PLEASE Project
Plastic Free Rivers and Seas for South Asia

South Asia Co-operative Environment Programme (SACEP) Plastic free Rivers and Seas for South Asia (P171269)

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) OF RECYCLING BUSINESS UNITS - COXS BAZAR

GRANTEE: BANGLADESH PETROCHEMICAL COMPANY LIMITED - BANGLADESH

Implemented by: SACEP
Supported by: UNOPS
Supported by: WORLD BANK GROUP

Environmental and Social Management Plan (ESMP)-Cox's Bazar RBU
Bangladesh Petrochemical Company Ltd (BPCL)

1. Subproject Information

Subproject Title:	Formalization of Plastic Recycling Value Chain by Forming Recycling Business Units in Cox's Bazar
Estimated Cost:	USD1,322,000
Start/Completion Date:	22 September 2023 - 31 January 2025

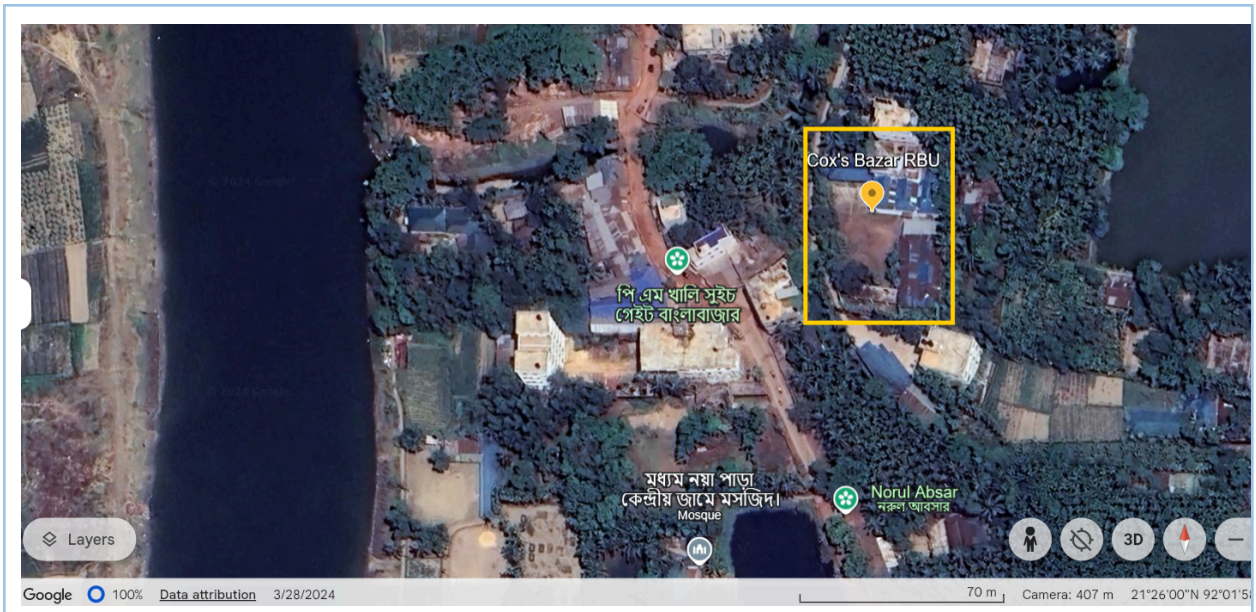
2. Site/Location Description

The proposed land for the Recycling Business Unit (RBU) is located in the Bangla Bazar area, P M Khali Union, within Cox's Bazar District in the Chattogram Division of Bangladesh. Positioned at 21° 26 '00"N, 92° 02' 02"E, this site is approximately 7 kilometers from the Bay of Bengal. It is accessible via a 20-foot-wide road, located 550 meters south of the main road, enabling transportation of large trucks.

The site spans approximately 23.54 decimal and is surrounded by a blend of residential and commercial zones. The Bakkhali River flows toward the Bay of Bengal about 250 meters to the west of the site, with a narrow canal running adjacent to the western side. The northern and eastern areas feature a residential village, small markets, agricultural fields, mainly paddy (Oryza sativa), and green spaces.

Cox's Bazar experiences a coastal climate similar to other regions in Bangladesh, though it is subject to a more intense southwest monsoon due to its proximity to the coast. The area's annual average temperature ranges from a maximum of 30.1 °C (86.2 °F) to a minimum of 22.0 °C (71.6 °F). Average annual rainfall is 3,524 mm (138.7 inches), and the humidity level averages 80 percent.

