

Semi-Annual Environmental Monitoring Report

(January – June 2023)



ASHUGANJ 400 MW (EAST) COMBINED CYCLE POWER PLANT
At Ashuganj, Brahmanbaria



Ashuganj Power Station Company Limited (APSCCL)

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ABBREVIATION

ADB: Asian Development Bank
AIDs: Acquired Immunodeficiency Syndrome
APSCL: Ashuganj Power Station Company Limited
BoD: Biological Oxygen Demand
CAP: Corrective Action Plan
CCB: Central Control Building
CCPP: Combined Cycle Power Plant
CNTIC: China National Technical Import & Export Corporation
CO: Carbon Mono Oxide
COD: Chemical Oxygen Demand
CW: Cooling Water
DO: Dissolved Oxygen
DoE: Department of Environment
EIA: Environmental Impact Assessment
EMP: Environmental Management Plan
EPC: Engineering Procurement & Construction
FC: Fecal Coliform
GIS: Gas Insulated Switchgear
GRC: Grievance Redress Committee
GRM: Grievance Redress Mechanism
GT: Gas Turbine
GW: Ground Water
HIV: Human Immunodeficiency Virus
HRSG: Heat Recovery Steam Generator
IEE: Initial Environmental Examination
MSDS: Material Safety Data Sheet
MW: Mega-Watt
NOx: Oxides of Nitrogen
PM: Particulate Matter
PPE: Personal Protective Equipment
RMS: Regulating and Metering Station
RP: Resettlement Plan
SEMP: Site Specific Environmental Management Plan
SOx: Oxides of Sulfur
ST: Steam Turbine
TC: Total Coliform
WHO: World Health Organization

EXECUTIVE SUMMARY

1. During the period from January to June 2023, plant was in full operation except May 2023. In previous semi-annual, the major tasks were commissioning and inspection of different equipment, for instance, inspection of warehouse, CEMS, hot commissioning of HRSG, steam turbine, insulation of LP & IP cylinders, inspection of safety valves. In addition to that, commissioning work of the HRSG in cold state, CW system, fire alarm system, air compressor system, DCS control (grid auxiliary transformer electrify), generator end shield opening for insulation treatment, grid auxiliary transformer, plant electricity system, GUST electrify and 400kV GIS system, hot commissioning activities (such as ST hot commissioning/Boiling tuning etc.) have been completed. Performance test was done successfully both in simple and combined cycle mode at different load. Finally, the plant is now commercially operated from 26 November 2022.
2. Air Pollution caused by dust emission during operational traffic activities is controlled by good management practices like continuous water spray over the unpaved or bare surfaces, covering soil materials pile. Soil and water pollutions are also prevented by proper management like spill prevention and well drainage system. Solid waste is managed by the waste management plan. noise pollution is also a regarding the issue during for traffic and transport. Noise level is reduced by proper traffic management system. All personnel use personal protective equipment to ensure their safety. The remarkable achievement in this period is that till now there is no record of loss time accident or injury.
3. Besides this, visual monitoring included dust control, site security, personal protective equipment, incident record and reporting, solid and oily wastes generation and disposal, employee's health, complaints from neighbors, safety orientation and training of employees, sanitation and drinking water facilities to the employees and site drainage is covered during this period and its found that all aspects regarding visual monitoring were found in line with the environmental management plan and required environmental guidelines.
4. APSCL is committed to keeping the accident level in Zero by implementing its proper occupational health and safety management system. This project also has a positive effect on the socio-economic condition. Local skilled and semi-skilled people were engaged in different levels of construction activities and they are happy about getting employment opportunities.
5. On March 8 2020, Bangladesh confirmed three cases of novel coronavirus on its territory. After that, APSCL has been paying close attention to the latest situation of

COVID-19 spreading in Bangladesh and we are currently creating awareness & taking preventive action as a continuous process on this matter. During this critical period, APSCL immediately took the necessary precautions to protect all of its staff against virus infection and has taken immediate action on EPC contractors to prevent the spread of Covid-19 from new project activities like 400 MW CCPP (East) Project by controlling of movement of foreigners, local workers and other construction & maintenance activities of APSCL.

6. APSCL follows WHO & Govt. of Bangladesh guidelines to prevent COVID-19 situation. Besides this, APSCL has taken its own policy to protect its community from COVID-19 and it is also mandatory for EPC contractor of this project to follow APSCL's policy, WHO and Government of Bangladesh guidelines on this issue. EPC contractor is also following its own stringent COVID-19 policy to prevent this disease at the project site.

1.0 INTRODUCTION

- The objective of the environmental safeguard management and monitoring is to record environmental impacts resulting from the project activities and to ensure implementation of the “mitigation measures” identified earlier in order to reduce adverse impacts and enhance positive impacts from specific project activities. Besides, it would also address any unexpected or unforeseen environmental impacts that may arise during construction and operation phases of the project. ADB environmental safeguards objectives are: (i) to ensure the environmental soundness and sustainability of projects and (ii) to support the integration of environmental considerations into the project decision-making process. ADB environmental safeguards are triggered if a project is likely to have potential environmental risks and impacts.

1.1 Location of the Project

- The power plant is setting up at the existing power plant area of Ashuganj Power Station Company Ltd. (APSCCL) at Ashuganj, Brahmanbaria, Bangladesh. Ashuganj is located on the east bank of the Meghna River about 91 km Northeast to Dhaka & is connected by railway & highway way with Dhaka. There also exists good waterway connection to the site by seaports of Chittagong and Mongla. The project is located in Sonaram Mouza of Ashuganj Upazila, Brahmanbaria District. The location map of APSCCL 400 MW (East) is shown in Figure 1. Bangladesh UK Friendship Bridge across the river Meghna (Meghna Bridge) connects both the banks of Bhairab and Ashuganj which connects with Dhaka-Sylhet highway which passes at the south side of the project. Meghna River is in the north side of the project. A khal is situated in the east side of the project and the total APSCCL complex including APSCCL office is located on the west side of the project.

