments	100,000	100000
15	• Assistant Director – Environment	1,00,000 x 12 = 12,00,000	1200000
	• Environmental scientist/ engineer,	60,000 x 12 = 7,20,000	720000
	• Social Analyst,	50,000 x 12 = 6,00,000	600000
	• occupational health and a safety specialist,	50,000 x 12 = 6,00,000	600000
	• 2 ETP In charge	2 X 40,000 x 12 = 9,60,000	960000
	• 2 STP In charge	2 X 40,000 x 12 = 9,60,000	960000
	• One TSDF in charge	40,000 x 12 = 4,80,000	480000
	• 2 Chemist	2 X 35,000 x 12 = 8,40,000	840000
	• Laboratory/Field Assistants-6	6 X 20,000 x 12 = 1440000	1440,000
Total Recurring (Construction and Operation Phase) Cost (Yearly)			85,20,000
15	Fund for proposed community development activities	10000000	1,00,00,000

10. Emergency Response Plan and Disaster Impact Assessment

A disaster is called when following one or the more incidents occur:

- Risk of loss of human lives in one single situation
- A situation which goes beyond the control of available resource of the plant.
- Loss of property as a consequence of the incident.
- A situation apparently may not have much loss but its long-term severity can affect loss of life, production and property.
- Emergencies on account of
 - ✓ Fire
 - ✓ Explosion
 - ✓ Spillage of toxic chemicals
 - ✓ Electrocution
- Natural calamity on account of:
 - ✓ Flood
 - ✓ Earthquake/cyclone/storm/cloud burst/lightning
 - ✓ Natural calamity on account of
- External factor on account of:
 - ✓ Food poisoning
 - ✓ Sabotage

The objective of the study is to assess the likely hazards and risk associated with process and preparation of preliminary Disaster Management Plan (DMP). The main objectives of DMP are:

- To control and contain the incident/accident and if possible, eliminate it
- To minimize the effects of the incident on person, property and environment.

On site disaster

If an accident/incident takes place within the proposed project site and its effects are confined to the premises, involving only the persons working in the proposed project site and the property inside the proposed project site, it is called as on-site disaster.

Offsite disaster

If the accident is such that its affects inside the proposed project site are uncontrollable and it may spread outside the premises, it is called as off-site disaster.

10.1. On-site disaster impact assessment

Main elements on on-site emergency plan

- Leadership and administration
- Role and responsibilities of key personnel
- Emergency action
- Light and power
- Source of energy control
- Protective and rescue equipment
- Communication
- Medical care
- Public relation
- Protection of vital records
- Training
- Periodical revision of plan

Action plan for on-site disaster management plan

- Designated control center/room
- Key personnel

10.1.1. Control Center

This is the main center from where the operations to handle the emergency are directed and coordinated. Facilities to be made available in the control centre are:

- i) Internal and external communication
- ii) Computer and other essential records
- iii) Daily attendance of workers employed
- iv) Storage of hazardous material records and manufacturing records
- v) Pollution records
- vi) Walky-talky

10.1.2. Fire prevention facilities

The unit will be provided with appropriate firefighting equipment including pumps for emergency requirement in the power plant. Any one or combination of the following system will protect all yards and plant.

- Hydrant system
- High velocity and medium velocity sprinkler system
- Water spray (emulsifier system)
- Foam system
- Chemical extinguishers

10.1.3. The key personnel for onsite emergency

1. Works main controller
2. Works incident controller
3. Other key officer
 - a. Communication officer
 - b. Security and fire officer
 - c. Telephone operators
 - d. Medical officers
 - e. Personnel/administrative officers
 - f. Essential work team leaders

Alarm system

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.

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)

Siren for emergency

Siren for emergency should be different from the normal siren. The emergency siren should be audible to a distance of 5km radius. The emergency siren should be used only in case of emergency.

Escape Route

The escape route from each and every plant should be clearly marked. The escape route is the shortest route to reach out of the plant area to open area, which leads to assembly point. This route should be indicated on the layout plan attached to the on-site management plan.

Evacuation

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.

Counting of personnel

All personnel working in the EZ 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.

All clear signal

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”.

Emergency facilities

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
- Torches
- Ladders
- Safety equipment

On-site emergency plan should contain

1. Site plan and topographic plan
2. Plan showing the firefighting facilities
3. Plan showing hazardous material storage area
4. Material safety data sheet for hazardous chemicals
5. Facilities available in main control center
6. List of emergency equipment
7. List of safety equipment
8. List of important telephone numbers and addresses
9. Names, address and contact numbers of key personnel

The on-site emergency plan shall be documented in a printed form in sufficient copies to give all concerned for knowledge, study and easy follow up. The emergency plan shall be rehearsed and practiced at regular intervals to test efficiency of personnel, equipment coordinated efforts and to increase confidence and experience to operate such plan. The plan so prepared should be updated annually and uploaded in the factory website for easy reference.

10.2. Off-site disaster impact assessment

The main objective of the off-site emergency plans are-

- i) To save lives and prevent injuries;
- ii) To prevent or reduce property losses and;
- iii) To provide for quick resumption of normal situation or operation

10.3. Risk assessment plan

Risk involves the occurrence or potential occurrence of some accident consisting of an event or sequence of events. Risk (R) can be mathematically expressed as $R = fD$ where R is the risk (individual or societal), f is the frequency of occurrence of an undesired event and D is the expected damage distance due to likely occurrence of that unfortunate event. The main objectives of the study are as follows:

1. Identification of hazard prone area and estimation of damage distance for the maximum creditable accident scenario visualized for storages;
2. Computation of frequency of occurrence of hazards and evaluation of risks;
3. Based on the studies, suggest risk mitigation measures and arrive at guidelines for Disaster Management and Emergency Preparedness Plan (DMP and EPP).

Emergency Response Plan is indicative. DBL Industrial Park should develop a detail Emergency Response and Disaster Management Plan, which would be prepared by respective professional expert engaged by DBL later phase of the project.

10.4. Covid-19 Health and Safety Plan

This manual includes all measures and precautions to be taken by both employers and employees to mitigate and overcome situations relating to any outbreak such as a pandemic, endemic or an epidemic.

10.4.1. Introduction

DBL Group is committed to ensure that practical and effective measures are in place to minimise the risk of Covid-19 infection for their staff and customers who are directly involved in their business activities.

COVID-19 is a highly infectious disease that is spread from person to person, including through aerosol transmission of particles produced when an infected person exhales, talks, vocalizes, sneezes, or coughs. COVID-19 is highly transmissible and can be spread by people who have no symptoms. Particles containing the virus can travel more than 6 feet, especially indoors and in dry conditions (relative humidity below 40%), and can be spread by individuals who do not know they are infected (WHO).

Measures for protecting workers from exposure to and infection with SARS-CoV-2, the virus that causes Coronavirus Disease 2019 (COVID-19), depends on exposure risk. That risk varies based on the type of work being performed, the potential for interaction (prolonged or otherwise) with people, and contamination of the work environment. This COVID-19 health and safety document provides guidelines for workers and management to take proper preventive measures during any sort of outbreak (pandemic, endemic or epidemic).

Drawn from official sources such as the World Health Organization, the International Labor Organization, the Ministry of Labor and Employment and the Ministry of Health and Family Welfare, it is designed to support employers, worker representative committee members responsible for managing their workplaces during the COVID-19 outbreak to protect workers.

This guidance is not a standard or regulation, and it creates no new legal obligations. It contains recommendations as well as descriptions of mandatory safety and health standards. These guidelines may change according to the existing COVID-19 situation. In that case, the changes might follow the latest guidelines provided by WHO, CDC and other relevant organizations.

10.4.2. Organization Policies and Measures

- Provide health supplies or precautionary material such as face masks, hand gloves, PPE, etc. and make sure they are always worn by employees.
- ‘No mask no entry’ service should be established within the premises during construction and operations.
- Install adequate hand washing facilities within the work premises. Alcohol based hand sanitizers to be provided.
- Measures shall be taken to limit unnecessary interactions among workers as much as possible.
- Develop a COVID-19 task force in the workplace to lead protective actions against the virus. Members of the participation committee, safety committees, safety officers and the medical staff of the factory should be included in the taskforce. Ensure proper representation from every section in the taskforce.
- Communicate and implement COVID-19 related policies and procedures with relevant parties in the factory. This can be through worker training on assigned tasks, including induction training, training of safety and participation committees and/or trade unions, and posting names of COVID- 19 task force members.

- Regularly review, coordinate and update the plan as COVID-19 outbreak conditions change, including as new information about the virus, its transmission and impacts become available.
- Prepare standard operating procedures (SOP) related to receipt of raw materials, accessories, machines, tools, accessories, and any other goods into factory premises, including what is imported from outside the country. This procedure should include a quarantine and a checking area for goods and raw materials brought onto the factory premises.
- Ensure that leave policies are flexible and consistent with public guidance of the Health Ministry and that floor level staff like supervisors, line chiefs and production managers are aware of these policies. Provide floor-level staff with trainings on COVID-19 related needs of workers, including pregnant workers, workers with disabilities and workers with family responsibilities and/or dependents.
- Inform workers about paid leave, health care facilities and factory medical services and non-retaliation for taking sick leave for those showing COVID-19 related symptoms.
- Provide workers with a list of referrals to essential health services including health care facilities treating COVID-19, sexual and reproductive health care (including maternal health care services), and counselling, legal, medical, and shelter services for workers experiencing domestic violence. Ensure that the medical officers and welfare officers are trained to support workers in accessing these services if required.
- Do not require a doctor's prescription or leave certificate for workers who are sick with COVID-19 symptoms to validate their illness or to return to work.
- Educate Human Resources, leave clerk to ensure that flexible leave policy is practiced.
- Maintain flexible policies that permit employees to stay home if a family member or dependent is exhibiting symptoms of COVID-19 (including cough, fever and difficulty breathing among others). Do not require certification or documentation if workers have to take leave to provide care and support to family or dependents.
- Actively encourage sick employees to stay home. Raise awareness among line managers to avoid penalization of employees for taking sick leave.
- Modify the dining area for individual distancing by providing barriers and/or minimum distances between workers.
- Install barriers or windows for providing equipment and raw materials from the store.
- Introduce additional entrances and exits to spread out the flow of staff.
- Establishing hand wash stations at the main gate with adequate amounts of liquid soaps, ensuring hand washing and sanitization for all the visitors and employees while entering into the factory.
- Ensure at least 2 meters distance from one tap to another.
- Hand washing stations should have single-use clean dry cloth, single-use towel or hand dryer. Reusable towels must not be used
- Check workers' and any visitors' temperatures by using an infrared thermometer/thermal scanning and use necessary health check-ups of every person who is entering into the factory by the factory medical team.
- The factory should complete the disinfection prior to workers' entry to the factory.

- Using personal protective equipment (PPEs) such as disposable gloves, a protective suit and a mask is mandatory when disinfection processes are implemented.
- Housekeeping staff should spray disinfectant throughout the factory, and routine cleaning should be reinforced with extra attention to disinfecting stair handrails, lift buttons, insides of lifts, exit door handles, fire door handles, photocopy machines, first aid boxes, dining tables, pantry, production tools and equipment (such as trolleys, WIP storage shelves, baskets, and waste disposal areas).
- Change the attendance system from fingerprint to a punch card system. If temporary registers are used, then the pens used should be wiped with hand sanitizer.
- Ensure each worker carries their individual drinking water bottle and maintains a gap between the water tap and bottle when refilling. Water dispenser taps should be cleaned regularly.
- Use visual physical distancing signage in production areas, warehouses, corridors, entrance, canteens, offices areas and toilets.
- Prepare a separate room for containment in case of workers are suspected or need to consult with in-house medical staff(s). Such quarantine areas need to be isolated from the production floors, medical rooms and common areas.
- The employer must restrict the number of personnel entering isolation areas and protect workers in close contact with (i.e., within six feet of) a sick person or who have prolonged/repeated contact with such persons by using additional engineering and administrative controls, safe work practices and PPE.
- The employer must contact COVID-19 hotline numbers for a necessary diagnosis of the suspected workers.