The selected plot previously served as an abandoned flour mill, featuring a 3,150-square-foot tin-roofed brick structure, which includes a 630-square-foot power room. Additionally, there is a 1,755-square-foot open area without a roof, along with a 5,100-square-foot brick-surfaced yard at the front that includes a 588-square-foot section with bushes. The total area designated for the plastic recycling business is 10,258 square feet. The entire site is enclosed by a 7-foot-high, 467-foot-long brick boundary wall. A 440V three-phase power line, connected via the Rural Electrification Board (REB), is in place, though it is currently inactive.



(Refer to Link-1 for a map of the land location and Link-2 for detailed information on Cox's Bazar, including population data, livelihoods, and institutional details.)

3. Subproject Description and Activities

The main function of the Recycling Business Unit (RBU) is to collect PET from local informal waste pickers and scrap dealers, process it on-site, and transport it to BPCL's main factory for recycling.
The project activities on-site are divided into two phases:

Construction Phase:

1. Clearing approximately 95% bushes except large trees and cleaning the surface, then earth cutting and filling with sand to 2325 square feet with a depth of 2.5 ft.
2. Repair the big shade 3445 square feet by re-plastering, changing unusable parts of the shade, retrofitting of the existing doors and ventilation system. Construct another shade of 2077 sqft including a child care facility of 200 sq ft, a office room 300 sq ft, two separate toilets for male and female each 25 sq ft, a lobby 32 sq ft and rest of the area will be utilized for the water treatment plant where the 284sqft of constructed sedimentation tank. All the two buildings are made with brick structure having tin shade.
3. Construction of a drainage system extending 143 ft. and a water treatment plant with a capacity of 1.5-2 cubic meters per hour. The outlet of the treated water is the natural canal that exists nearby. The treatment plants include three constructed sedimentation chambers, one sand filter, one chemical dosing system, two centrifugal pumps and two water storage tanks.
4. Installation of the required machinery, including one conveyor bales, one label remover, one PET crusher, one screw loader, one floating washer, two baling machines, and one blade sharpening machine.
5. A 500KVA-400KW electrical wiring to support operation of the machines and plumbing of all necessary pipe, fittings and fixtures.

Operational Phase:

1. Waste Plastic Receiving and Sorting - All types of PET and non-PET plastics except pesticides and medical plastic waste are received from informal waste pickers and scrap dealers. The plastics are first sorted by PET and non-PET materials, and then further sorted by color.
2. Label Removal, Crushing, and Washing- The sorted plastics are fed into a label remover to separate non-recyclable wrappers. The plastics are then shredded into PET flakes (12-14mm) by a crushing machine to increase surface area, making them easier to clean. The flakes are then washed with cold water and machine dried.
3. Packing and Transportation- The dried PET flakes are packed and transported to BPCL's main factory, where they are further processed into high-quality, food-grade PET resin in accordance with ISO 9001 standards.
4. operation of Wastewater Treatment and Reuse- Wastewater from the process is directed to a sedimentation tank for particle settling. It then passes through a sand filtration tank to remove fine particles and is stored in a clean water tank. The clean water is then pumped to a reservoir, where it can be either drained or reused in the washing line.

An estimated 1.5 m^3 of water is required for operating the washing line per ton of PET processed. Approximately 1-5% of the total input material results in waste generation, including non-recyclable wrappers, plastics, and dirt. The electricity required for processing PET, including label removal, crushing, washing, and drying, is estimated at 70 kWh per ton of PET processed.