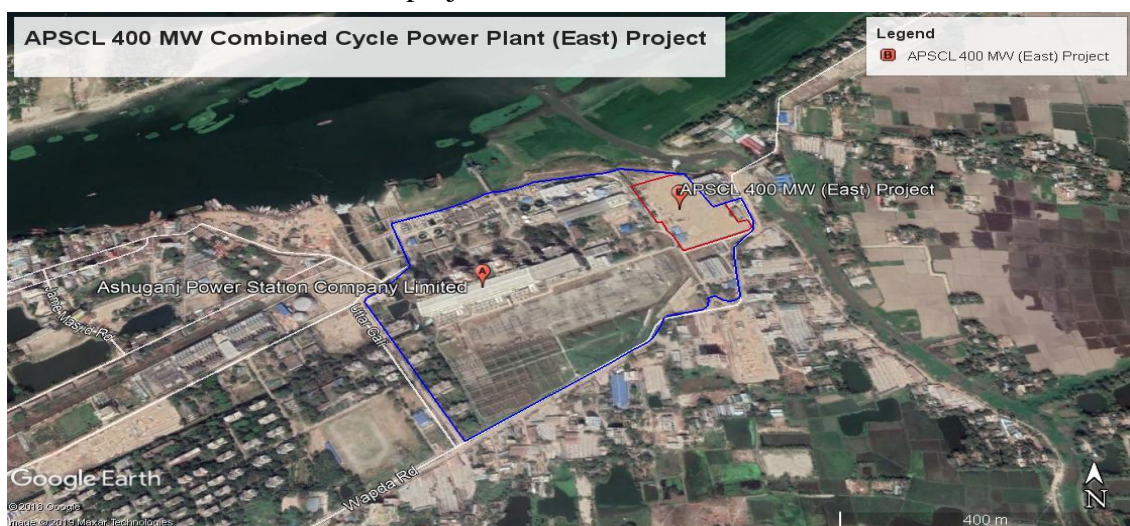


Figure 1: Location Map of APSCCL 400 MW CCPP (East) project

1.2 Context of the monitoring report

9. The present environmental monitoring report period is January to June 2023 to submit as semiannual basis. In this period, analytical monitoring like air quality, noise quality, water quality (surface, ground and drinking) and soil quality are done by APSCL. Besides this, visual monitoring included dust control, site security, personal protective equipment, incident record and reporting, solid and oily wastes generation and disposal, worker's health, complaints from neighbors, safety orientation and training of employees, sanitation and drinking water facilities to the employees and site drainage is covered during this period.

1.3 Project Progress Status

10. APSCL and CNTIC are working so hard to reach the target within the timeframe. 100% of work has been done successfully before this semi-annual. Plant is now commercially operated from 26 November 2022. Performance test was done successfully both in simple and combined cycle mode at different load on 9 December 2022. Majority of work was related to the erection of auxiliary system, structural work of main building, civil work of hydrogen generation station, installation of Main stack, civil work of Control building, equipment installation of gas station etc has been completed.
11. Super structure construction of Bypass stack, Exhaust stack, cooling water, Oily waste water treatment station, Turbine Generator, Air compressor building, Central control Building (CCB), Power control center, Main Building has been completed. Similarly, Installation of equipment & pipe for gas booster and regulating station, RMS, drain water treatment system, site processing and foundation work for emergency Oil pit, sewage treatment station, and unit auxiliary transformer has been completed too.
12. The construction work of auxiliary system erection, GT generator installation, ST installation and electrical system are currently under progress. Commissioning work of the HRSG in cold state, CW system, fire alarm system, air compressor system, DCS control (grid auxiliary transformer electrify), generator end shield opening for insulation treatment, grid auxiliary transformer, plant electricity system, GUST electrify and 400kV GIS system have been completed. Whereas commissioning work of the gas booster regulating station & RMS, GT & ST equipment in cold state, H2 module system has been completed too.
13. A photo index of Ashuganj 400 MW (East) Combined Cycle Power Plant (CCPP) project is attached in Annex I. Updated project progress status is given below in Table 1 & **Figure 2** shows the present site condition of the project.

Table 1: Project Progress Status

SI No.	Task Name	Cumulative Progress July 2018- December 2022	Remarks
1	Design	100%	Plant is now commercially operated from 26 November 2022
2	Procurement	100%	
3	Demolition work of old plant	100%	
4	Construction	100%	
5	Commissioning	100%	



Figure 2: Latest Picture of the Project Site

1.4 Progress status on implementation of environment management activity

14. Progress status on implementation of environmental management activity during operational phase of the project (analytical and visual) is shown in Table 2 and 3.

Table 2: Implementation of Environmental Management Activity during Operational Phase (analytical)

SI No.	Issue	Key aspects	Monitoring Frequency	¹ Compliance status			Remarks
				C	PC	NC	
1.	Ambient air Quality	PM10, PM2.5 SPM, SO _x , NO _x , CO, CO ₂ .	Monthly	√			
2.	River water	Temp., DO, BODs, COD, Oil and Grease and heavy metals (Cr, Cd, Pb)	Monthly	√			

SI No.	Issue	Key aspects	Monitoring Frequency	¹ Compliance status			Remarks
				C	PC	NC	
3.	Groundwater	Ground water level, pH, TDS, Ammonia, Nitrate, Phosphate, As, Fe, Mn and Total Coliforms, Fecal coliform, fecal streptococci, vibrio cholera	Once in 3 months	√			
4.	Soil quality	Cr, Cd, Grease, Pb and Oil and Grease	Once in 12 months	√			
5.	Noise level	Noise at different locations	Monthly	√			
6.	Drinking water	pH, Ammonia, Nitrate, Phosphate, As, Fe, Mn and Total Coliforms, Fecal coliform, fecal streptococci, vibrio cholera	Monthly	√			

C- Compliance, PC- Partially Compliance, NC- Non-Compliance

Table 3: Implementation of Environmental Monitoring Plan during Operational Phase of the Project (Visual)

SI No.	Issue	Key aspects	Monitoring Frequency	¹ Compliance status			Remarks/ Mitigation measures
				C	PC	NC	
1.	Site Security	Proper fencing, isolation of site from general access, marked passage for employees and visitors	Monthly	√			
2.	Personal Protective Equipment	Ensure every single person involved in the operational activity wear proper PPE	Monthly	√			
3.	Incident record & reporting	Documented record of all incident, accident, near misses etc. and its remedial process.	Monthly	√			
4.	Solid waste	Quantity of solid waste, segregation and disposal process	Monthly	√			
5.	Oily waste generation & disposal system	Quantity of oily waste, storage and disposal process	Monthly	√			
6.	Employee's health	Monitoring process of employee's health	Monthly	√			

7.	Grievance redress mechanism	Any significant complain from neighbours and its remedial procedure	Monthly	√			
8.	Safety orientation & training of employees	Frequency of training & orientation of employees for safety	Monthly	√			
9.	Sanitation & drinking water facility to employees	Availability of safe drinking water and sanitation to the employees	Monthly	√			
10.	Site Drainage	Maintaining proper drainage	Monthly	√			Should be kept it clean regularly.

C- Compliance, PC- Partially Compliance, NC- Non-Compliance

1.5 Environmental management implementation work schedule

15. Environmental management implementation work schedule for next six months working plan (July 2023 to December 2023) is shown in Table 4.

Table 4: Environmental Management Implementation work schedule for next six months working plan (July 2023 to December 2023)

SI No.	Works Description	Date					
		4 th July	5 th August	2 nd September	3 rd October	4 th November	2 nd December
1	Ambient Air Quality (2 Locations) & Noise Level (Day & Night)- 2 Locations	4 th July	5 th August	2 nd September	3 rd October	4 th November	2 nd December
2	Ambient Air Quality (2 Locations), Noise Level (Day & Night)-3 Locations	5 th July	6 th August	3 rd September	4 th October	5 th November	3 rd December
3	Ambient Air Quality (1 Locations), Sampling of River Water (3 Locations) and Drinking Water (4 Locations) and on-site test. Visual Monitoring.	6 th July	7 th August	4 th September	5 th October	6 th November	4 th December

1.6 Corrective Action Plan (CAP)

16. A time bound corrective action plan (CAP) is needed for further improvement as per recommendation or mitigation measures. A time bound corrective action plan (CAP) is shown in Table 5 and Figure 3.