10.4.3. Safety Advisory for Workers

- Employees not following the safety precautions will not be allowed to enter work premises neither be allowed to work.
- Frequently wash your hands with soap and water for at least 20 seconds. When soap and running water are not immediately available, use an alcohol-based hand sanitizer with at least 60% ethanol or 70% isopropanol as active ingredients and rub hands together until they are dry. Always wash hands that are visibly soiled.
- Avoid touching your eyes, nose, or mouth with unwashed hands.
- Practice good respiratory etiquette, including covering coughs and sneezes or coughing/sneezing into your elbow/upper sleeve.
- Avoid close contact (within 6 feet for a total of 15 minutes or more over a 24-hour period) with people who are visibly sick and practice physical distancing with coworkers and the public.
- Stay home if sick.

11. Traffic Safety Plan

11.1. Introduction

Workplace Traffic Management is an integral part of operations for many industrial sectors including construction works. If workplace traffic is not managed well, it can lead to damaged vehicles properties as well as fatalities and/or serious injuries in the workplace and public areas. A Workplace Traffic Management Plan helps to effectively manage traffic and operation of vehicles at the workplace to minimize risks and hazards.

11.2. Objective

To create an effective Workplace Traffic Management Plan, Project Proponent should first identify desired safety and health objectives. Suitable program and resources should then be established to achieve the objectives. To establish the safety & health objectives for a workplace traffic management plan, the project proponent should:

- Conduct an initial status analysis of current workplace traffic management (during construction and operation phases);
- Carry out risk assessments on all workplace traffic and transport activities, and types of vehicles used;
- Establish the measurement standards for performance monitoring; and
- Evaluate the effectiveness of the plan

11.3. Elements of Traffic Management Plan

The following elements (but not limited to) should be included in an effective Traffic Management Plan. The elements are discussed in detail in the subsequent sections.

1. Workplace Safety and Health (WSH) policy:

Project Proponent's commitment to WSH is the most important factor in ensuring the success of any Workplace Traffic Management Plan. A written WSH policy that clearly states the Project Proponent's commitment and approach in workplace traffic management should be established and endorsed. This written policy should also be communicated to all levels of staff, contractors and vendors

2. Duties and responsibilities:

The duties and responsibilities of personnel managing and implementing the Workplace Traffic Management Plan should be clearly defined for all levels of staff.

3. Traffic rules:

A set of written workplace traffic rules and regulations should be established for compliance by all levels of staff, vendors, contractors and visitors. The rules and regulations should serve as a constant reminder of their obligations and responsibilities.

4. Traffic Risk Management:

The key objective for Workplace Traffic Management Plan is to prevent incidents which may be caused by vehicles by the effective implementation of Workplace Traffic Management plan construction and operation process.

Accidents occur from groundworks to finishing works and managers, workers, visitors to sites and members of the public can all be at risk. Inadequate planning and control are the root cause of many vehicle accidents at workplaces.

Key components to deal with traffic management on site are discussed in the following sections:

➤ Keeping pedestrians and vehicles apart

The majority of workplace transport accidents result from the inadequate separation of pedestrians and vehicles.

This can usually be avoided by careful planning, particularly at the design stage, and by controlling vehicle operations during construction work.

The following actions will help keep pedestrians and vehicles apart:

- **Entrances and exits** – provision of separate entry and exit gateways for pedestrians and vehicles;
- **Walkways** – provision for firm, level, well-drained pedestrian walkways that take a direct route where possible;
- **Crossings** - where walkways cross roadways, provision for a clearly signed and lit crossing point where drivers and pedestrians can see each other clearly;
- **Visibility** - making sure drivers driving out onto public roads can see both ways along the footway before they move on to it;
- **Obstructions** – ensuring no obstruction of walkways so that pedestrians have to step onto the vehicle route; and
- **Barriers** – installation of barrier between the roadway and walkway.

➤ Minimizing vehicle movements

Good planning can help to minimize vehicle movement around a site. To limit the number of vehicles on site:

- Provision for car and van parking for the workforce and visitors away from the work area should be kept;
- controlling entry to the work area; and
- planning storage areas so that delivery vehicles do not have to cross the site

➤ People on site

Employers should take steps to make sure that all workers are fit and competent to operate the vehicles, machines and attachments they use on site by, for example:

- checks when recruiting drivers/operators or hiring contractors;
- training drivers and operators;

- managing the activities of visiting drivers.
- People who direct vehicle movements (signalers) must be trained and authorized to do so.

Accidents can also occur when untrained or inexperienced workers drive construction vehicles without authority. Access to vehicles should be managed and people alerted to the risk.

➤ **Turning vehicles**

The need for vehicles to reverse should be avoided where possible as reversing is a major cause of fatal accidents.

One-way systems can reduce the risk, especially in storage areas.

A turning circle could be installed so that vehicles can turn without reversing.

➤ **Visibility**

If vehicles reverse in areas where pedestrians cannot be excluded the risk is elevated and visibility becomes a vital consideration.

Following aspects should be considered:

- **Aids for drivers** - mirrors, CCTV cameras or reversing alarms that can help drivers can see movement all round the vehicle;
- **Plant and vehicle marshallers** - who can be appointed to control manoeuvres and who are trained in the task;
- **Lighting** - so that drivers and pedestrians on shared routes can see each other easily. Lighting may be needed after sunset or in bad weather;
- **Clothing** - pedestrians on site should wear high-visibility clothing.

➤ **Signs and instructions**

Make sure that all drivers and pedestrians know and understand the routes and traffic rules on site. Use standard road signs where appropriate. Provide induction training for drivers, workers and visitors and send instructions out to visitors before their visit. Some indicative instructions associated with workplace traffic management are-

- Only allow authorized transport vehicles or personnel to enter workplaces;
- Observe all traffic safety measures at workplaces;
- Observe the notices, and safety or traffic signage displayed at workplaces;
- Ensure that the designated pedestrian walkways are used;
- Observe the safe speed limit signs displayed at workplaces;
- Turn on the flashing warning light on the transport vehicles whenever they are in operation;
- Do not load a vehicle beyond its safe working load;
- Avoid reversing vehicles within the compound; and
- Reverse vehicles only under the direction of a banks man or signaler.

5. Safe Work Procedures (SWP):

Safe work procedures are any procedures for carrying out work safely. It also includes any procedure taken to protect the safety and health of persons in the event of an emergency. After risk assessment has been carried out, SWPs should be implemented to manage safety and health risks. Other than emergency plans and safety precautions, it should also reiterate the importance of proper usage of PPE.

6. Training:

Safety and health training is important to equip staff with the required knowledge and skills to work in a safe manner. Management should identify safety training needs for their employees and work out a training plan. For traffic safety, it is important to ensure that drivers are familiar with the model of vehicles they will be operating. Hence, in-house training with support from vehicle's supplier is strongly recommended.

11.4. Factors make difference in Workplace Traffic Safety

<i>Driver</i>	<i>Vehicle</i>	<i>Driving Environment</i>
• Competency • Safe Driving • Safe Loading and Unloading • Driving habits and Behaviors • Safe parking • Avoiding distracted driving • Attention to Health & Fatigueness	• Choice of Vehicle • Maintenance • Vehicle servicing regime • Daily per-operational check	• Workplace Traffic Layout or Routes • Visibility • Reversing • Traffic Signs and Signage • Speed Limit • Housekeeping • Lighting • Provision for Permanent or Mobile Ramp

12. Conclusion & Recommendation

12.1. Conclusion

DBL Industrial Park Limited is a Private Limited Company, playing role as a “Developer” in the project. The project is envisioned to develop a portion of the Shreehatta Economic Zone complying infrastructural and community facilities aligning the prime objective of Bangladesh Economic Zone Authority (BEZA) to attract investors for large manufacturing and service industry.

The project site of DBL Industrial Park is located at Sherpur and Bamongaon Mouza, Maulvibazar Sadar upazila, Moulvi Bazar District, Sylhet Division.

The zone will have access to utilities such as power, water and gas which are critical enablers for development of economic zone. There is adequate supply of unskilled labor from the rural areas in the vicinity, however skilled and semi-skilled labor needs to be procured from the nearby urban agglomerations since there is a dearth of quality educational infrastructure in the region. The proposed Economic Zone falls under the "Red Category" as per The Environment Conservation Rules, 1997 and requires prior environment clearance from DoE, Bangladesh.

The ESIA study has been conducted in accordance with the ToR given by DBL Industrial Park.

Scope of the proposed project is to develop EZ and on-site facilities for upcoming EZ zone. These EZ facilities will be developed by DBL Industrial Park Limited. Proposed development will help in improving the infrastructure of the EZ area. Proposed interventions at the selected site are Site development & Land Filling, Boundary Wall Construction, Road-Footpath - Master drainage line construction, Creation of industrial Plots (09 no's), Administrative & residential building construction, Development of water supply, Electricity supply and Gas supply network, Development of sewer system network, Development of STPs, RMS Gas station, Mini Fire Office, Water body.

As per the assessment, overall the impacts from preconstruction, construction and operation phase have limited adverse environmental impacts, and can be readily addressed through effective mitigation measures as proposed in EMP.

12.2. Recommendations

The recommendations made for the project development on the basis of ESIA study are given below:

- Construction activities for the development of project should be started after obtaining environment clearance certificate from DoE, Bangladesh
- Proposed environment management plan should be implemented strictly both during operation and construction phase of the project.
- Plantation should be carried out within the EZ area as recommended
- Proper training of maintaining environment, health and safety should be given to Project implementing authority in both construction and operation phase

-
- Provision of drain, thick green belt, ETP, STP, segregated storm water shall be adhered to.
 - Environmental monitoring and ecological assessment should be conducted as proposed in environment management plan
 - Separate environment impact assessment study is to be carried out by individual industries and clearance from DoE should be obtained prior to setting up any industrial unit. Individual Industrial units should comply with the conditions of Environmental Clearance

Appendix A. - References

List of secondary data used for carrying out ESIA study and preparation of ESIA report is given in the following table.

Table: Reference Used for ESIA Study

S. No.	Reference
Government Departments	
16.	Bangladesh Bureau of Statistics
17.	Bangladesh Department of Agriculture
18.	Bangladesh Economic Zone Authority
19.	Bangladesh Forest Department
20.	Bangladesh Meteorological Department
21.	Bangladesh Water Development Board
22.	Bangladesh Department of Environment
23.	Department of Fisheries
24.	Department of Forest
25.	Department of Disaster Management
26.	Department of Livestock
27.	Geological survey of Bangladesh
28.	Land & Revenue Department
29.	Soil Resource Development Institute (SRDI)
Reports, Journals & Books	
3.	Common Names of plants growing in Bangladesh and West Bengal (Bengali), Govt. of Bangladesh
4.	Environmental and Social Management Framework, BEZA
5.	Flood Response Preparedness Plan of Bangladesh,
6.	Annual Flood Report, BWDB
7.	Bio ecological Zones of Bangladesh, IUCN
8.	District Statistics, 2011, Moulvibazar
9.	Population & Housing Census-2011, Moulvibazar
10.	Fisheries Statistical Yearbook 2017-18, Bangladesh
11.	Feasibility Study for Sherpur Economic Zone; August-2014
12.	Environmental Impact Assessment Report Shreehatta Economic Zone
13.	Annual Report 2010-2011, Bangladesh Agriculture Development Corporation Monitoring Division
14.	Details shared by DBL Industrial Park Limited
Website	
1.	http://www.gsb.gov.bd/
2.	Google map
3.	http://www.doe.gov.bd/
4.	http://www.badc.gov.bd/site/page/821c0395-1a32-42bb-8666-fbc4819e83cb/Zoning-map
5.	http://www.landzoning.gov.bd/land_use_map.php