4. ESMP Matrix: Risk and Impacts, Mitigation, Monitoring

4.1 Construction Stage:

Anticipated E&S Risks & Impacts	Risk Mitigation & Management Measures	Impact Mitigation		Impact/Mitigation Monitoring		
		Location/Timing/ Frequency	Responsibility	Aspects / Parameters to be monitored	Methodology, including Location & Frequency	Responsibility
Soil erosion and disturbance due to removal of bushes, grasses and vegetation, earth cutting and settlement activities.	I. Revegetation of 50 medicinal plants by replanting near the hub II. The design of the building and landscape will be optimized to mitigate soil erosion and manage sedimentation.	500-meter area surrounding the RBU will be monitored for a period of 3 months	BPCL and CDIP	The growth of the planted trees, along with their survival rate	Monthly site Visit/Photo evidence Regular Monitoring	Technical expert (environment) country team and PIU and UNOPS Colombo team and BPCL
Air pollution results from activities such as soil excavation, land preparation, shade repairs, loading and unloading of construction materials, and machinery installation. Without adequate controls, these activities can significantly affect air quality, potentially posing health risks to both workers and	I) Dust in surrounding areas will be controlled by water spraying as needed. II) Appropriate safety gear will be provided to protect workers handling waste. III) Regular maintenance of all machinery will be conducted to minimize emissions and ensure efficient operation.	Periodic on-site inspections will be conducted throughout land clearing, earthworks such as filling and compaction, as well as during fabrication and transportation, with inspections occurring every	Site Engineer in Charge and BPCL	Workers with appropriate PPE during all tasks. A complaint box will be available on-site and action taken history	Monthly site visits will be conducted, accompanied by photo documentation as evidence.	Technical expert (environment) country team and PIU and UNOPS Colombo team and BPCL

Anticipated E&S Risks & Impacts	Risk Mitigation & Management Measures	Impact Mitigation		Impact/Mitigation Monitoring		
		Location/Timing/ Frequency	Responsibility	Aspects / Parameters to be monitored	Methodology, including Location & Frequency	Responsibility
surrounding communities.	IV) Although the site is located in an abandoned factory area, a complaint box will be installed to address any community concerns.	two weeks during the construction phase.				
Noise and vibration from activities such as brick crushing, RCC mixing, excavation, material handling, and heavy machinery operations may create a public nuisance. Additional noise and vibration from repair work and installing structural elements like roofs, windows, and ceilings could further disturb the surrounding environment.	I) Construction activities will be restricted to daytime hours to minimize disturbances to the surrounding community. II) Noise levels at the site boundary will be maintained below 75dB(A) during the day, in accordance with the Bangladesh Noise Pollution (Control) Rules 2006. III) Low-noise equipment will be selected and utilized to reduce noise emissions. IV) Regular noise level monitoring will be conducted on-site to ensure compliance with noise control measures.	During intermittent daytime activities throughout the three-month construction period. This includes brick crushing, RCC mixing, excavation, material handling, and heavy machinery operations, particularly during the installation of structural elements like roofs, windows,	Site Engineer in Charge and BPCL	Noise monitoring records Action taken if any complain raise	Monthly site visits will be conducted, accompanied by photo documentation as evidence.	Technical expert (environment) country team and PIU and UNOPS Colombo team and BPCL

Anticipated E&S Risks & Impacts	Risk Mitigation & Management Measures	Impact Mitigation		Impact/Mitigation Monitoring		
		Location/Timing/ Frequency	Responsibility	Aspects / Parameters to be monitored	Methodology, including Location & Frequency	Responsibility
		and ceilings.				
Soil and water contamination, along with potential mosquito breeding, due to the generation of wastewater during construction.	I) Construction wastewater will be directed to a dedicated sedimentation pit to prevent soil and water contamination. II) The sedimentation pit and surrounding areas will be cleaned daily to remove potential mosquito breeding sites. III) Drainage channels will be maintained to ensure proper water flow and prevent stagnation. IV) Mosquito repellents and larvicides will be applied to stagnant water areas as needed.	On-site, specifically around the sedimentation pit and water channels, throughout the entire construction period (3 months).	Site Engineer in Charge and BPCL	Physical observation records	Daily process inspections Monthly site visit	Technical expert (environment) country team and PIU and UNOPS Colombo team and BPCL
Risk of physical injury and psychological stress related to the health and safety of workers during construction, electrical wiring, and machinery setup.	I. Equip all workers with necessary personal protective equipment (PPE), including helmets, gloves, safety boots, goggles, and high-visibility vests to reduce the risk of physical injuries. II. Implement strict safety protocols for all electrical wiring	On site during construction (3 Months).	Site Engineer in charge and Contractor	Wearing PPE during construction activities Availability of First Aid box , Accident	Daily inspection Monthly Site visit By country team and photo evidences	Technical expert (environment) country team and PIU and UNOPS Colombo team and BPCL