Table 5: Implementation of environmental monitoring plan during construction and operational phase of the project (Visual/Analytical)

SI No.	Issue	Mitigation measures	Time
1	Noise from steam blowing	All nearby communities should be informed the time of steam blowing and provide ear plug to the direct exposed people. (15/07/2022)	Immediately
2	Insulated materials were kept open	All insulating materials must be kept covered. (28/07/2022)	Immediately



Figure 3: Implementation of CAP

2.0 ENVIRONMENTAL RESPONSIBILITIES AND INSTITUTIONAL SETUP

17. For ensuring proper implementation of Site Specific Environmental Management Plan (SEMP) role and responsibilities are delegated among persons from both project proponent and contractor at all stages of the project implementation
18. Key SEMP responsibilities are defined and communicated to the relevant stakeholders. Sufficient management sponsorship, human and financial resources are also allotted to achieve effective and continuous SEMP performance.
19. Management of environmental and social impacts during construction period is primary responsibility of the EPC Contractor as per the EPC contract. During the construction phase, APSCL will review and monitor EPC Contractors performance in accordance with the SEMP.

20. The overall Project organizational structure for the implementation of the SEMP is shown in Figure 4 and key roles for implementation and supervision of the SEMP are described in Table 6.

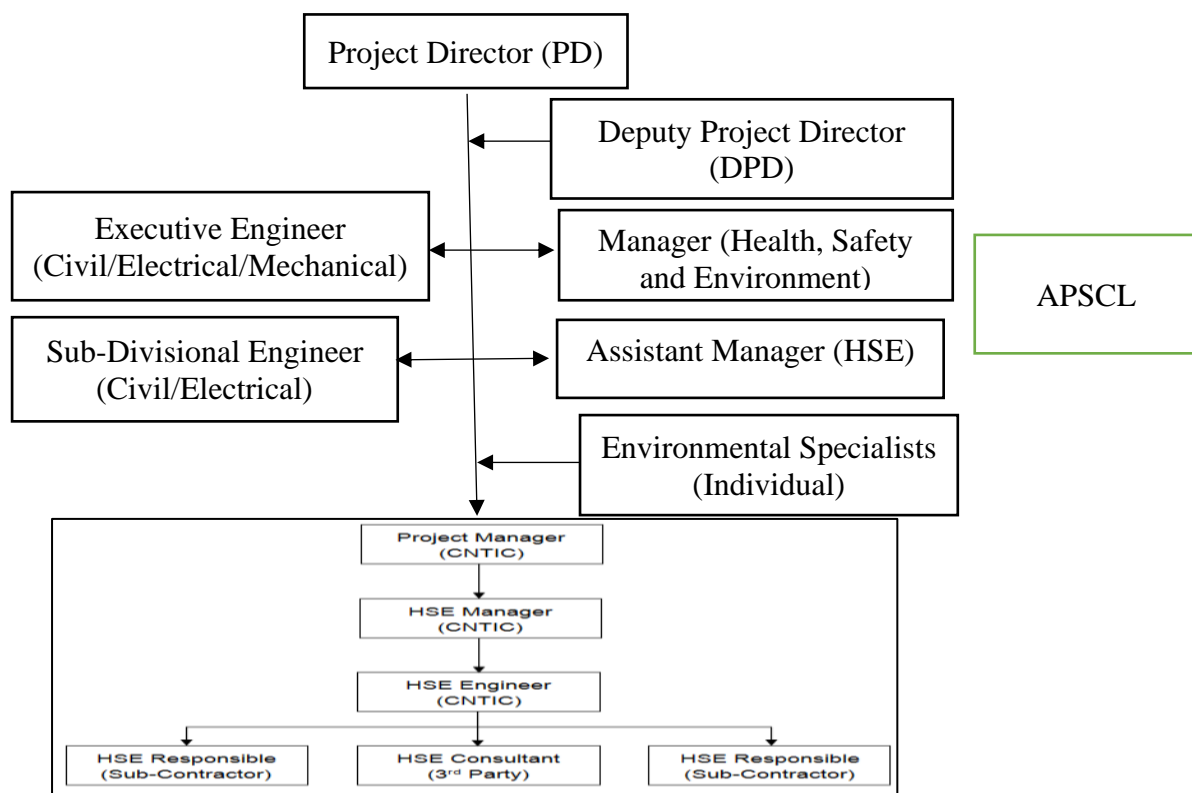


Figure 4: SEMP Organizational Structure

Table 6: Project Environmental Key Personnel, Contact Names and Telephone Numbers

Sl. No.	Project Key personnel	Name of Key personnel	Telephone No.
01	Manager (HSE), 400 MW (East) CCPP, APSC	Md. Atiqur Rahman	01717462670
02	Executive Engineer (Electrical.)	Md. Imrose Islam	01711100873
03	Executive Engineer (Civil.)	Mohammad Asadujjaman	01712238642
05	Assistant Manager (HS&E)	Masfiq Bashir	01731237299

3.0 SAFEGUARD COMPLIANCE PERFORMANCE OF THE PROJECT

3.1 Compliance with the Environmental Provisions of National Legal Instruments

21. Status of Compliance with the environmental provisions of the National Legal Instruments Related to the project are Shown in Table 7.

Table 7: National Legal Instruments Related to the Emergency Assistance Project

Policies, Laws and Regulations	Responsible Agency/Ministry/ Authority	Potential Applicability	Compliance Status
National Environmental Policy, 1992	Ministry of Environment and Forest; Department of Environment	<ul style="list-style-type: none"> ➤ The policy sets out policies to prevent environmental pollution and natural resource degradation. ➤ The Policy states that Environmental Impact Assessments (EIAs) must be conducted before projects are undertaken. 	Complied with: EIA report was prepared and approved by DoE. Annex VIII.
The Environment Conservation Act, 1995	Ministry of Environment and Forest; Department of Environment	<ul style="list-style-type: none"> ➤ According to this law no industrial unit or project shall be established or undertaken without obtaining, in the manner prescribed by rules, an Environmental Clearance Certificate from the Director General. 	Complied with: EIA report was prepared and approved by DoE. ECC was approved on 30 th June 2022.
Environment Conservation Rules, 1997	Ministry of Environment and Forest; Department of Environment	<ul style="list-style-type: none"> ➤ The Rule sets out procedure for issuing Environmental Clearance Certificate. ➤ According to the Rule, proposed project is Red category project and needs to fulfill following requirements <ul style="list-style-type: none"> ❖ Prepare Initial Environmental Examination report. ❖ Report on the Environmental Management Plan (EMP). ❖ Prepare Environmental Impact Assessment report. ❖ Obtain No objection certificate of the local authority. 	Complied with: EIA report was prepared and approved by DoE. ECC was approved on 30 th June 2022. EMP was prepared. Obtain No objection certificate of the local authority and DoE.