Appendix B. - Proposed DBL Industrial Park Site Boundary Coordinates



ID	X	Y
1	365297.859000	2724065.518000
2	365297.859000	2724173.869000
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6	365297.857000	2724443.741000
7	365297.859000	2724502.487000
8	365297.860000	2724523.100000
9	365341.620000	2724523.242000
10	365363.814000	2724524.166000
11	365366.535000	2724554.419000
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14	365373.911000	2724588.234000
15	365381.055000	2724608.588000
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24	365388.737000	2724659.683000
25	365383.897000	2724663.271000
26	365376.495000	2724667.284000
27	365371.322000	2724670.501000
28	365364.367000	2724674.365000
29	365363.819000	2724679.154000
30	365353.720000	2724683.390000
31	365344.598000	2724686.457000
32	365339.924000	2724687.718000
33	365336.511000	2724693.195000
34	365330.126000	2724695.959000
35	365321.526000	2724699.462000
36	365313.963000	2724702.916000
37	365301.551000	2724708.835000
38	365291.713000	2724714.265000
39	365280.691000	2724720.845000
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46	365215.977000	2724712.314000
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48	365205.080000	2724700.182000

Source: DBL Industrial Park Limited

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53	365174.686000	2724688.362000
54	365165.412000	2724689.863000
55	365152.874000	2724690.810000
56	365139.481000	2724693.032000
57	365124.696000	2724696.395000
58	365114.853000	2724698.546000
59	365111.405000	2724699.634000
60	365108.010000	2724700.668000
61	365097.038800	2724703.661200
62	365079.815000	2724710.208000
63	365074.644000	2724712.664000
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71	364949.463000	2724733.358000
72	364945.952000	2724705.678000
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74	364936.080000	2724645.687000
75	364928.838000	2724617.111000
76	364923.681000	2724593.570000
77	364922.968000	2724590.089000
78	364919.452000	2724577.317000
79	364915.366000	2724555.907000
80	364898.388000	2724560.311000
81	364881.049000	2724563.855000
82	364853.541000	2724567.743000
83	364815.983000	2724570.413000
84	364788.234000	2724572.317000
85	364770.890000	2724573.331000
86	364746.451000	2724575.933000
87	364699.245000	2724582.483000
88	364696.366000	2724559.832000
89	364692.617000	2724540.453000
90	364675.436000	2724542.074000
91	364653.584000	2724545.464000
92	364637.020000	2724546.405000
93	364608.037000	2724547.658000
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97	364558.058000	2724472.920000

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137	364622.611000	2723686.885000
138	364628.266000	2723682.270000
139	364631.761000	2723676.216000
140	364633.727000	2723670.215000
141	364636.446000	2723664.718000
142	364640.080000	2723659.147000
143	364647.906000	2723655.539000
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145	364652.389000	2723642.882000
146	364654.814000	2723638.701000

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148	364658.448000	2723631.328000
149	364661.264000	2723626.638000
150	364668.340000	2723622.666000
151	364670.063000	2723617.033000
152	364673.720000	2723606.111000
153	364676.026900	2723599.165600
154	364677.111000	2723595.918000
155	364679.017000	2723590.305000
156	364680.074000	2723587.225000
157	364682.362000	2723583.082000
158	364683.348300	2723562.906200
159	364701.681900	2723558.452200
160	364723.301800	2723558.906100
161	364688.811392	2723588.402821
162	364721.818983	2723622.021980
163	364756.125783	2723592.907769
164	364760.442100	2723597.393800
165	364771.119300	2723608.575700
166	364782.887400	2723620.382100
167	364792.486800	2723630.146800
168	364804.436500	2723642.104600
169	364813.820100	2723651.058800
170	364822.464400	2723658.957200
171	364835.506500	2723671.039700
172	364836.971000	2723674.791000
173	364895.396000	2723717.476000
174	364983.022000	2723777.990000
175	365104.433000	2723851.218000
176	365175.333000	2723880.653000
177	365185.403000	2723883.393000
178	365185.498000	2723883.422000
179	365219.223100	2723896.630500
180	365218.919000	2723897.902000
181	365216.941000	2723902.330000
182	365213.442000	2723906.466000
183	365207.670000	2723910.150000
184	365213.001000	2723917.369000
185	365217.898000	2723923.944000
186	365225.037000	2723933.455000
187	365231.780000	2723942.484000
188	365239.391000	2723952.709000
189	365245.114000	2723960.337000
190	365253.901000	2723972.101000
191	365262.279000	2723983.591000
192	365268.313000	2723983.587000
193	365277.133000	2723983.782000
194	365284.508000	2723985.023000
195	365290.537000	2723987.712000

ID	X	Y
196	365295.527000	2723990.760000
197	365297.861000	2723994.340000
198	365297.873000	2724012.733000

Appendix C. - Project Plans and Designs

C.1. Master Plan



Master plan
Architectural 20-01-2020

C.2. Internal Road Network



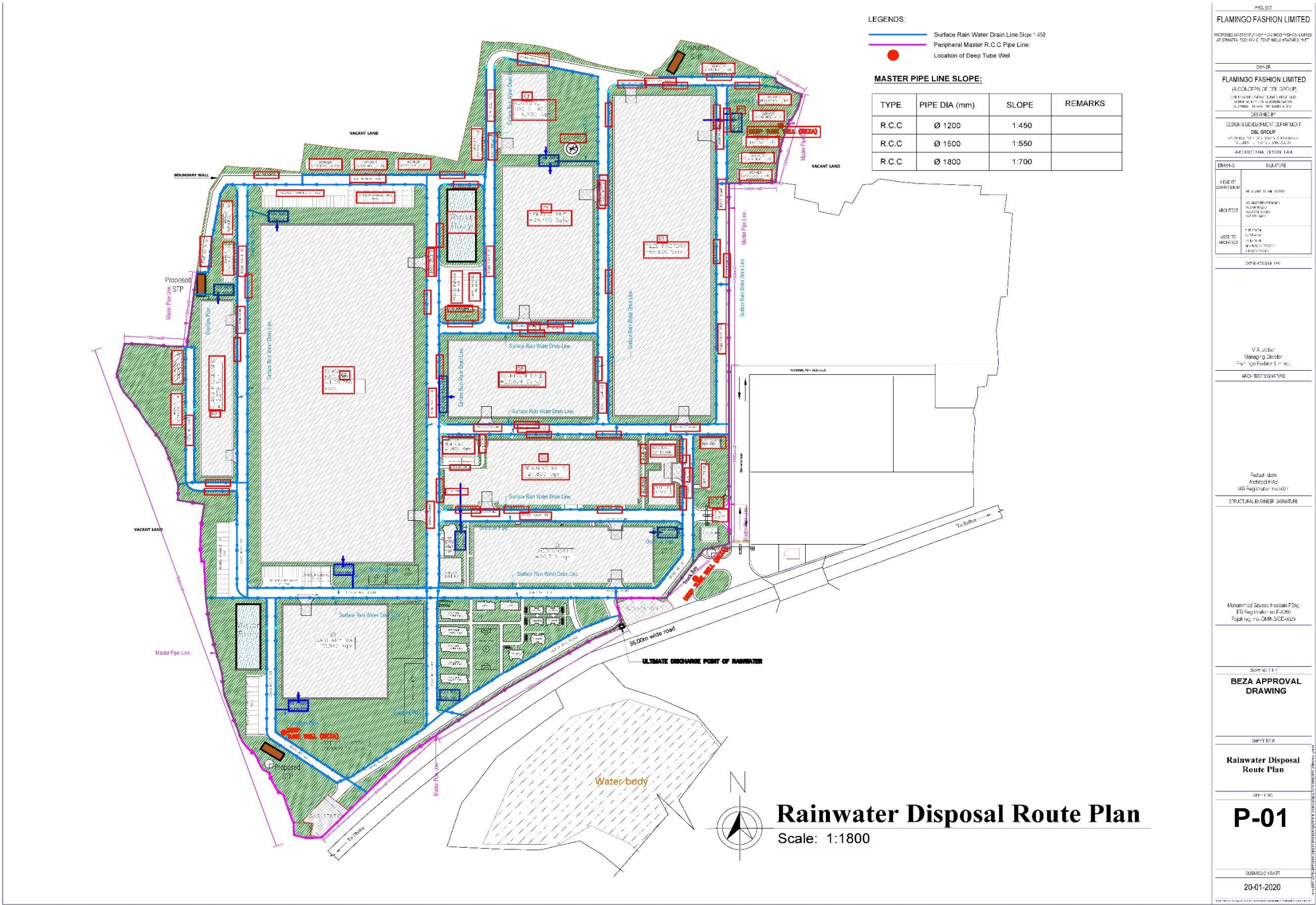
Master plan
01-01-2020(BEZA approved)