Anticipated E&S Risks & Impacts	Risk Mitigation & Management Measures	Impact Mitigation		Impact/Mitigation Monitoring		
		Location/Timing/ Frequency	Responsibility	Aspects / Parameters to be monitored	Methodology, including Location & Frequency	Responsibility
	activities. III. Ensure accessible first aid kits are available on-site. IV. Provide proper sanitary facilities and access to safe drinking water. V. Offer adequate, well-ventilated workspaces, clean eating areas, and separate sleeping areas (if necessary) for workers' comfort and well-being.			register Daily checking of water accumulated places and cleaning	Daily records indicating the discussed and site examination records Photos/ physical checking	
Social and health impacts related to worker hygiene and sanitation conditions	I. Provide well-maintained sanitation facilities, including hand washing stations, to ensure cleanliness and hygiene. II. Ensure a continuous supply of clean drinking water for workers.	On-site throughout the three-month construction period.	Site Engineer in charge and Contractor	Availability of adequate sanitary facilities Access for safe drinking water	Daily monitoring, Observation during the site visit	Technical expert (environment) country team and PIU and UNOPS Colombo team and BPCL
Psychological, physical, and social risks arising from sexual exploitation and abuse (SEA) and incidents of sexual harassment (SH).	I. Conduct daily briefings for workers on safeguarding and prevention of SEA and SH. II. Appoint a dedicated safeguarding focal point from BPCL to address, manage, and monitor complaints.	On-site throughout the three-month construction period.	Site Engineer in charge and Contractor and Engineering Manager from BPCL	Action taken against complain registered Appointed contract point	Monthly site visit	Technical expert (environment) country team and PIU and UNOPS Colombo team and BPCL

Anticipated E&S Risks & Impacts	Risk Mitigation & Management Measures	Impact Mitigation		Impact/Mitigation Monitoring		
		Location/Timing/ Frequency	Responsibility	Aspects / Parameters to be monitored	Methodology, including Location & Frequency	Responsibility
				and records.		
Potential health issue related to labor influx	I. Conduct awareness sessions on communicable diseases for all workers.	On-site throughout the three-month construction period.	Site Engineer in charge and Contractor	Meetings and awareness records	Monthly site visit	Technical expert (environment) country team and PIU and UNOPS Colombo team and BPCL

4.2 Operational Phase

Anticipated E&S Risks & Impacts	Risk Mitigation & Management Measures	Impact Mitigation		Impact/Mitigation Monitoring		
		Location/Timing/ Frequency	Responsibility	Aspects / Parameters to be monitored	Methodology, including Location & Frequency	Responsibility
Potential water and soil pollution due to wastewater generated from plastic cleaning and washing processes, with risks of contaminating the adjacent canal. Discharge of untreated wastewater, including microplastics and labels, may adversely impact the canal's ecosystem, potentially harming aquatic life and degrading water quality.	I. Install and operate an on-site wastewater treatment plant (WTP) to ensure that all wastewater from the plastic washing line is treated to meet the discharge standards outlined in the Environmental Conservation Rules (ECR) 2023, thus preventing pollution of the canal. II. Routinely monitor and test treated wastewater before discharge to confirm it complies with environmental standards, with additional precautions taken during rainy seasons to avoid accidental runoff into the canal. III. Capture microplastics during the treatment process and securely store them in sealed containers to prevent any	These measures will be implemented on-site with continuous monitoring and testing of treated wastewater throughout the operation phase to ensure compliance with environmental standards (ECR-2023) and protection of the canal ecosystem.	Hub Manager	Water quality testing report for the following parameters: pH, DO (Dissolved Oxygen), BOD (Biochemical Oxygen Demand), COD (Chemical Oxygen Demand), and TDS (Total Dissolved Solids).	Analytical reports of treated water once in 3 month	Technical expert (environment) country team and PIU and UNOPS Colombo team and BPCL

Anticipated E&S Risks & Impacts	Risk Mitigation & Management Measures	Impact Mitigation		Impact/Mitigation Monitoring		
		Location/Timing/ Frequency	Responsibility	Aspects / Parameters to be monitored	Methodology, including Location & Frequency	Responsibility
	release into the environment. IV. Collect labels and other non-recyclable materials separately and store them in sealed containers for safe, controlled disposal, minimizing any chance of leakage or exposure to the canal. V. Regularly inspect and maintain drainage systems and containment structures to prevent accidental spillage or overflow into the canal.					
Depletion of groundwater resources due to water use in the operation of the washing line, wastewater treatment plant (WTP), and sanitation facilities.	I. Implement a water reuse system that recycles treated wastewater from the WTP back into the washing line to significantly reduce the need for groundwater extraction.	On-site, with continuous reuse of treated wastewater in the washing line throughout the operation phase.	Hub Manage	Amount of water reused	Report of total water consumption vs reused water	Technical expert (environment) country team and PIU and UNOPS Colombo team and BPCL