Policies, Laws and Regulations	Responsible Agency/Ministry/ Authority	Potential Applicability	Compliance Status
National Land Use Policy, 2001	Ministry of Land	➤ The policy provides guidelines for the protection of agricultural land, water bodies and the optimal use of other land, as well as for restriction or minimization of the acquisition of land for non-productive use.	Complied with. The project area does not involve any land acquisition.
Bangladesh Climate Change Strategy and Action Plan (BCCSAP) 2009	Ministry of Environment and Forest	➤ This strategy prioritizes adaptation and disaster risk reduction. The climate change action plan is built on six pillars. One of them is research and knowledge management to predict the likely scale and timing of climate change impacts on different sectors.	Complied with.
Bangladesh Labour Act 2006	Ministry of Labour and Employment	➤ The Act provides the guidance of employer's extent of responsibility and workmen's extent of right to get compensation in case of injury by accident while working. Provides for safety of work force during construction period.	Complied with. Occupational Health and Safety issues are addressed both in the EMP and Impacts and Mitigation measures are suggested there.
Bangladesh National Building Code, 2006	Ministry of Housing and Public Works	➤ Any planning, design and supervision of construction, repair, maintenance, modification and alteration of buildings, or any other work regulated by the Code shall be certified by a licensed engineer, architect or planner for its compliance with the provision of Code.	Complied with. Clearances from local authorities before start of any construction activity.

3.2 SPS, 2009 compliance status

22. The status of the respective component sub-projects with regard to compliance status to ADB’s policy statement (APS 2009) is shown in Table 8.

Table 8: ADB Safeguards Policy compliance Status for the Projects

ADB Safeguard Policy Statement	Status
Impacts are identified and assessed early in the project cycle	Complied
Plans to avoid, minimize, mitigate, or compensate for the potential adverse impacts are developed and implemented.	Complied
Affected people are informed and consulted during project preparation and implementation	Complied

3.3 Compliance of environmental covenants from the ADB loan agreement

23. Status of Compliance with the environmental provisions of the ADB loan agreement are Shown in Table 9.

Table 9: Compliance with Environmental Considerations of Loan Agreements

Covenants	Reference	Compliance status
Environment		
<p>The borrower shall ensure, or cause APSCCL to ensure, that the preparation, design, construction implementation, operation and decommissioning of the project and all project facilities comply with</p> <p>(a) All applicable laws and regulations of the Borrower relating to the environment, health, and safety;</p> <p>(b) The environmental safeguards;</p> <p>(c)The EARF; and</p> <p>(d) All measures and requirement set forth in the respective EIA, IEE and EMP, and any corrective or preventive actions set forth in a safeguard monitoring report</p>	LA, Schedule 5, Para 2	<p>a) All applicable laws and regulations of the Borrower relating to the environment, health, and safety were followed strictly in the project.</p> <p>b) The environmental safeguards and it’s related all safety measure were maintained in the project. Environmental Quality was monitored and report was submitted each month by EPC which was verified by an independent environmental Consultant to evaluate the environmental and social safeguard policy performance.</p> <p>c) The EARF is followed as per requirements.</p> <p>d) All measures and requirement</p>

		set forth in the respective EIA, IEE and EMP, and any corrective or preventive actions set forth in a safeguard monitoring report is followed and maintained properly and updated time to time.
Covenants	Reference	Compliance status
Land Acquisition and Involuntary Resettlement		
The borrower shall ensure, or cause APSCL to ensure, that all land and all rights-of-way required for the project, and all project facilities are made available to the works contractor in accordance with the schedule agrees under the related works contract and all land acquisition and resettlement activities are implemented in compliance with (a)all applicable laws and regulations of the borrower relating to land acquisition and involuntary resettlement; (b)the involuntary resettlement safeguards; (c)the RF; and (d) All measures and requirement set forth in the respective RP, and any corrective or preventive actions set forth in a safeguards monitoring report.	LA, Schedule 5, Para 3	In the case of APSCL, this type of issues does not arise due to the project location. The project location is inside the premises of APSCL own land. So, there was no requirement of Land Acquisition and Involuntary Resettlement throughout the project period.
Safeguards – Related provisions in bidding documents and works contracts		
The borrower shall ensure, or cause each projects executing agency to ensure, that all bidding documents and contracts for works contain provisions that require the contractor to: (a) Comply with the measures and requirements relevant to the contractor set forth in the EIA, IEE, the EMP, the RP and any small ethnic community	LA, Schedule 5, Para 7	(a) APSCL complied with the measures and requirements relevant to the contractor set forth in the EIA, IEE, the EMP, the RP and any small ethnic community peoples plan (to the extent they concern impacts on affected people during construction), and any corrective or preventive actions set out in a safeguards monitoring report;

<p>peoples plan (to the extent they concern impacts on affected people during construction), and any corrective or preventive actions set out in a safeguards monitoring report;</p> <p>(b) Make available a budget for all such environmental and social measures;</p> <p>(c) Provide the borrower with a written notice of any unanticipated environmental, resettlement or small ethnic community people risks or impacts that arise during construction, implementation or operation of the project that were not considered in the EIA, the IEE, the EMP, the RP or any small ethnic community peoples plan;</p> <p>(d) Adequately record the condition of roads, agricultural and other infrastructure prior to starting to transport materials and construction;</p> <p>(e) Fully reinstate pathways, other local infrastructure, and agricultural land to at least their pre-project condition upon the completion of construction.</p>		<p>(b) Proper budget was allocated for all such environmental and social measures.</p> <p>(c) APSCL followed that properly as per requirements and standard of ADB Social Safeguard Policy.</p> <p>(d) It was maintained as given guideline.</p> <p>(e) It was followed as per requirements.</p>
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Safeguards- Monitoring and Reporting

Covenants	Reference	Compliance status
<p>The borrower shall do the following or shall cause APSCL to do the following:</p> <p>(a) Submit semiannual safeguards monitoring reports to ADB and disclose relevant information from such reports to affected persons promptly upon submission;</p>	<p>LA, Schedule 5, Para 7</p>	<p>a) The proper Safeguards monitoring already being carried out during pre-construction stage and is going on in construction and will be continued for post-construction phase or operation phase.</p> <p>b) It is followed as per the ADB guideline.</p> <p>c) One Environmental Expert is</p>

<p>(b) If any unanticipated environmental and or social risks and impacts arise during construction, implementation or operation of the project that were not considered in the EIA, the IEE, the EMP or the RP, promptly inform ADB of the occurrence of such risks or impacts, with detailed description of the event and proposed corrective action plan;</p> <p>(c) No later than the mobilization of the turnkey contractor for APSCL’s power plant, engage qualified and experienced external experts or qualified non-governmental organizations under a selection process and terms of reference acceptable to ADB, to verify information produced through the project monitoring process, and facilitated the carrying out of any verification by such external experts; and</p> <p>(d) Report any actual or potential breach of compliance with the measures and requirements set forth in the EMP or the RP promptly after becoming aware of the breach.</p>		<p>engaged already, and he is monitoring and giving valuable comments and feedback to APSCL.</p> <p>d) As per SEMP, we will follow the instruction.</p>
Labor standards		
Covenants	Reference	Compliance status
<p>The borrower shall ensure that all works contract documents to be prepared under the project incorporate provisions and budget to the effect that contractors</p> <p>(a) Comply with all applicable labor laws and related international treaty obligations</p>	<p>LA, Schedule 5, Para 10</p>	<p>a) APSCL complies exiting all labor laws and related international treaty obligations of the borrower and not engaged any child labor at the project site.</p> <p>b) APSCL is committed to provide safe working condition both for male and female workers and</p>