C.3. HT and Gasline Network

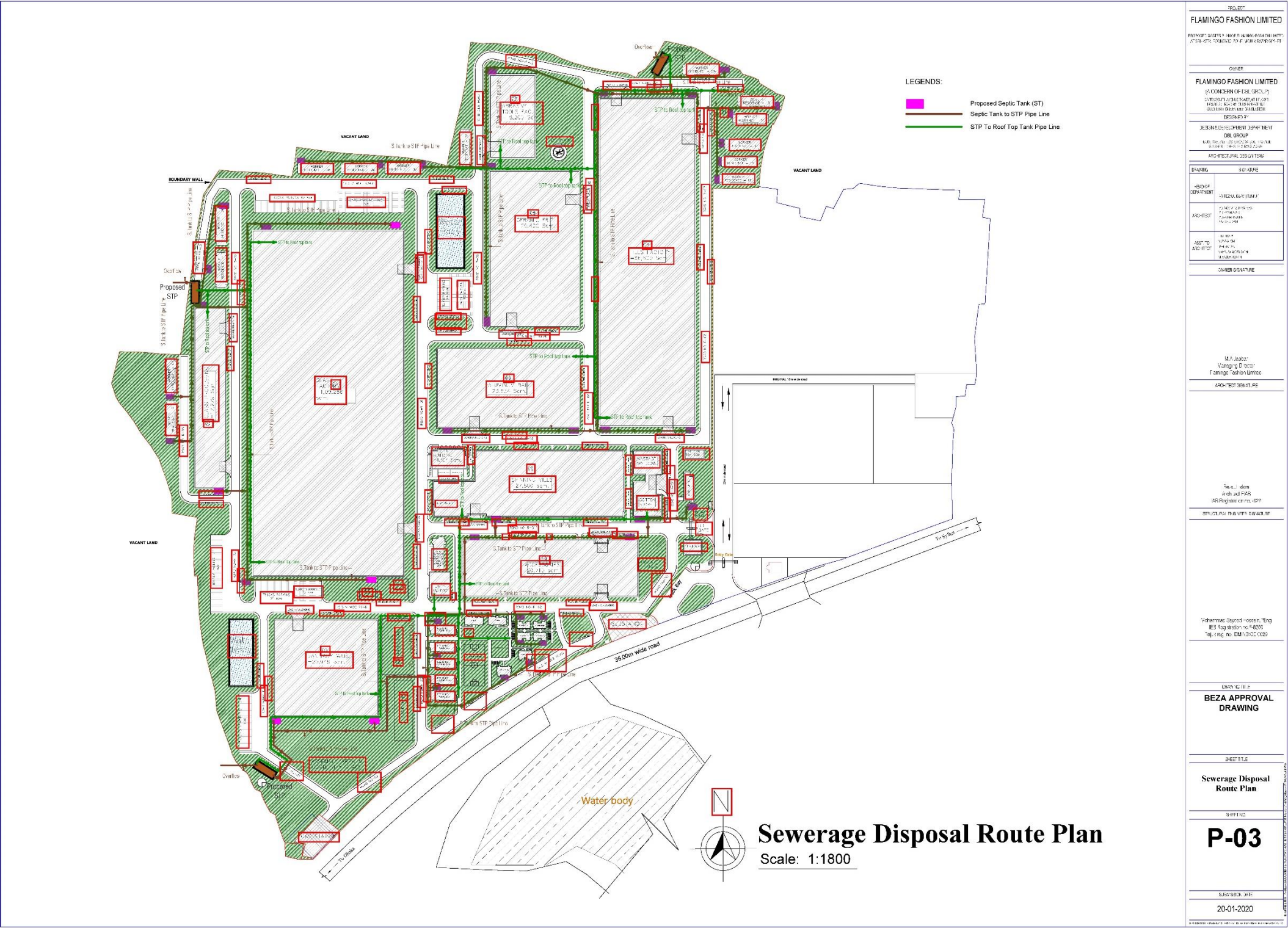


Master plan
Electrical 11-03-2020

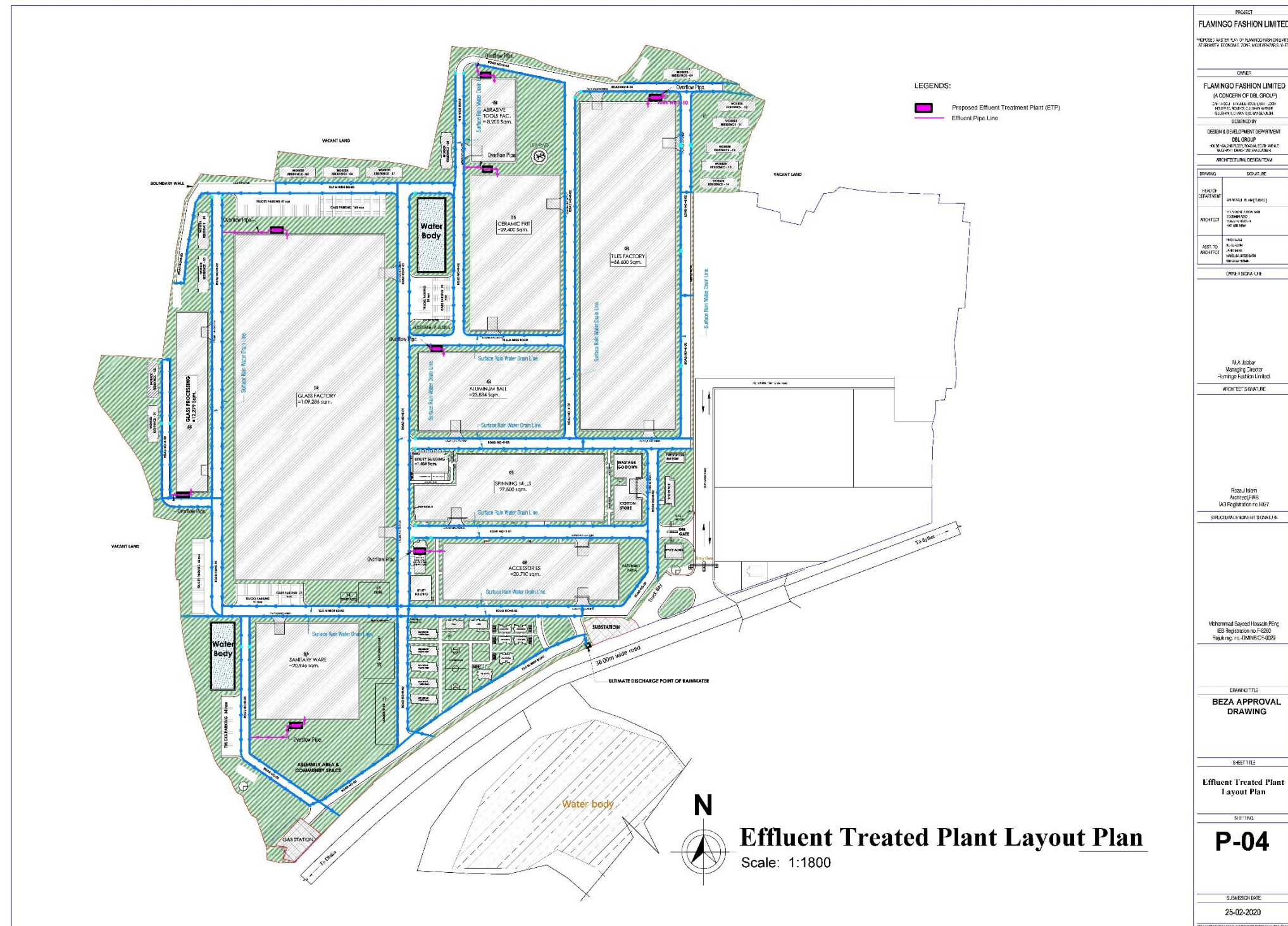
C.4. Rainwater Disposal Route Plan



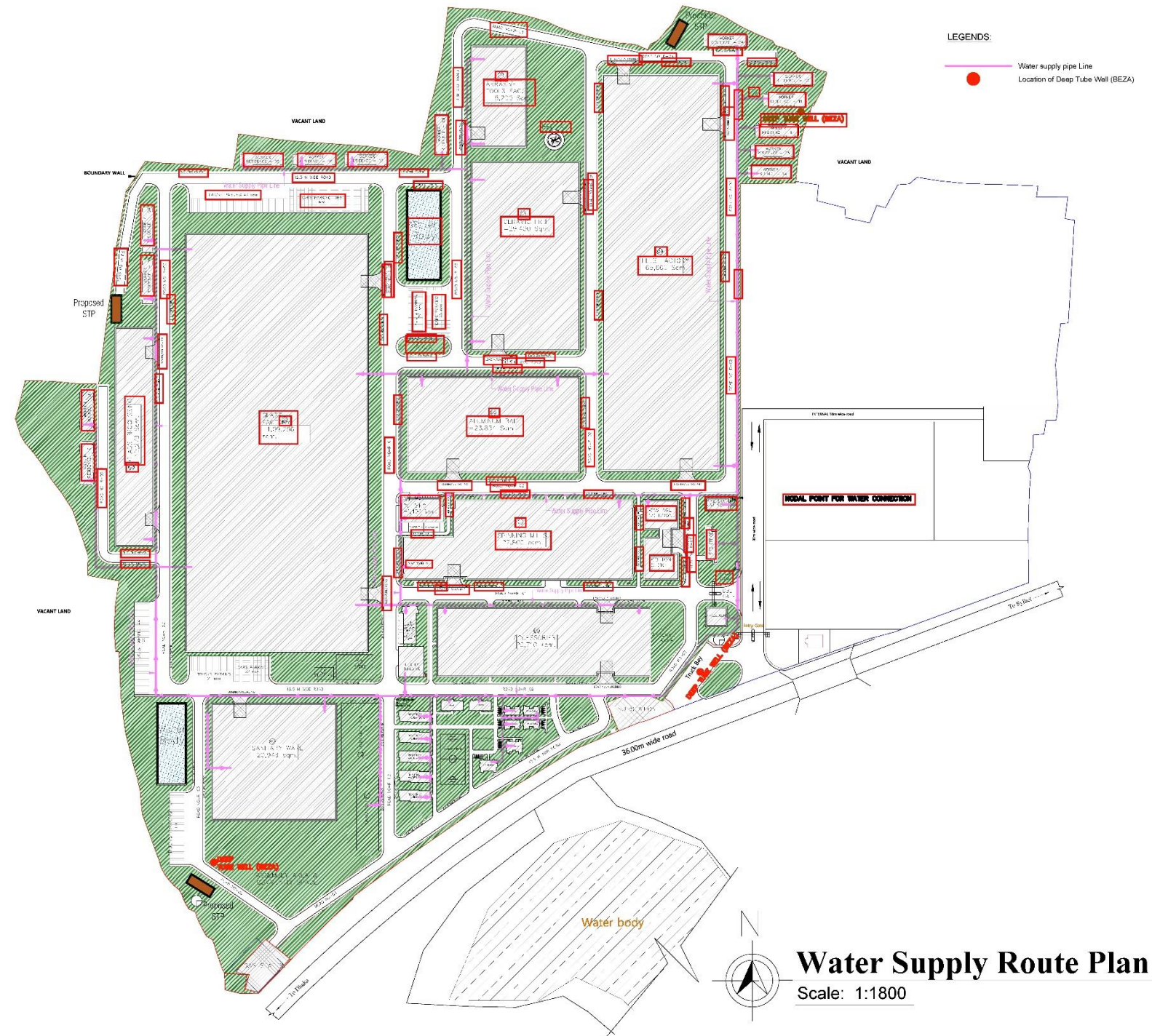
C.5. Sewerage Disposal Route Plan



C.6. ETP & Discharge



C.7. Water Supply Route Plan

[illegible]

Appendix D. - Utility Requirement Breakup

Sl. No.	Name of the Project	Load	UOM	Required Utility Support / Man Power	UOM	Factory running hour per day
On Process requirement						
1	Float Glass Production Line					
	Gas Consumption (Captive)	12,000	kW	99,600	Cft/hr	24
	Gas Consumption (industrial)	130,000	m3/Day	191,208	Cft/hr	24
	Water Consumption	21,200	m3/Day	21,200	m ³ /day	24
	Fresh Water Consumption	800	m3/Day	800	m ³ /day	24
	Man Power	940	Person	940	Person	24
2	Glass Processing Factory					
	Gas Consumption (Captive)	6,000	kW	49,800	Cft/hr	24
	Gas Consumption (industrial)	-	m3/Day	-		24
	Water Consumption	5,000	m3/Day	5,000	m ³ /day	24
	Man Power	200	Person	200	Person	24
3	Jinnat Spinning Mills Ltd					
	Gas Consumption (Captive)	12,000	kW	99,600	Cft/hr	24
	Gas Consumption (industrial)	-	m3/Day	-		24
	Water Consumption	2,200	m3/Day	2,200	m ³ /day	24
	Man Power	1,000	Person	1,000	Person	24
4	Sanitary ware					
	Gas Consumption (Captive)	6,000	kW	49,800	Cft/hr	24
	Gas Consumption (industrial)	100,000	m3/Day	147,083	Cft/hr	24
	Water Consumption	1,800	m3/Day	1,800	m ³ /day	24
	Man Power	500	Person	500	Person	24
5	Ceramics Tiles Factory					
	Gas Consumption (Captive)	12,000	kW	99,600	Cft/hr	24
	Gas Consumption (industrial)	140,000	m3/Day	205,917	Cft/hr	24
	Water Consumption	2,880	m3/Day	2,880	m ³ /day	24
	Man Power	700	Person	700	Person	24
6	Abrasive Tools Factory					

Sl. No.	Name of the Project	Load	UOM	Required Utility Support / Man Power	UOM	Factory running hour per day
	Gas Consumption (Captive)	3,000	kW	24,900	Cft/hr	24
	Gas Consumption (industrial)	900	m3/Day	1,324	Cft/hr	24
	Water Consumption	480	m3/Day	480	m ³ /day	24
	Man Power	200	Person	200	Person	24
7	Frit Manufacturing Factory					
	Gas Consumption (Captive)	4,000	kW	33,200	Cft/hr	24
	Gas Consumption (industrial)	50,000	m3/Day	73,542	Cft/hr	24
	Water Consumption	800	m3/Day	800	m ³ /day	24
	Man Power	500	Person	500	Person	24
8	Alumina Grinding Ball					
	Gas Consumption (Captive)	6,000	kW	49,800	Cft/hr	24
	Gas Consumption (industrial)	120,000	m3/Day	176,500	Cft/hr	24
	Water Consumption	2,500	m3/Day	2,500		24
	Man Power	300	Person	300		24
9	Accessories					
	Gas Consumption (Captive)	6,500	kW	53,950	Cft/hr	24
	Gas Consumption (industrial)	5,040	m3/Day	7,413	Cft/hr	24
	Water Consumption	150	m3/Day	150	m ³ /day	24
	Man Power	1,480	Person	1,480	Person	24
Non-process process requirement						
10	Dormitory & Guest house					
	Electricity consumption	6,720	kW			
	Gas Consumption-Household	3,360	cft/hr			
	Water Consumption	552.90	m3/Day			
	Total Summary:					
	Electricity Consumption	74,220	KW			
	Water Consumption	38,363	m3/Day			
	Manpower	5,820	nos			

Appendix E. - Baseline Monitoring Report by DoE

Ambient air and Noise Monitoring Report

শেখ হাসিনার বাংলাদেশ

পরিচ্ছন্ন পরিবেশ

গণপ্রজাতন্ত্রী বাংলাদেশ সরকার

পরিবেশ অধিদপ্তর

সিলেট বিভাগীয় কার্যালয়

বিভাগীয় পর্যায়ের বহুতল অফিস ভবন (৫ম তলা)