Anticipated E&S Risks & Impacts	Risk Mitigation & Management Measures	Impact Mitigation		Impact/Mitigation Monitoring		
		Location/Timing/ Frequency	Responsibility	Aspects / Parameters to be monitored	Methodology, including Location & Frequency	Responsibility
Public disturbance and potential health risks to workers due to noise and vibration from facility machinery operations.	I. Specify low-noise emission standards as a requirement in the procurement and bidding process for machinery to limit noise generation at the source. II. Maintain noise levels at the site boundary below 75dB(A) during daytime hours, in accordance with the Bangladesh Noise Pollution (Control) Rules 2006. III. Provide personal protective equipment (PPE), including earplugs and noise-canceling earmuffs, for workers exposed to elevated noise levels.	On-site during facility operations and throughout the machinery procurement process, Ongoing measures applied during machine operations.	Hub Manage	Reports, Complain register Noise level at RBU and its periphery area Use of PPE	Examination of Documents/reports/complaints Noise measurement report	Technical expert (environment) country team and PIU and UNOPS Colombo team and BPCL
Health risks from indoor air pollution during plastic processing activities, including sorting and crushing and baling.	I. Assess the adequacy of the existing natural ventilation system to ensure sufficient air circulation during processing activities. II. If natural ventilation is insufficient, install additional mechanical ventilation systems	On-site, continuously during facility operation.	Hub Manage	Exhausted fans are operational, Workers are wearing PPE	Examination of Documents/reports/complaints Health report in focus of respiratory issues Monthly on site visit	Technical expert (environment) country team and PIU and UNOPS Colombo team and BPCL

Anticipated E&S Risks & Impacts	Risk Mitigation & Management Measures	Impact Mitigation		Impact/Mitigation Monitoring		
		Location/Timing/ Frequency	Responsibility	Aspects / Parameters to be monitored	Methodology, including Location & Frequency	Responsibility
	as needed to maintain air quality. III. Provide workers with appropriate personal protective equipment (PPE), such as masks and respirators, to reduce exposure to airborne pollutants.				and observation	
Physical, mental, and hygienic risks associated with the health, safety, and hygiene of workers during operations, including sorting, crushing, baling, treatment, loading, and unloading activities.	I. Provide essential PPE and prepare safety guidelines, accompanied by daily safety briefings for all workers. II. Conduct regular medical check-ups for employees to monitor and maintain their health. III. Offer first aid training and ensure first aid kits are easily accessible on-site. IV. Conduct fire safety training, and install appropriate fire extinguishers, fire hydrants, and clear instruction charts. V. Deliver safety and safeguard protocol training to all	At the Recycling Business Unit, with daily implementation and continuous availability throughout operational activities.	Hub Manage, Gender Focal point and CDIP	Workers wearing PPE during operational activities, Sign board are hanged in workplace, Training Record, Accident register, Availability if	Monthly site visit including physical inspection and record checking as well as consultation with workers	Technical expert (environment) country team and PIU and UNOPS Colombo team and BPCL

Anticipated E&S Risks & Impacts	Risk Mitigation & Management Measures	Impact Mitigation		Impact/Mitigation Monitoring		
		Location/Timing/ Frequency	Responsibility	Aspects / Parameters to be monitored	Methodology, including Location & Frequency	Responsibility
	employees. VI. Implement an accident reporting mechanism to ensure prompt response and management of incidents. VII. Maintain clean and sanitary facilities, including separate washing areas for male and female workers, along with continuous access to safe drinking water.			first aid box and it inventory		
Reduced workforce participation, increased absenteeism, and stress among women workers with child due to lack of adequate childcare support	I. Establish a safe, hygienic childcare center within the business unit to provide dedicated support for workers with young children. II. Employ trained and certified childcare professionals to manage and supervise the facility. III. Equip the childcare center with essential resources, including safe drinking water and educational materials, to	At the Recycling Business Unit (RBU), in a designated area separate from the processing unit, with daily operation and support for workers.	Hub Manage, Child care attendant, CDIP	Child care log book and physical observation once in three months	Report checking	Technical expert (environment) country team and PIU and UNOPS Colombo team and BPCL