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[2.http://www.apscl.gov.bd/site/view/miscellaneous_info/%E0%A6%8F%E0%A6%B8%E0%A6%8F%E0%A6%B8%E0%A6%86%E0%A6%B0%20%E0%A6%AA%E0%A7%8D%E0%A6%B0%E0%A6%A4%E0%A6%BF%E0%A6%AC%E0%A7%87%E0%A6%A6%E0%A6%A8%20\(%E0%A6%8F%E0%A6%A1%E0%A6%BF%E0%A6%AC%E0%A6%BF\)/-](#)

4.0 ENVIRONMENTAL STATUS

25. The APSCL 400 MW (East) project is classified as Environmental Category A as per the ADB’s SPS 2009, as significant impacts are envisioned. The related initial environmental examination (IEE) report, Environmental Impact Assessment Report (EIA) and Site specific Environmental Management Plan (SEMPs) has been prepared in accordance with ADB SPS 2009 requirements for environment category A projects and provide mitigation and monitoring measures, for no envisaged significant impacts, as a result of implementing the project. The environmental mitigation measures, as stipulated in the SEMP’s and in the obtained environmental permit, are monitored during the implementation of the program. The environmental mitigation measures, as stipulated in SEMP’s for the current operational activity were monitored as a part of this EMR (January to June 2023). Environmental compliance report has been prepared based on site visit; sampling analysis and follow up were tracked to observe corrective measures and desired progress. Monitoring locations and Sampling locations map are attached in Annex II and Annex III.
26. Until date, 24 environmental safeguards monitoring visits have been conducted at different times during the current cycle (January to June 2023) of monitoring period. Environmental compliance report has been prepared based on site visit and follow ups were tracked to observe corrective measures and desired progress.

Table 11: List of monitoring visit

	Mission/Task	Date	Location of Site Visits	Conducted by
1.	HSE Observation	04.01.2023	Whole plant area	AM (HS&E)
2.	HSE Observation	12.01.2023	Whole plant area	AM (HS&E)
3.	HSE Observation	17.01.2023	Whole plant area	AM (HS&E)
4.	HSE Observation	30.01.2023	Whole plant area	AM (HS&E)
5.	HSE Observation	02.02.2023	Whole plant area	AM (HS&E)
6.	HSE Observation	08.02.2023	Whole plant area	AM (HS&E)
7.	HSE Observation	14.02.2023	Whole plant area	AM (HS&E)
8.	HSE Observation	23.02.2023	Whole plant area	AM (HS&E)
9.	HSE Observation	04.03.2023	Whole plant area	AM (HS&E)
10.	HSE Observation	12.03.2023	Whole plant area	AM (HS&E)

	Mission/Task	Date	Location of Site Visits	Conducted by
11.	HSE Observation	20.03.2023	Whole plant area	AM (HS&E)
12.	HSE Observation	29.03.2023	Whole plant area	AM (HS&E)
13.	HSE Observation	01.04.2023	Whole plant area	AM (HS&E)
14.	HSE Observation	12.04.2023	Whole plant area	AM (HS&E)
15.	HSE Observation	17.04.2023	Whole plant area	AM (HS&E)
16.	HSE Observation	30.04.2023	Whole plant area	AM (HS&E)
17.	HSE Observation	06.05.2023	Whole plant area	AM (HS&E)
18.	HSE Observation	11.05.2023	Whole plant area	AM (HS&E)
19.	HSE Observation	22.05.2023	Whole plant area	AM (HS&E)
20.	HSE Observation	30.05.2023	Whole plant area	AM (HS&E)
21.	HSE Observation	01.06.2023	Whole plant area	AM (HS&E)
22.	HSE Observation	12.06.2023	Whole plant area	AM (HS&E)
23.	HSE Observation	18.06.2023	Whole plant area	AM (HS&E)
24.	HSE Observation	25.06.2023	Whole plant area	AM (HS&E)

4.1 Analytical Monitoring and Observations

The monitoring results and observations are described below.

4.1.1 Air Quality Monitoring

27. During the operational phase of the power plant project, the result for ambient air quality monitoring of 24 hours shows the SPM, PM10, PM2.5, concentrations of the ambient air. From the analysis it is observed that the concentration of SPM, PM10, and PM2.5 is within the allowable limit, as in the project area the different small constructions activities, highway traffic movements were being done. So, the SPM and PM10 are found high but within acceptable level during movement of vehicle. The traffic movement by the nearby road contribute to the ambient NOX and SOX emission. However, untreated air emission from the adjacent rice mills also accelerates the concentration of these air emission. PM2.5 is composed of a mixture of primary and secondary particles, Primary particles are emitted directly into the atmosphere and include soil-related particles and carbon particles from fossil fuel combustion, and secondary particles are sulphate, nitrate, organic and elemental carbon, trace elements and ammonium. The project is at Ashuganj in Brahmanbaria district which is unplanned urban and planned industrial area, so the cumulative air pollution is high in this area during the construction period which is now found low pollution level after implementing mitigation measures during its operation period. Ambient Air Quality was monitored by sampling from five different places (Annex I) at Ashuganj 400 MW CCPP (East) and the test results are presented in Table 12.

Table 12: Test Result of Ambient Air Quality

JANUARY 2023								
PARAMETER	DoE (Bangladesh) Standard *	IFC/World Bank Standard	Baseline for L1 (Jan 2015) **	L1	L2	L3	L4	L5
PM 2.5	65 µg/m3	75 µg/m3	57	58.79	56.25	52.54	57.93	53.40
PM 10	150 µg/m3	150 µg/m3	136	102.51	105.08	96.70	101.26	98.38
SPM	NF	NF	297	141.12	143.15	139.97	140.68	139.54
SO ₂	80 µg/m3	125 µg/m3	28	0.50	0.42	0.52	0.49	0.46
NO _x	80 µg/m3	200 µg/m3	33	2.04	1.45	1.96	1.80	1.67
CO	20 mg/m3	NF	2.8	0.00	0.00	0.00	0.00	0.00
FEBRUARY 2023								
PARAMETER	DoE (Bangladesh) Standard *	IFC/World Bank Standard	Baseline for L1 (Feb 2015) **	L1	L2	L3	L4	L5
PM 2.5	65 µg/m3	75 µg/m3	51	56.25	55.55	53.72	58.30	52.48
PM 10	150 µg/m3	150 µg/m3	123	98.48	102.67	94.28	100.51	88.15
SPM	NF	NF	312	137.90	140.40	136.75	138.82	137.20
SO ₂	80 µg/m3	125 µg/m3	30	0.50	0.30	1.00	0.50	0.40
NO _x	80 µg/m3	200 µg/m3	34	1.66	1.20	1.76	1.90	1.25
CO	20 mg/m3	NF	2.6	0.00	0.00	0.00	0.00	0.00
MARCH 2023								
PARAMETER	DoE (Bangladesh) Standard *	IFC/World Bank Standard	Baseline for L1 (Mar 2015) **	L1	L2	L3	L4	L5
PM 2.5	65 µg/m3	75 µg/m3	59	38.00	37.00	39.00	40.00	38.00
PM 10	150 µg/m3	150 µg/m3	97	45.00	47.00	47.00	48.00	46.00
SPM	NF	NF	214	27.00	24.00	23.00	24.00	24.00
SO ₂	80 µg/m3	125 µg/m3	28	0.80	1.00	1.00	1.20	1.00
NO _x	80 µg/m3	200 µg/m3	39	1.20	1.91	1.11	1.29	1.25
CO	20 mg/m3	NF	2.4	0.00	0.00	0.00	0.00	0.00
APRIL 2023								
PARAMETER	DoE (Bangladesh) Standard *	IFC/World Bank Standard	Baseline for L1 (April 2015) **	L1	L2	L3	L4	L5
PM 2.5	65 µg/m3	75 µg/m3	55	54.00	50.00	57.00	51.00	52.00
PM 10	150 µg/m3	150 µg/m3	108	62.00	66.00	71.00	63.00	59.00
SPM	NF	NF	291	36.00	34.00	38.00	42.00	37.00
SO ₂	80 µg/m3	125 µg/m3	27	0.40	0.30	0.20	0.30	0.30
NO _x	80 µg/m3	200 µg/m3	36	1.05	1.01	1.10	1.09	0.92
CO	20 mg/m3	NF	3.2	0.00	0.00	0.00	0.00	0.00
MAY 2023								
PARAMETER	DoE (Bangladesh) Standard *	IFC/World Bank Standard	Baseline for L1 (May 2014)**	L1	L2	L3	L4	L5
PM 2.5	65 µg/m3	75 µg/m3	47	61.00	57.00	58.00	61.00	58.00