আলমপুর, সিলেট

www.doe.gov.bd

নং-পঅ/(পানি/বায়ু/শব্দ)-৬০২৪/২০১৩/ ২৮৬

৩১/১২/১৪২৬ বঙ্গাব্দ

তারিখ : ২৫/১২/২০২০ খ্রিষ্টাব্দ

বিষয় : ফলাফল প্রেরণ।

সূত্র : অত্রাফিসে গত ১৫/০১/২০২০ খ্রি. তারিখে আবেদন

উপর্যুক্ত বিষয় ও সূত্রের প্রেক্ষিতে শেরপুর ও বামনগাঁও মৌজা, মৌলভীবাজার সদর, মৌলভীবাজার এলাকায় অবস্থিত “ডিবিএল ইন্ডাস্ট্রিয়াল পার্ক লিঃ” নামক (প্রস্তাবিত) প্রতিষ্ঠানটির পরিবেষ্টক বায়ু ও শব্দের মানমাত্রা পরীক্ষার ফলাফল এতদসঙ্গে প্রেরণ করা হলো।

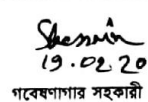
(a) Air

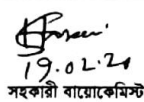
Sample Location	Date	Lab Code No.	SPM μg/m³	NOx μg/m³	SOx μg/m³
North Side (Up) of industrial park (Proposed)	11.02.2020	402	131	6	ND
Ambient Air Quality Standards as per ECR-1997 (Amendment-2005)			200	100	365

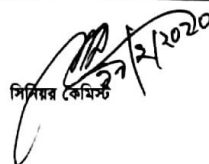
(b) Sound

Lab Code No	Sample Location	Date	Time	Sound Level in (dBA)
383	North Side of the boundary	11.02.2020	11:20 am	58.2
	South Side of the boundary	11.02.2020	11:28 am	57.3
	East Side of the boundary	11.02.2020	11:36 am	49.5
	West Side of the boundary	11.02.2020	11:47 am	48.4
Bangladesh Standard at day time for Mixed Area as per Noise pollution (control) rules, 2006		-	6:00 am To 9:00 pm	60.0


নমুনা সংগ্রহকারী


গবেষণাগার সহকারী


সহকারী বায়োকেমিস্ট


সিলেট কমিস্ট


(ইসরাফ জাহান গান্ধী)
পরিচালক
ফোন : ০৮২১-৮৪০১২২

ব্যবস্থাপনা পরিচালক

ডিবিএল ইন্ডাস্ট্রিয়াল পার্ক লিঃ (প্রস্তাবিত)

শেরপুর ও বামনগাঁও মৌজা, মৌলভীবাজার সদর, মৌলভীবাজার

শেখ হাসিনার বাংলাদেশ
পরিচ্ছন্ন পরিবেশ

গণপ্রজাতন্ত্রী বাংলাদেশ সরকার
পরিবেশ অধিদপ্তর
সিলেট বিভাগীয় কার্যালয়
বিভাগীয় পর্যায়ের বহুতল অফিস ভবন (৫ম তলা)
আলমপুর, সিলেট
www.doe.gov.bd

নং-পঅ/(পানি/বায়ু/শব্দ)-৬০২৪/২০১৩/ ২৫৭

২৫/১২/২০২০ বঙ্গাব্দ
তারিখ : ২৫/১২/২০২০ খ্রিষ্টাব্দ

বিষয় : ফলাফল প্রেরণ।

সূত্র : অত্রাফিসে গত ১৫/০১/২০২০ খ্রি. তারিখে আবেদন

উপর্যুক্ত বিষয় ও সূত্রের প্রেক্ষিতে শেরপুর ও বামনগাঁও মৌজা, মৌলভীবাজার সদর, মৌলভীবাজার এলাকায় অবস্থিত “ডিবিএল ইন্ডাস্ট্রিয়াল পার্ক লিঃ” নামক (প্রস্তাবিত) প্রতিষ্ঠানটির পরিবেষ্টক বায়ু ও শব্দের মানমাত্রা পরীক্ষার ফলাফল এতদসঙ্গে প্রেরণ করা হলো।

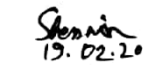
(a) Air

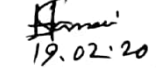
Sample Location	Date	Lab Code No.	SPM μg/m ³	NOx μg/m ³	SOx μg/m ³
South Side (Down) of industrial park (Proposed)	29.01.2020	393	163	8	ND
Ambient Air Quality Standards as per ECR-1997 (Amendment-2005)			200	100	365

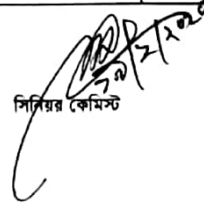
(b) Sound

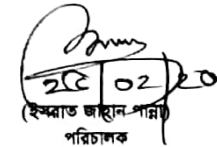
Lab Code No	Sample Location	Date	Time	Sound Level in (dBA)
373	East Side of the boundary	29.01.2020	10:20 am	57.3
	South Side of the boundary	29.01.2020	10:26 am	58.3
	North Side of the boundary	29.01.2020	10:46 am	49.0
	West Side of the boundary	29.01.2020	10:56 am	49.4
Bangladesh Standard at day time for Mixed Area as per Noise pollution (control) rules, 2006		-	6:00 am To 9:00 pm	60.0


নমুনা সংগ্রহকারী


গবেষণাগার সহকারী


সহকারী বায়োকেমিস্ট


সিনিয়র কেমিস্ট


২৫/১২/২০
(ইমরাত জাহান পার্বী)
পরিচালক
ফোন : ০৮২১-৮৪০১২২

ব্যবস্থাপনা পরিচালক
ডিবিএল ইন্ডাস্ট্রিয়াল পার্ক লিঃ (প্রস্তাবিত)
শেরপুর ও বামনগাঁও মৌজা, মৌলভীবাজার সদর, মৌলভীবাজার

Surface Water Monitoring

শেখ হাসিনার বাংলাদেশ
পরিবেশ পরিবেশ

গণপ্রজাতন্ত্রী বাংলাদেশ সরকার
পরিবেশ অধিদপ্তর
সিলেট বিভাগীয় কার্যালয়
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আলমগুর, সিলেট
www.doc.gov.bd

স্মারক: স্ব/পরি/স্ব/স্ব/১৯২৪/২০১৩/ ১৫২

বিষয়: ফলাফল প্রেরণ।

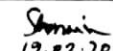
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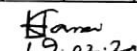
তারিখ: ২২/১০/২০২০ বঙ্গাব্দ
২৫/১০/২০২০ খ্রিষ্টাব্দ

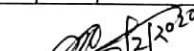
উপর্যুক্ত বিষয় ও সূত্রের পরিপ্রেক্ষিতে বামনগাঁও ও শেরপুর মৌজা, মৌলভীবাজার সদর, মৌলভীবাজার এলাকায় অবস্থিত "ডিবিএল ইন্ডাস্ট্রিয়াল পার্ক লিমিটেড" নামক প্রস্তাবিত প্রতিষ্ঠানের জু-পল্টন পার্কিং হতে সংগৃহীত নমুনা বিশ্লেষণ ফলাফল প্রেরণ করা হলো।

Sample Location	Date	Lab Code No.	Temp C	pH	BOD mg/l	COD mg/l	EC µS/cm	TDS mg/l	TC mg/l	SS mg/l	Chromium mg/l	Turbidity (NTU) mg/l	Lead (Pb) mg/l	Chloride mg/l	Alkalinity mg/l	Iron mg/l	Sulphate mg/l	Total Hardness mg/l	Fluoride mg/l	Ammonia mg/l	Oil & Grease mg/l
মোঃ আব্দুল্লাহ এর বাড়ি মালাপাড়া পুকুর, শারফুল ও না আইনগাঁও, মৌলভীবাজার	11.02.2020	341	22.8	6.6	3	9	81	43	0.04	10	0.03	14	ND	0.4	13	0.12	03	0.12	ND	0.08	ND
Bangladesh Standard for Inland Surface Water as per ECR 1997				6.0-9.0	50	200	1200	2100	0.05	150	0.05	N/A	0.05	150-600	200-500	0.3-1.0	400	200-500	1.0	0.5	0.01


নমুনা সংগ্রহকারী


১৭.০২.২০
গবেষণায় সহকারী


১৭.০২.২০
সহকারী ব্যবস্থাকর্মী


১৭/০২/২০২০
সিটিজেন কমিশন


২৫/০২/২০
ইসরাফ জাহান শাহা
পরিচালক
ফোন: ০৮২১-৮৪০১২২

ব্যবস্থাপনা পরিচালক
ডিবিএল ইন্ডাস্ট্রিয়াল পার্ক লিমিটেড (প্রস্তাবিত)
বামনগাঁও ও শেরপুর মৌজা, মৌলভীবাজার সদর, মৌলভীবাজার

শেখ হাসিনার বাংলাদেশ
পরিচালনা পরিষদ

গণপ্রজাতন্ত্রী বাংলাদেশ সরকার
পরিবেশ অধিদপ্তর
সিলেট বিভাগীয় কার্যালয়
বিভাগীয় পর্যায়ের গৃহস্থালি অফিস ভবন (৫ম তলা)
আলমপুর, সিলেট
www.doc.gov.bd

নং: পআ/পরি/বা/পক/৬০২৪/২০১৬/ ২৫৮

বিষয়: তলাতলা প্রকল্প।

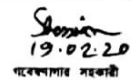
সূত্র: অর্ডার নং ১৪/০১/২০২০ খ্রি তারিখের মার্বিলকৃত আবেদন।

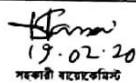
তারিখ: ২৫/০১/২০২০ বঙ্গাব্দ
২৫/০২/২০২০ খ্রিস্টাব্দ

উপর্যুক্ত বিষয় ও সূত্রের পরিপ্রেক্ষিতে বামনগাঁও ও শেরপুর মৌজা, মৌলভীবাজার সদর, মৌলভীবাজার এলাকায় অবস্থিত "ভিবিএল ইন্ডাস্ট্রিয়াল পার্ক লিমিটেড" নামক প্রতিষ্ঠানের প্রাতিষ্ঠানিক ল্যাবের পানির হতে সংগৃহীত নমুনা বিশ্লেষণ ফলাফল এতদসঙ্গে প্রেরণ করা হলো।

Sample Location	Date	Lab Code No.	Tem ^o C	pH	BOD mg/l	COD mg/l	EC μ S/cm	TDS mg/l	TC mg/l	SS mg/l	Chromium mg/l	Turbidity (NTU) mg/l	Lead (Pb) mg/l	Chloride mg/l	Alkalinity mg/l	Iron mg/l	Sulphate mg/l	Total Hardness mg/l	Fluoride mg/l	Ammonia mg/l	Oil & Grease mg/l
গৌড়িল খাটা, শেরপুর, মৌলভীবাজার সদর, মৌলভীবাজার	29.01.2020	337	23.2	7.2	4	11	141.4	60	0.03	41	0.04	21	ND	0.5	15	0.15	05	0.15	ND	0.07	ND
Bangladesh Standard for Inland Surface Water as per ECR-1997				6.0-9.0	50	200	1200	2100	0.05	150	0.05	N/A	0.05	150-600	200-500	0.3-1.0	400	200-500	1.0	0.5	0.01


নমুনা সংগ্রহকারী


১৭.০২.২০
পরিবেশাধার সহকারী


১৭.০২.২০
সহকারী বায়োকেমিস্ট


২১/২/২০
শিল্পের কেমিস্ট


২৫/০২/২০
ইসরাফ আহমেদ পাট্টা
পরিচালক
ফোন: ০৮২১-৮৪০১২২

ব্যবস্থাপনা পরিচালক
ভিবিএল ইন্ডাস্ট্রিয়াল পার্ক লিমিটেড (প্রস্তাবিত)
বামনগাঁও ও শেরপুর মৌজা, মৌলভীবাজার সদর, মৌলভীবাজার