Anticipated E&S Risks & Impacts	Risk Mitigation & Management Measures	Impact Mitigation		Impact/Mitigation Monitoring		
		Location/Timing/ Frequency	Responsibility	Aspects / Parameters to be monitored	Methodology, including Location & Frequency	Responsibility
	promote the well-being and development of the children.					
Possibility of social challenges associated with an influx of labor	I. Organize regular worker meetings and awareness sessions focused on communicable disease prevention and health practices. II. Provide education and training on preventing and responding to gender-based violence (GBV). III. Develop a gender action plan and appoint a safeguarding focal point to address and prevent sexual exploitation (SE) and gender-based violence. IV. Prioritize hiring from the local community to reduce social disruption and foster local engagement.	At the Recycling Business Unit (RBU), with ongoing implementation throughout the operational period.	Hub Manage, Gender focal point, CDIP	Availability of meeting and training record, Records on gender awareness, Selection criteria for recruitments	Monthly visit and review the documents	Technical expert (environment) country team and PIU and UNOPS Colombo team and BPCL
Gender discrimination in employment opportunities and wages	I. Develop and enforce non-discriminatory guidelines for recruitment processes and operational practices, ensuring	At the Recycling Business Unit (RBU), with ongoing	Hub Manage, Gender focal point and CDIP	Availability of safeguarding policy and its implementatio	Regular monitoring	Technical expert (environment) country team and PIU and UNOPS Colombo

Anticipated E&S Risks & Impacts	Risk Mitigation & Management Measures	Impact Mitigation		Impact/Mitigation Monitoring		
		Location/Timing/ Frequency	Responsibility	Aspects / Parameters to be monitored	Methodology, including Location & Frequency	Responsibility
	equal treatment across all worker levels. II. Implement policies for equal pay, ensuring that male and female employees receive the same wages for equivalent roles and responsibilities. III. Establish a confidential complaint box to enable workers to report gender-related concerns safely and anonymously.	application throughout all employment practices and operations.		n		team and BPCL

5. Capacity Development & Training

To ensure the successful implementation of the Cox's Bazar Recycling Business Unit (RBU) by Bangladesh Petrochemical Company Ltd (BPCL), comprehensive capacity-building and training programs are necessary. These programs will focus on skill enhancement, health and safety, gender equality, and environmental sustainability.

1. Training on machine operations and procedures, covering the handling of plastic materials, including receiving, sorting, baling, feeding into the washing line, and operating the wastewater treatment plant (WTP).
2. Guidance on water reuse mechanisms, quality control processes, housekeeping practices, and environmental protection standards.
3. Training on safeguard measures, first aid, and emergency preparedness, including regular fire drills and response protocols.
4. Orientation on safe handling and use of personal protective equipment (PPE).
5. Sessions on recognizing, preventing, and responding to sexual exploitation, abuse (SEA), and sexual harassment (SH).
6. Awareness programs focused on preventing gender-based violence (GBV) and implementing response measures.
7. Training on record keeping, log book maintenance, and the management of complaint systems, including the maintenance of the complaint box.
8. Orientation on the importance of sustainable waste management, pollution control, and maintenance of natural resources.

6. Implementation Schedule and Cost Estimates

Item	**Timeline**	**Cost**
1. Mitigation Measures *(Construction Stage)*: Includes noise testing, PPE provision, first aid facilities, social and sanitation facilities, and tree planting to mitigate construction impacts.	July-September 2024	USD 200
2. Machine Installation: Provision of PPE and noise measurement during the setup phase.	August, 2024	USD 150
3. Facility Operation and Management: Controls for noise and vibration, waste management and disposal, fire extinguishers, first aid, emergency control measures, sign boards, social and gender-related initiatives, and PPE.	September, 2024	USD 1150
4. Wastewater Treatment and Analysis: Ongoing treatment and quality analysis of wastewater generated from operations.	October 2024 - January, 2025	USD 550
5. Capacity Development and Training: Completion of training sessions and programs for employees	Up to end of January	USD 250

covering all operational, health, safety, and environmental standards.		

7. Attachments

- Land Agreement
- Trade Licence
- NOC from Local Govt
- Initial Site Survey
- Drawing
- BOQ

IV. Review & Approval

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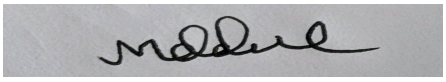
Engr. Aminul Islam Sohan
Position: Project Manager, Bangladesh Petrochemical Company Ltd (BPCL)</td></tr>
<tr><td> 
Reviewed By: Md. Obidul Islam
Position: Project Manager
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Approved By: Kapila Rajapaksha
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