PM 10	150 µg/m ³	150 µg/m ³	103	74.00	72.00	71.00	73.00	70.00
SPM	NF	NF	296	26.00	27.00	26.00	28.00	25.00
SO ₂	80 µg/m ³	125 µg/m ³	26	0.10	0.00	0.00	0.01	0.00
NO _x	80 µg/m ³	200 µg/m ³	29	0.05	0.01	0.10	0.09	0.05
CO	20 mg/m ³	NF	2.8	0.00	0.00	0.00	0.00	0.00
JUNE 2023								
PARAMETER	DoE (Bangladesh) Standard *	IFC/World Bank Standard	Baseline for L1 (June 2014)**	L1	L2	L3	L4	L5
PM 2.5	65 µg/m ³	75 µg/m ³	31	58.00	51.00	53.00	54.00	55.00
PM 10	150 µg/m ³	150 µg/m ³	54	64.00	62.00	69.00	71.00	63.00
SPM	NF	NF	181	36.00	31.00	28.00	33.00	29.00
SO ₂	80 µg/m ³	125 µg/m ³	18	0.00	0.01	0.00	0.00	0.00
NO _x	80 µg/m ³	200 µg/m ³	22	0.00	0.00	0.00	0.00	0.00
CO	20 mg/m ³	NF	1.4	0.03	0.01	0.00	0.00	0.00

*The Bangladesh National Ambient Air Quality Standards have been taken from the Air Pollution (Control) Rules' 2022.

**EIA of Ashuganj 400 MW Combined Cycle Power Plant (East) project.

28. **PM_{2.5}**: PM_{2.5} are 2.5 micrometers in diameter or smaller, and can only be seen with an electron microscope. Fine particles are produced from all types of combustion, including motor vehicles, power plants, residential wood burning, forest fires, agricultural burning, and some industrial processes. The test result shows that the values of PM_{2.5} are within the standards.
29. **PM₁₀**: Particle pollution, also called particulate matter or PM, is a mixture of solids and liquid droplets floating in the air. Some particles are released directly from a specific source, while others form in complicated chemical reactions in the atmosphere. PM₁₀ are 2.5 to 10 micrometers in diameter. Sources include grinding operations and dust stirred up by vehicles on roads. From the above table of test results, it is seen that, for all the locations, the values are within the standard.
30. **SO_x**: Sulfur oxides (SO_x) are compounds of sulfur and oxygen molecules. Sulfur dioxide (SO₂) is the pre-dominant form found in the lower atmosphere. It is a colorless gas that can be detected by taste and smell in the range of 1,000 to 3,000 micrograms per cubic meter (µg/m³). Concentration of SO₂ ranges from 0.01 to 1.20 µg/m³ which are within the standard for air quality.
31. **NO_x**: In atmospheric chemistry, NO_x is a generic term for the nitrogen oxides that are most relevant for air pollution, namely nitric oxide (NO) and nitrogen dioxide (NO₂). These gases contribute to the formation of smog and acid rain, as well as tropospheric ozone. For all the location the values of NO_x ranges from 0.01 to 2.04 µg/m³ which is within the standard.

32. **CO:** High levels of carbon monoxide are poisonous to humans and, unfortunately, it cannot be detected by humans as it has no taste or smell and cannot be seen. The main sources of additional carbon monoxide are motor vehicle exhaust and some industrial activities, such as making steel. Cigarette smoking and cooking is the major indoor sources of carbon monoxide. Concentration of CO was within the standard for all the sampling locations.
33. From the analysis of reporting period, it is observed that the concentrations of all these parameters are within the allowable limit according to DoE and IFC/World Bank Standard and baseline data. So, the project construction activities do not hamper the air quality in the project area.

4.1.2 Stack Emission

34. Stack emission measurement during present operational phase is summarized in Table 13 and the total CO₂ emission during the reporting period is showed in Table 14. The CO₂ emission is calculated according to the guidelines for estimation greenhouse gas emission of Asian Development Bank (ADB). Results shows that the project contributes to 28.70% of total carbon emission by APSCL. Mitigation measures as outlined in Table 25 adopted to minimize the possible adverse impacts of project activities on air quality.

Table 13: Stack Emission Record

PARAMETER	LIMITS (PPM)		CONCENTRATION LEVEL PRESENT					
	DoE (Bangladesh) Standard	IFC/World Bank Standard	5 th January 2023 at 13:45 PM	10 th February 2023 at 12:30 PM	21 st March 2023 at 12:15 PM	5 th April 2023 at 13:55 PM	May 2023*	8 th June 2023 at 13:47 PM
Generation (MW)			390 MW	290 MW	401 MW	390 MW	--	250 MW
SO _x	N/A	N/A	For gas-based power plant SO _x measurement is not required by DoE & IFC and therefore there is no measuring option in CEMS.					
NO _x (PPM)	40 ppm	25 ppm	1.80	2.90	1.40	1.60	--	8.20
CO (PPM)	---	---	0.60	1.50	0.50	0.50	--	5.90

*Plant was not in operation in May 2023

Table 14: Monthly CO₂ emission record (in ton)

Month	Gas Consumption (sm ³) by 400 MW CCPP (EAST)	ton CO ₂ Emitted by 400 MW CCPP (EAST)	ton CO ₂ Emitted by All Plants of APSCL	Contribution of 400 MW CCPP (EAST) to the total emission by APSCL (%)
January-2023	38,116,396	81256.53	247396.08	32.84
February-2023	39,089,804	83331.64	235389.39	35.40
March-2023	41,242,500	87920.76	263182.33	33.41
April-2023	15,528,512	33103.68	251431.49	13.17
Average Contribution of 400 MW CCPP EAST to the total emission by APSCL (%)				28.70

4.1.3 Noise Measurement

35. During Operational stage, major source of noise is expected to stem from electricity generation points like turbine, generator and Boiler-HRSG and also to some extent from transport vehicles. The operational phase can be broadly classified into two different groups:

- Machine operation, and
- Breakdown or Schedule Maintenance.