Ground Water Monitoring

শেখ হাসিনার বাংলাদেশ
পরিচ্ছন্ন পরিবেশ

গণপ্রজাতন্ত্রী বাংলাদেশ সরকার
পরিবেশ অধিদপ্তর
সিলেট বিভাগীয় কার্যালয়
বিজ্ঞানীয় পর্যায়ের বহুতল অফিস ভবন (৫ম তলা)
আলমপুর, সিলেট
www.doc.gov.bd

নং- পত্র/পানি/বাউ/পশ-৬০২৪/২০১০-২৬০

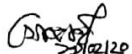
তারিখ: ২৭/১১/১১/১৪২৬ বঙ্গাব্দ
২৫/১০/২০২০ খ্রিষ্টাব্দ

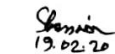
বিষয়: ফলাফল রিপোর্ট।

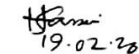
সূত্র: অত্রিক্রমে গত ১৫/০১/২০২০ খ্রি. তারিখের দাবিলকৃত আবেদন।

উপর্যুক্ত বিষয় ও সূত্রের পরিপ্রেক্ষিতে বামনপাণ্ড ও শেতপুর মৌজা, মৌলভীবাজার সদর, মৌলভীবাজার এলাকায় “ডিবিএল ইন্ডাস্ট্রিয়াল পার্ক লিমিটেড” নামক (প্রস্তাবিত) ইকোনোমিক জোন এর ভূগর্ভস্থ (ন্যাক্স) পানির নমুনা বিশ্লেষণিত ফলাফল প্রথমসঙ্গে প্রেরণ করা হলো।

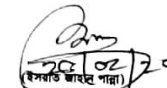
Sample Location	Date	Lab Code No.	Temp°C	pH	BOD mg/l	COD mg/l	TDS mg/l	EC μ s/cm	Alkalinity mg/l	TSS mg/l	Turbidity (NTU) mg/l	Chloride mg/l	Iron mg/l	Total Hardness mg/l	Coliform n/100 ml
মোঃ আনোয়ার হিজার বাড়ি, শেতপুর, মৌলভীবাজার সদর, মৌলভীবাজার	29.01.20	338	24.9	7.08	0.4	4	60	445	16	8	4	5	0.14	15	0
Bangladesh Standard for Inland Surface Water as per ECR-1997			20-30	6.5-8.5	0.2	4	1000	1200	10-500	10	10	150-600	0.3-1.0	200-500	0


নমুনা সংগ্রহকারী


গবেষণাগার সহকারী


সহকারী ব্যবস্থাকর্তৃক


সিস্টেম কেয়ার


ইসরাফিল আহমেদ পাট্টা
পরিচালক
ফোন: ০৮২১-৮৪০১২২

ব্যবস্থাপনা পরিচালক
ডিবিএল ইন্ডাস্ট্রিয়াল পার্ক লিমিটেড (প্রস্তাবিত)
বামনপাণ্ড ও শেতপুর মৌজা, মৌলভীবাজার সদর, মৌলভীবাজার

পরিষ্কৃত পরিবেশ

গণপ্রজাতন্ত্রী বাংলাদেশ সরকার
পরিবেশ অধিদপ্তর
সিলেট বিভাগীয় কার্যালয়
বিভাগীয় পর্যায়ের বহুতল অফিস ভবন (৫ম তলা)
আলমপুর, সিলেট
www.doc.gov.bd

স্মারক/পানি/বায়ু/স্বাস্থ্য-৬০২৪/২০২০, ২৬০

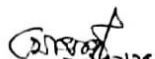
তারিখ: ২০/০২/২০২০ বঙ্গাব্দ
২৫/০২/২০২০ খ্রিষ্টাব্দ

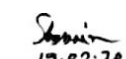
বিষয়: ফলাফল প্রেরণ।

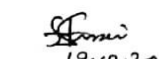
সূত্র: অর্ডিন্যান্স নং ১৪/০১/২০২০ খ্রি. তারিখের দাখিলকৃত আবেদন।

উপর্যুক্ত বিষয় ও সূত্রের পরিপ্রেক্ষিতে বামনলী ও শেরপুর মৌজা, মৌলভীবাজার সদর, মৌলভীবাজার এলাকায় “ভিবিএল ইন্ডাস্ট্রিয়াল পার্ক লিমিটেড” নামক (প্রস্তাবিত) ইকোনোমিক জোন এর কৃষকত্ব (নসত্ব) পানির নমুনা বিশ্লেষিত ফলাফল প্রেরণ করা হলো।

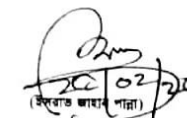
Sample Location	Date	Lab Code No.	Tem °C	pH	BOD mg/l	COD mg/l	TDS mg/l	EC µs/cm	Alkalinity mg/l	TSS mg/l	Turbidity (NTU) mg/l	Chloride mg/l	Iron mg/l	Total Hardness mg/l	Coliform n/100 ml
মৌজা ভাঙ্গুয়ায় এর বাড়ির কৃ- গারত্ব (নসত্ব) পানি পারকুল ও নং জাউনকাশি, মৌলভী: জব্বার	11.02.2020	342	24.3	7.07	0.5	3	56	457	18	7	5	4	0.12	14	0
Bangladesh Standard for Inland Surface Water as per ECR-1997			20-30	6.5-8.5	0.2	4	1000	1200	10-500	10	10	150-600	0.3-1.0	200-500	0


নমুনা সংগ্রহকারী


১৭.০২.২০
পরিবেশপার সহকারী

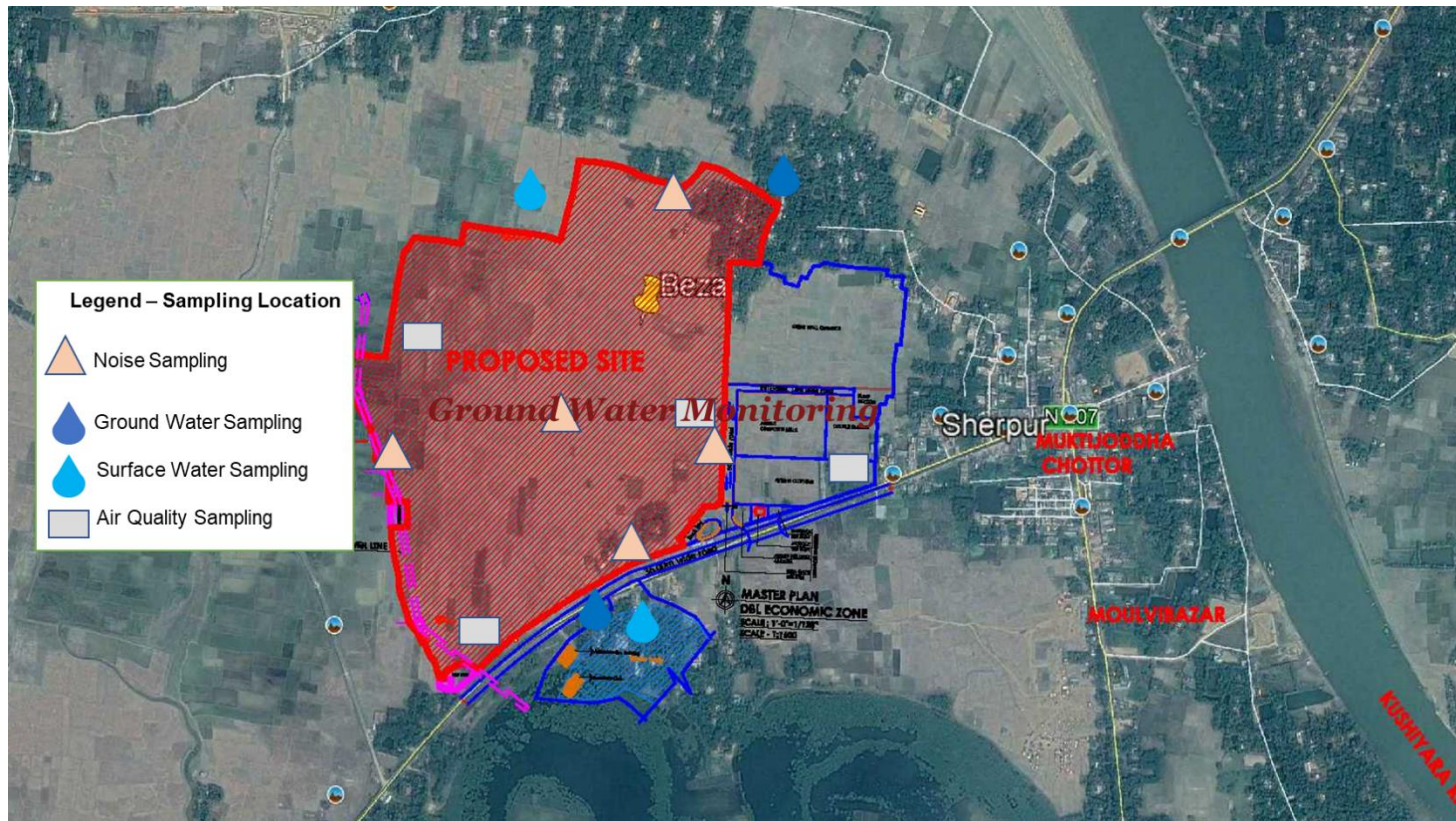

১৭.০২.২০
সহকারী বায়োকেমিস্ট


১৭/০২/২০
নির্বাহী কেমিস্ট


১৭/০২/২০
(ইন্সপেক্টর জেনারেল পানি)
পরিচালক
ফোন: ০৮২১-৮৪০১২২

বাবস্থাপনা পরিচালক
ভিবিএল ইন্ডাস্ট্রিয়াল পার্ক লিমিটেড (প্রস্তাবিত)
বামনলী ও শেরপুর মৌজা, মৌলভীবাজার সদর, মৌলভীবাজার

Sampling Location Map



Appendix F. - List of Participants: Stakeholder Consultation

Name of Person	Village	Occupation	Date of Consultation
Hazi Barik Miah	Daler Bamongaon	Social elite	03-02-2020
Md Abdus Shahid	Daler Bamongaon	Social Elite	03-02-2020
Md Abdul Khalek	Daler Bamongaon	Farmer	03-02-2020
Sumon Ahmed	Daler Bamongaon	UP member	03-02-2020
Md Ful Miah	Daler Bamongaon	Farmer	03-02-2020
Md Abul Miah	Daler Bamongaon	Farmer	03-02-2020
Ajoy kumar	Sherpur	Village Doctor	03-02-2020
Md Abdus Salam Miah	Daler Bamongaon	Farmer	03-02-2020
Arnindo Sutrodor	Parkul	Farmer	03-02-2020
Subod sutrodor	Parkul	Farmer	03-02-2020

DBL Industrial Park Limited Stakeholder meeting

List of Participants

Date: 18-3-2020 Location: Daler par Name of Group: Farmer & Social Etc

SL	Name of Participant	Occupation	Contact Number
1	સા. હામરુન વસા	કામ	01783508436
2	સા. હોદ્દા-વસા	"	01717028058
3	સા. રામલન વસા	"	01757700813
4	સા. હામરુન વસા	"	01731959977
5	સા. રામલન વસા	"	01780201818
6	સા. રામલન વસા	"	01732037897
7	સા. હામરુન વસા	"	01751503344
8	સા. હામરુન વસા	"	01726358282
9	સા. રામલન વસા	"	01739844240
10	સા. રામલન વસા	"	01787460927
11	સા. રામલન વસા	"	01742452969
12	સા. રામલન વસા	"	01732097194
13	સા. રામલન વસા	"	01724687818
14	સા. રામલન વસા	"	01783948568
15	સા. રામલન વસા	"	01302769749
16	સા. રામલન વસા	"	01307983576
17	સા. રામલન વસા	"	01732097194
18	સા. રામલન વસા	"	01309690319
19	સા. રામલન વસા	"	01756088213
20	સા. રામલન વસા	"	01726968188
21	સા. રામલન વસા	"	0179896017
22	સા. રામલન વસા	"	01759866022
23	સા. રામલન વસા	"	01769700956
24	સા. રામલન વસા	"	01773292209
25	સા. રામલન વસા	"	01783899489