36. The measured noise level in the construction site is summarized in Table 15. From the analysis, it was found that the ambient noise qualities of the Project area were found within the allowable limit of DoE, Bangladesh & IFC Standard and baseline. So, the project construction activities do not hamper the noise quality in the project area.

Table 15: Test Result of Noise Quality

JANUARY 2023								
(LAeq) dBA	DoE (Bangladesh) Standard *	IFC/World Bank Standard	L1	L2	L3	L4	L5	**Baseline Data of EIA Date: 30/4/2015
Day (Min)	75	70	53.9	53.6	51.1	52.4	51.1	69.08
Day(Max)	75	70	54.5	54.2	52.6	53.5	51.8	76.40
Night (Min)	70	70	41.4	42.6	42.6	43.0	42.2	66.60
Night(Max)	70	70	42.3	42.9	43.1	43.4	42.7	69.93
FEBRUARY 2023								
(LAeq) dBA	DoE (Bangladesh) Standard *	IFC/World Bank Standard	L1	L2	L3	L4	L5	**Baseline Data of EIA Date: 30/4/2015
Day (Min)	75	70	53.6	53.7	52.4	52.6	51.4	69.08
Day(Max)	75	70	54.2	54.0	53.2	53.0	52.0	76.40
Night (Min)	70	70	41.0	42.1	42.8	43.4	42.0	66.60
Night(Max)	70	70	41.7	42.8	43.3	43.8	42.5	69.93
MARCH 2023								
(LAeq) dBA	DoE (Bangladesh) Standard *	IFC/World Bank Standard	L1	L2	L3	L4	L5	**Baseline Data of EIA Date: 30/4/2015
Day (Min)	75	70	52.4	51.1	51.2	53.2	50.6	69.08
Day(Max)	75	70	59.5	54.8	56.5	60.1	51.0	76.40
Night (Min)	70	70	42.4	43.0	41.3	44.2	41.4	66.60
Night(Max)	70	70	43.2	43.8	41.5	45.8	41.9	69.93
APRIL 2023								
(LAeq) dBA	DoE (Bangladesh) Standard *	IFC/World Bank Standard	L1	L2	L3	L4	L5	**Baseline Data of EIA Date: 30/4/2015
Day (Min)	75	70	52.5	51.8	51.0	52.8	51.1	69.08
Day(Max)	75	70	58.4	54.0	55.5	60.0	51.7	76.40
Night (Min)	70	70	42.5	43.4	41.5	44.8	42.3	66.60
Night(Max)	70	70	42.8	43.5	42.0	45.5	43.0	69.93
MAY 2023								

(LAeq) dBA	DoE (Bangladesh) Standard *	IFC/World Bank Standard	L1	L2	L3	L4	L5	**Baseline Data of EIA Date: 30/4/2015
Day (Min)	75	70	51.6	51.5	50.0	51.8	51.2	69.08
Day(Max)	75	70	53.5	53.0	52.5	58.0	51.9	76.40
Night (Min)	70	70	41.5	42.0	41.3	44.0	42.2	66.60
Night(Max)	70	70	42.5	42.8	42.0	44.5	42.8	69.93
JUNE 2023								
(LAeq) dBA	DoE (Bangladesh) Standard *	IFC/World Bank Standard	L1	L2	L3	L4	L5	**Baseline Data of EIA Date: 30/4/2015
Day (Min)	75	70	52.7	51.6	51.0	52.5	50.2	69.08
Day(Max)	75	70	53.6	54.0	52.8	58.4	51.6	76.40
Night (Min)	70	70	41.9	42.5	42.4	44.4	42.5	66.60
Night(Max)	70	70	42.8	43.0	42.6	44.6	42.7	69.93

*According to the Department of Environment (Noise Pollution (Control) Rules 2006), the standard for ambient noise level in the industrial zone is 75 and 70 decibels at day & night time respectively.

**EIA of Ashuganj 400 MW Combined Cycle Power Plant (East) project.

37. From the analysis, it was found that the ambient noise qualities of the Project area were found within the allowable limit of DoE, Bangladesh & IFC Standard and baseline. So, the project construction activities do not hamper the noise quality in the project area.

4.1.4 Water Quality Analysis

38. Health, Safety & Environment Division of APSCL has provided pure drinking water at several locations in APSCL plant area that also covers the 400 MW CCPP (East) project to supply pure and safe drinking water to all the employees of this project and also to other employees and visitors of APSCL. Inside the project, drinking water jars are also filled with this pure drinking water for employees' convenience. The drinking, surface and groundwater sample were collected from the supplied drinking water, Meghna River and groundwater. The Meghna River passes through from East to West direction near the project area and there are few industries at the right bank of this river. So, the water of this river is less polluted that was also found from environmental monitoring.

4.1.4.1 Drinking Water Quality Analysis

39. The Drinking Water samples collected from different points as prescribed have been analyzed and shown in Table 16.

Table 16: Drinking Water Quality Test Result

JANUARY 2023							
PARAMETER	DoE (Bangladesh) Standard *	Baseline (24.08.15)**	IFC/World Bank Standard	D1	D2	D3	D4
pH	6.5-8.5	6.8	6.5-8.5	7.66	7.32	7.88	7.49
Ammonia	0.5 mg/l	-	---	<0.01	<0.01	<0.01	<0.01
Nitrate	10 mg/l	-	50 mg/l	1.5	1.4	1.6	1.3
Phosphate	6 mg/l	-	---	<0.04	<0.04	<0.04	<0.04
As	0.05 mg/l	-	0.01 mg/l	<0.003	<0.003	<0.003	<0.003
Fe	0.3 -1 mg/l	0.13	0.3 mg/l	0.40	0.32	0.46	0.34
Mn	0.1 mg/l	-	0.5 mg/l	<0.1	<0.1	<0.1	<0.1
Total Coliform	0/100 ml	0	0/100 ml	0	0	0	0
Fecal Coliform	0/100 ml	0	0/100 ml	0	0	0	0
FEBRUARY 2023							
PARAMETER	DoE (Bangladesh) Standard *	Baseline (24.08.15)**	IFC/World Bank Standard	D1	D2	D3	D4
pH	6.5-8.5	6.8	6.5-8.5	7.62	7.36	7.42	7.20
Ammonia	0.5 mg/l	-	---	<0.01	<0.01	<0.01	<0.01
Nitrate	10 mg/l	-	50 mg/l	1.3	1.2	1.0	1.0
Phosphate	6 mg/l	-	---	<0.04	<0.04	<0.04	<0.04
As	0.05 mg/l	-	0.01 mg/l	<0.003	<0.003	<0.003	<0.003
Fe	0.3 -1 mg/l	0.13	0.3 mg/l	0.38	0.25	0.26	0.30
Mn	0.1 mg/l	-	0.5 mg/l	<0.1	<0.1	<0.1	<0.1
Total Coliform	0/100 ml	0	0/100 ml	0	0	0	0
Fecal Coliform	0/100 ml	0	0/100 ml	0	0	0	0
MARCH 2023							
PARAMETER	DoE (Bangladesh) Standard *	Baseline (24.08.15)**	IFC/World Bank Standard	D1	D2	D3	D4
pH	6.5-8.5	6.8	6.5-8.5	7.68	7.28	7.78	7.60
Ammonia	1.50 mg/l	-	---	<0.01	<0.01	<0.01	<0.01
Nitrate	45 mg/l	-	50 mg/l	1.2	1.3	1.5	1.3
Phosphate	0.1 mg/l	-	---	<0.04	<0.04	<0.04	<0.04
As	0.05 mg/l	-	0.01 mg/l	<0.003	<0.003	<0.003	<0.003
Fe	0.3 -1 mg/l	0.13	0.3 mg/l	0.41	0.35	0.42	0.36
Mn	0.4 mg/l	-	0.5 mg/l	<0.1	<0.1	<0.1	<0.1
Total Coliform	0/100 ml	0	0/100 ml	0	0	0	0
Fecal Coliform	0/100 ml	0	0/100 ml	0	0	0	0