DBL Industrial Park Limited **Stakeholder meeting**

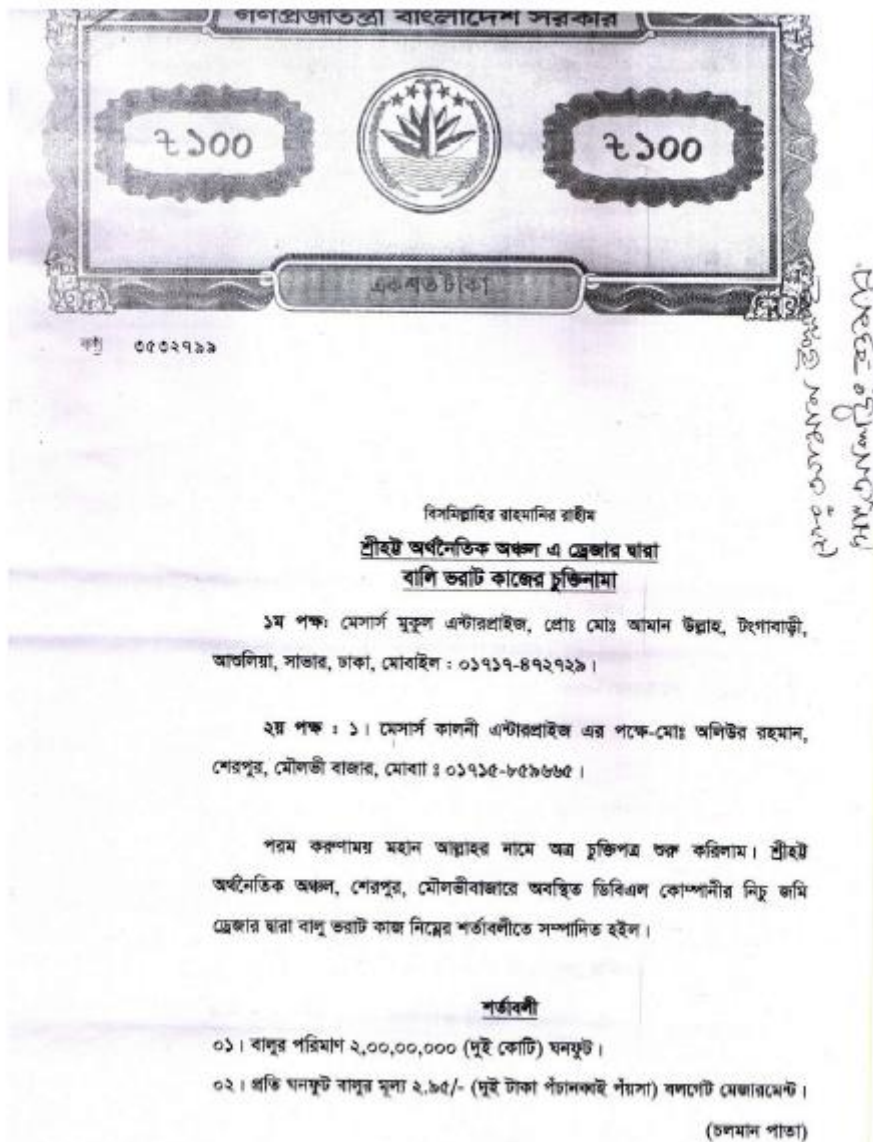
List of Participants

Date: 18-3-2020 Location: Dehera Dun Name of Group: Parmar School

Sl	Name of Participant	Occupation	Contact Number
21	अश्विन - अग्रवाल -	शिक्षक	01721488173
29	सुनील - शर्मा -	"	01721968148
28	आर्य - अग्रवाल -	"	01729995553
27	राजेश - अग्रवाल -	"	01799847419
26	मिथुन - अग्रवाल -	"	01770989959
25	निधि - अग्रवाल -	"	01731459978
24	आर्य - अग्रवाल -	"	01779961627
23	आर्य - अग्रवाल -	"	01719363689
22	आर्य - अग्रवाल -	"	01739849240
21	अश्विन - अग्रवाल -	"	01752121156
20	अश्विन - अग्रवाल -	"	01715356712
19	आर्य - अग्रवाल -	"	0171827563636
18	आर्य - अग्रवाल -	"	01737285508
17	आर्य - अग्रवाल -	"	01726378983
16	आर्य - अग्रवाल -	"	01769700956
15	आर्य - अग्रवाल -	"	01312385396
14	अश्विन - अग्रवाल -	"	01798154153
13	आर्य - अग्रवाल -	"	01714363695
12	अश्विन - अग्रवाल -	"	01763872006
11	अश्विन - अग्रवाल -	"	01783057133

Conducted by
A. K. Sen
18-3-2020

Appendix G. - Relevant Legal documents



(বিধি-১০(৬) দ্রষ্টব্য)

নদীর তলদেশ হইতে ড্রেজিং পদ্ধতিতে বালু বা মাটি উত্তোলনের ইজারা চুক্তি ফরম।

মুনুন্দী আওশিক-১৬ (চানপুর) বালুমহালের ড্রেজিং ইজারার চুক্তিপত্র ভূমি মন্ত্রণালয়ের পক্ষে জেলা প্রশাসক/কালেক্টর, জেলা-মৌলভীবাজার (অতঃপর ইজারাদাতা বলিয়া অভিহিত হইবে)।

জেলা প্রশাসক, মৌলভীবাজার।

প্রথম পক্ষ

এবং

জনাব মোঃ হায়দার আলী, পিতা-মৃত মোঃ ইয়াতুর মিয়া, সাং-হামরকোনা, ডাকঘর-আফরোজগঞ্জ, উপজেলা-মৌলভীবাজার সদর, জেলা-মৌলভীবাজার, পেশা-ব্যবসা (অতঃপর ইজারা গ্রহীতা বলিয়া অভিহিত হইবে)।

দ্বিতীয় পক্ষ

এর মধ্যে ১৪২৬ বাংলা সনের জ্যৈষ্ঠ ২৬ তারিখ সম্পাদিত হইলঃ

যেহেতু ইজারাদাতা মৌলভীবাজার জেলার অবস্থিত নিম্ন ডপলিভুক্ত বালুমহাল ও মাটি ব্যবস্থাপনা বিধিমালা, ২০১১ মোতাবেক হাইড্রোগ্রাফিক জরীপে চিহ্নিত স্থানের মালিক।

যেহেতু মৌলভীবাজার জেলার জেলা প্রশাসক (কালেক্টর) উক্ত প্রস্তাব গ্রহণ করিয়া ১৪২৬ বাংলা সনের দফল দানের তারিখ হইতে ৩০শে চৈত্র ১৪২৬ পর্যন্ত সময়ের জন্য-১৪,০০,০০০/- (চৌদ্দলক্ষ) টাকার ইজারা প্রদানে সন্মত হইয়াছেন।

সেহেতু এখন ইজারাগ্রহীতা কর্তৃক তফসিলে বর্ণিত এবং হাইড্রোগ্রাফিক জরীপে চিহ্নিত বালুমহাল ২৬ জ্যৈষ্ঠ ১৪২৬ বাংলা তারিখ হইতে ৩০শে চৈত্র ১৪২৬ পর্যন্ত সময়ের জন্য নিম্ন বর্ণিত শর্তে ইজারা গ্রহণে স্বীকৃত হওয়ায় এবং ইজারামূল্য বাবদ সর্বমোট ১৪,০০,০০০/- (চৌদ্দলক্ষ) টাকা পরিশোধ করায় ইজারাদাতা ইজারা গ্রহীতার সহিত নিম্নোক্ত মর্মে ও শর্তে অঙ্গীকারবদ্ধ হইলেনঃ

১. নৌপথের অবকাঠামোগত পরিবর্তন করা যাইবে না।
২. মাটি কাটবার পর L.L.W/ হইতে পানি সর্বোচ্চ গভীরতা ১২.০০ ফুটের বেশী হইবে না।
৩. নদীর স্বাভাবিক বৈশিষ্ট্য অক্ষুণ্ণ রাখিয়া ১:৩ ঢাল সংরক্ষণ করিয়া বালু বা মাটি উত্তোলন করিতে হইবে এবং কোন স্থানে অস্বাভাবিক গভীরতায় নদী খনন করা যাইবে না।
৪. প্যাস লাইন, ওয়াসার লাইন, ডিএন্ডটি লাইন ক্ষতিগ্রস্ত হলে উত্তোলনকারী নিজ দায়িত্বে ও ব্যয়ে উহা মেরামত করিতে বাধ্য থাকিবেন।
৫. বালু ও মাটি উত্তোলনকালে নৌ-চলাচলের কোন বিঘ্ন সৃষ্টি করা যাইবে না এবং রাত্রিকালে বালু বা মাটি খনন করা যাইবে না।
৬. বালু বা মাটি খননের সময় সড়ক-প্রাথমিক ব্যবস্থা হিসাবে লাল পতাকার প্রদর্শন করিতে হইবে এবং সেখানে নোহলার নির্দিষ্ট সাইন বোর্ড আছে সেই স্থানে খনন করা যাইবে না।

স্বাক্ষর: হায়দার আলী

৭. বালু বা মাটি উত্তোলনের সময় স্থানীয় জনগণের জায়গা জমি ক্ষতিগ্রস্ত করা যাইবে না এবং ক্ষতির সম্মুখীন হইলে ইজারা গ্রহীতা নিজ উদ্যোগে তা সমাধান করিবেন। তাহাতে ইজারাদাতা কোনরূপ হস্তক্ষেপ করিবে না বা দায়ী থাকিবে না।
৮. বালু বা মাটি উত্তোলনকালে কোন প্রকার দূষণকার জল ইজারাদাতা দায়ী থাকিবে না। যে কোন প্রকার ক্ষয়ক্ষতির জন্য ইজারা গ্রহীতা দায়ী থাকিবেন এবং কোন প্রকার ক্ষতিপূরণের দাবী আসিলে ইজারা গ্রহীতাকে তা বহন করিতে হইবে।
৯. বালু উত্তোলন কালে নদীর তীর সংলগ্ন ফসলি জমি বা গ্রামের পরিবেশের কোন রূপ ক্ষতি সাধন করা যাইবে না।
১০. নদীর তীর জমির ঢাল (Slope) যথাযথভাবে সংরক্ষণ করিয়া বালু উত্তোলন করিতে হইবে।
১১. জীব বৈচিত্র্য সংরক্ষণ ও পরিবেশ দূষণমুক্ত রাখিতে হইবে।
১২. বালু উত্তোলনের বিষয়ে সরকার কর্তৃক জারীকৃত সকল সার্কুলার, বিধি বিধান ও আইন সমূহ মানিয়া চলিতে হইবে। বর্ণিত কোন শর্ত ভঙ্গ করিলে জেলা প্রশাসক তৎক্ষণিকভাবে উত্তোলন বন্ধ করিয়া দিবেন এবং ইজারা বাতিল বলিয়া গণ্য হইবে।
১৩. উত্তোলনকৃত বালু বা মাটি কোন অবস্থাতেই নদীর তীরে বা নদীতে ফেলা যাইবে না।
১৪. বালু বা মাটি উত্তোলনের সময় সরকারী, আধাসরকারী, স্বায়ত্বশাসিত ও ব্যক্তি মালিকানাধীন কোন প্রতিষ্ঠান স্থাপন বা অবকাঠামোর কোন ক্ষতি করা যাইবে না। কোন ক্ষতি পূরণের দাবী আসিলে ইজারা গ্রহীতা তা বহন করিবেন।
১৫. ডেজারের মাধ্যমে বালু বা মাটি উত্তোলন শেষে ডেজিং সংক্রান্ত যাবতীয় মালামাল (যেমন-ডেজার, পাইপ ইত্যাদি) ইজারা গ্রহীতা দ্রুত সাইট হইতে সরাইয়া নিতে বাধ্য থাকিবেন।
১৬. প্রস্তাবিত এলাকা হইতে মাটি কাটিবার সময় নৌ-চলোচলের কোন প্রতিবন্ধকতা সৃষ্টি করিতে পারিবে না।
১৭. বালু বা মাটি উত্তোলনের ফলে নদীর তীর যাহাতে ভাংগিয়া না যায় সে দিকে লক্ষ্য রাখিতে হইবে।
১৮. মামলাজনিত বালুমহালতলে মামলা নিষ্পত্তি হওয়ার পর ইজারা গ্রহীতার অনুকূলে ইজারা কার্যক্রম গ্রহণ করা হইবে। এজন্য দেরীতে দখল বুকে পাওয়ার অজুহাত দেখিয়ে পরবর্তীতে মেয়াদ বৃদ্ধির আবেদন সর্বআদালতে অগ্রাহ্য হইবে।
১৯. দরপত্র যে পর্যায়ে বা সময়ে আহবান করা হোক না কেন দখল গ্রহণের পর হইতে ১৪২৬ সনের ৩০শে চৈত্র পর্যন্ত ইজারা বলবত থাকিবে। দখল প্রদানে বা গ্রহণে বিলম্ব হইয়াছে, বাস্তি না হওয়ায় উজান হইতে বালু আসেনি, ছাড়া, পানি প্রবাহে বাধ দেয়ার কারণে বা বাধ না ছাড়ার কারণে বালুমহালে বালু জমা হয়নি এরূপ অজুহাতে ইজারার মেয়াদ বর্ধিত করার আবেদন দাখিল করা যাইবে না। এরূপ আবেদন সর্ব আদালতে অগ্রাহ্য হইবে।
২০. বালুমহালের কোন অংশ পার্শ্ববর্তী দেশের সীমান্তের সন্নিকটে অবস্থিত হলে সেখান হতে বালু উত্তোলন করা যাইবে না। সেখান হইতে বালু উত্তোলন করিতে হইলে সীমান্তরক্ষী বাহিনী (বিজিবি) কর্তৃপক্ষের অনুমতি গ্রহণ করিতে হইবে।
২১. যুক্তি যথেষ্ট সাথে সংযুক্ত হাইড্রোগ্রাফিক জরীপ চার্টের চিহ্নিত স্থানের বাহিরে মাটি উত্তোলন করা যাইবে না।
২২. বর্ণিত কোন শর্ত ভংগ করা হইলে ইজারাদাতা তৎক্ষণিক ভাবে উত্তোলন কার্য বন্ধ করিয়া দিতে পারিবেন এবং তাতে ইজারা বাতিল বলিয়া গণ্য হইবে।

স্বাঃ হুমায়ুন কবীর

Appendix H. - ToR provided by Department of Environment (DoE)

Government of the People's Republic of Bangladesh
Department of Environment
Head Office, E-16 Agargaon
Dhaka-1207
www.doe.gov.bd

Memo No: 22.02.0000.018.72.130.19 · 570

Date: 22/12/2019

Subject: Exemption from IEE and Approval of Terms of Reference (TOR) for EIA of DBL Economic Zone, Moulvibazar Sadar Upazila, Moulvibazar.

Ref: Your Application dated 20/11/2019.

With reference to your application dated 20/11/2019 for the subject mentioned above, the Department of Environment hereby gives Exemption from IEE and Approval of Terms of Reference (TOR) for EIA of DBL Economic Zone, Moulvibazar Sadar Upazila, Moulvibazar subject to fulfilling the following terms and conditions:

- I. The project authority shall conduct a comprehensive Environmental Impact Assessment (EIA) study considering the overall activity of the said project in accordance with this ToR and following additional suggestions.
- II. The EIA report should be prepared in accordance with following indicative outlines :
 - Executive summary
 1. Introduction: (Background, brief description, rationale of the project, scope of study, methodology, limitation, EIA team, references)
 2. Legislative, regulation and policy consideration (covering the potential legal, administrative, planning and policy framework within which the EIA will be prepared)
 3. Project Description
 - i. Introduction
 - ii. Project Objective
 - iii. Project Options
 - iv. Interventions under Selected Options
 - v. Project activities: A list of the main project activities to be undertaken during site clearing, construction as well as operation
 - vi. Project schedule: The phase and timing for development of the project
 - vii. Resources and utilities demand: Resources required to develop the project, such as soil and construction material and demand for utilities (water, electricity, sewerage, waste disposal and others), as well as infrastructure (road, drains, and others) to support the project
 - viii. Map and survey information
Location map, cadastral map showing land plots (project and adjacent area), geological map showing geological units, fault zone, and other natural features.
 - ix. Project Plan, Design, Standard, Specification, Quantification, etc.
 - 4 Environmental and Social Baseline
 - 4.1 Meteorology
 - 4.1.1 Temperature
 - 4.1.2 Humidity
 - 4.1.3 Rainfall
 - 4.1.4 Evaporation

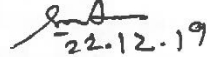
- 4.1.5 Wind Speed
- 4.1.6 Sun Shine Hours
- 4.2 Air Quality and Noise
 - 4.2.1 Ambient Air Quality of the project site with respect to Standards of ECR, 1997
 - 4.2.2 Ambient Noise level of the project site with respect to Standards of Noise Pollution (Control) Rules, 2006
 - 4.2.3 Air pollutant and noise sources from existing and known sources
- 4.3 Water Resources
 - 4.3.1 Surface Water System
 - 4.3.2 Tropical Cyclones and Tidal Flooding
 - 4.3.3 Salinity
 - 4.3.4 Drainage Congestion and Water Logging
 - 4.3.5 Erosion and Sedimentation
 - 4.3.6 River Morphology
 - 4.3.7 Navigation
 - 4.3.8 Ground Water System
- 4.4 Land Resources
 - 4.4.1 Agro ecological Regions
 - 4.4.2 Land Types
 - 4.4.3 Soil Texture
 - 4.4.4 Land Use
- 4.5 Agriculture Resources
 - 4.5.1 Farming Practice
 - 4.5.2 Cropping Pattern and Intensity
 - 4.5.3 Cropped Area
 - 4.5.4 Crop Production
 - 4.5.5 Crop Damage
 - 4.5.6 Main Constraints of Crop Production
- 4.6 Livestock and Poultry
 - 4.6.1 Feed and Fodder Shortage
 - 4.6.2 Livestock/Poultry Diseases
- 4.7 Fisheries
 - 4.7.1 Introduction
 - 4.7.2 Problem and Issues
 - 4.7.3 Habitat Description
 - 4.7.4 Fish Production and Effort
 - 4.7.5 Fish Migration
 - 4.7.6 Fish Biodiversity
 - 4.7.7 Fisheries Management
- 4.8 Ecological Resources
 - 4.8.1 Bio-ecological Zone
 - 4.8.2 Common Flora and Fauna
 - 4.8.3 Ecosystem Services and Function
- 4.9 Socio Economic Condition
 - 4.9.1 Socio Economic Condition



- 4.9.2 Quality of Life Indicators
- 4.9.3 Income and Poverty
- 4.9.4 Gender and Women
- 4.9.5 Common Property Resources
- 4.9.6 Conflict of Interest and Law and Order Situation
- 4.9.7 Historical, Cultural and Archaeological Sites
- 5 Identification and Analysis of Key Environmental Issues (Analysis shall be presented with Scenarios, Maps, Graphics, etc. for the Case of Anticipated Impacts on Baseline)
 - 5.1 Environmental Sensitivity Investigation
 - 5.2 Environmental Asset
 - 5.3 Environmental Hot Spots
 - 5.4 Likely Beneficial Impacts
 - 5.5 Community Recommendations
 - 5.6 Alternate Analysis
- 6 Environmental and Social Impacts
 - 6.1 Introduction
 - 6.2 Impact on Air Quality and Noise
 - 6.2.1 Pre-Construction Phase
 - 6.2.2 Construction Phase
 - 6.2.3 Post-Construction Phase
 - 6.3 Impact on Water Resources
 - 6.3.1 Pre-Construction Phase
 - 6.3.2 Construction Phase
 - 6.3.3 Post-Construction Phase
 - 6.4 Impact on Land Resources
 - 6.4.1 Pre-Construction Phase
 - 6.4.2 Construction Phase
 - 6.4.3 Post-Construction Phase
 - 6.5 Impact on Agriculture Resources
 - 6.5.1 Pre-Construction Phase
 - 6.5.2 Construction Phase
 - 6.5.3 Post-Construction Phase
 - 6.6 Impact on Fisheries
 - 6.6.1 Pre-Construction Phase
 - 6.6.2 Construction Phase
 - 6.6.3 Post-Construction Phase
 - 6.7 Impact on Eco System
 - 6.7.1 Pre-Construction Phase
 - 6.7.2 Construction Phase
 - 6.7.3 Post-Construction Phase
 - 6.8 Socio Economic Impact
 - 6.8.1 Pre-Construction Phase
 - 6.8.2 Construction Phase
 - 6.8.3 Post-Construction Phase
- 7 Public Consultation and Disclosure
 - 7.1 Introduction



- 7.2 Objectives of Public Consultation and Disclosure Meeting
- 7.3 Approach and Methodology of Public Consultation and Disclosure Meeting
- 7.4 Public Consultation Meetings (PCMs)
- 7.5 Public Disclosure Meetings (PDMs)
- 8 Environmental Management Plan and Monitoring Indicators
 - 8.1 Introduction
 - 8.2 Mitigation Plan
 - 8.3 Enhancement Plan
 - 8.4 Contingency Plan
 - 8.5 Compensation Plan
 - 8.6 Monitoring Plan
 - 8.7 Monitoring Indicators
- 9 Cost Estimation for Environmental Mitigation Measures and Monitoring
- 10 Emergency Response Plan & disaster Impact Assessment
- 11 Conclusions and Recommendations
- III. Without obtaining approval of EIA report by the Department of Environment, the project authority shall not be allowed to conduct earth filling or any kind of physical intervention in the proposed project site and also not be able to start the physical activity of the project.
- IV. This approval of the Terms of Reference (TOR) would not mean any acceptance or site clearance of the project.
- V. The proposed EIA study would not establish any claim, right in favor of the proponent for getting site clearance or environmental clearance.
- VI. Without obtaining Environmental Clearance, the project authority shall not be able to start the operation of the project.
- VII. The project authority shall submit the EIA report along with the filled-in application for Environmental Clearance in prescribed form, the feasibility study report, the applicable Environmental Clearance fee in a treasury chalan, the applicable VAT on clearance fee in a separate treasury chalan, the No Objection Certificate (NOC) from local authority, NOC in favor of Cutting/Dressing (if it is required) of Hill/Hillock from the concerned authority and NOC from other relevant agencies for operational activity etc. to the Moulvibazar District Office of DOE in Moulvibazar with a copy to the Head Office of DOE in Dhaka.


 22.12.19
 (Syed Nazmul Ahsan)
 Director (Environmental Clearance)
 Phone # 02-8181673

Managing Director
 DBL Economic Zone Limited
 Capita South Avenue Tower
 House-50 (6th floor), Road-3
 Gulshan-1, Dhaka.

Copy Forwarded to :

- 1) PS to Secretary, Ministry of Environment, Forest and Climate Change, Bangladesh Secretariat, Dhaka.
- 2) Director, Department of Environment, Sylhet Divisional Office, Sylhet.
- 3) Assistant Director, Department of Environment, Moulvibazar District Office, Moulvibazar.
- 4) Assistant Director, Office of the Director General, Department of Environment, Head Office, Dhaka.

Appendix I. - Project Implementation Unit (PIU) Organogram



Organogram_CM_D
IPL.pdf

Appendix J. - STP Design



100 KLD STP1.pdf



150 KLD STP
layout1.pdf

Appendix K. - ETP Design



ETP -Tiles
factory.pdf



ETP-Sanitary
ware.pdf



ETP-accessories.pdf

Appendix L. - Drainage Network



Sewerage Disposal Rainwater Disposal
Route Plan_06 01 20Route Plan_06 01 20

Appendix M. - Letter of Allotment



LOA.pdf