APRIL 2023							
PARAMETER	DoE (Bangladesh) Standard *	Baseline (24.08.15)**	IFC/World Bank Standard	D1	D2	D3	D4
pH	6.5-8.5	6.8	6.5-8.5	7.58	7.51	7.80	7.59
Ammonia	1.50 mg/l	-	---	<0.01	<0.01	<0.01	<0.01
Nitrate	45 mg/l	-	50 mg/l	1.3	1.6	1.4	1.0
Phosphate	0.1 mg/l	-	---	<0.04	<0.04	<0.04	<0.04
As	0.05 mg/l	-	0.01 mg/l	<0.003	<0.003	<0.003	<0.003
Fe	0.3 -1 mg/l	0.13	0.3 mg/l	0.36	0.31	0.42	0.40
Mn	0.4 mg/l	-	0.5 mg/l	<0.1	<0.1	<0.1	<0.1
Total Coliform	0/100 ml	0	0/100 ml	0	0	0	0
Fecal Coliform	0/100 ml	0	0/100 ml	0	0	0	0
MAY 2023							
PARAMETER	DoE (Bangladesh) Standard *	Baseline (24.08.15)**	IFC/World Bank Standard	D1	D2	D3	D4
pH	6.5-8.5	6.8	6.5-8.5	7.62	7.42	7.68	7.56
Ammonia	1.50 mg/l	-	---	<0.01	<0.01	<0.01	<0.01
Nitrate	45 mg/l	-	50 mg/l	1.4	1.2	1.6	1.4
Phosphate	0.1 mg/l	-	---	<0.04	<0.04	<0.04	<0.04
As	0.05 mg/l	-	0.01 mg/l	<0.003	<0.003	<0.003	<0.003
Fe	0.3 -1 mg/l	0.13	0.3 mg/l	0.38	0.36	0.48	0.31
Mn	0.4 mg/l	-	0.5 mg/l	<0.1	<0.1	<0.1	<0.1
Total Coliform	0/100 ml	0	0/100 ml	0	0	0	0
Fecal Coliform	0/100 ml	0	0/100 ml	0	0	0	0
JUNE 2023							
PARAMETER	DoE (Bangladesh) Standard *	Baseline (24.08.15)**	IFC/World Bank Standard	D1	D2	D3	D4
pH	6.5-8.5	6.8	6.5-8.5	7.58	7.51	7.80	7.59
Ammonia	1.50 mg/l	-	---	<0.01	<0.01	<0.01	<0.01
Nitrate	45 mg/l	-	50 mg/l	1.3	1.6	1.4	1.0
Phosphate	0.1 mg/l	-	---	<0.04	<0.04	<0.04	<0.04
As	0.05 mg/l	-	0.01 mg/l	<0.003	<0.003	<0.003	<0.003
Fe	0.3 -1 mg/l	0.13	0.3 mg/l	0.36	0.31	0.42	0.40
Mn	0.4 mg/l	-	0.5 mg/l	<0.1	<0.1	<0.1	<0.1
Total Coliform	0/100 ml	0	0/100 ml	0	0	0	0
Fecal Coliform	0/100 ml	0	0/100 ml	0	0	0	0

*ECR'1997 (before March 2023) & ECR' 2023

**EIA of Ashuganj 400 MW Combined Cycle Power Plant (East) project.

40. **pH:** pH is a measure of the hydrogen ion concentration in water and indicates whether the water is acidic or alkaline. The measurement of alkalinity and acidity of pH is required to determine the corrosiveness of the water. From the test result of the

drinking water, it is observed that pH values are within national standard ranges from 7.20 to 7.88

41. **Arsenic:** Arsenic is a natural component of the earth's crust and is widely distributed throughout the environment in the air, water and land. It is highly toxic in its inorganic form. People are exposed to elevated levels of inorganic arsenic through drinking contaminated water, using contaminated water in food preparation and irrigation of food crops, industrial processes, having contaminated food and smoking cigarettes. The test result shows that the concentration of Arsenic is within the national standards for the project area.
42. **Iron (Fe):** Natural waters contain variable amounts of iron depending on the geological area and other chemical components of the waterway. Iron in groundwater is normally present in the ferrous or bivalent form [Fe⁺⁺] which is soluble. It is easily oxidized to ferric iron [Fe⁺⁺⁺] or insoluble iron upon exposure to air. The concentration of iron is within the national standard for the project area. The value varies between 0.25 and 0.48 mg/l.
43. **Manganese (Mn):** Mn values indicate the general nature of water quality. The values of Mn in all tested drinking water samples are within the Bangladesh Standard for Drinking Water Quality.
44. **Total Coliform (TC):** Total coliforms are a group of bacteria that are widespread in nature. All members of the total coliform group can occur in human feces, but some can also be present in animal manure, soil, and submerged wood and in other places outside the human body. Thus, the usefulness of total coliforms as an indicator of fecal contamination depends on the extent to which the bacteria species found are fecal and human in origin. The values of TC were nil for the project area.
45. **Fecal Coliform (FC):** The presence of fecal coliform bacteria in aquatic environments indicates that the water has been contaminated with the fecal material of man or other animals. Fecal Coliform bacteria indicate the presence of sewage contamination of a waterway and the possible presence of other pathogenic organisms. The values of FC were nil for the project area.
46. From the analysis, it was found that all parameters of drinking water within standard limit of DoE, Bangladesh. Pure drinking water is supplied by HS&E division by six stages purification systems with alkaline RO and UV disinfection system of APSCL water plant. All employees and worker of the project are using the purified water for drinking purpose.

4.1.4.2 River Water Quality Analysis

47. The river water samples collected from different points as prescribed have been analyzed and shown in Table 17.

Table 17: River Water Quality Test Result

JANUARY 2023					
PARAMETER	Baseline Data from EIA (30.4.2015)*	IFC/World Bank Standard	Upstream	Downstream	Outfall
Temperature	38°C	-	21.9	21.6	22.6
Dissolved Oxygen (DO)	7.3 mg/l	-	5.8	6.2	6.0
BOD5	7 mg/l	-	0.3	0.5	3.1
COD	32 mg/l	-	0.6	0.9	2.4
Chromium (Total)	-	-	<0.02	<0.02	<0.02
Cadmium	-	-	<0.002	<0.002	<0.002
Lead (Pb)	<0.05 mg/l	-	<0.05	<0.05	<0.05
Oil & Grease	<5.5 mg/l	-	<1.0	<1.0	<1.0
FEBRUARY 2023					
PARAMETER	Baseline Data from EIA (30.4.2015)*	IFC/World Bank Standard	Upstream	Downstream	Outfall
Temperature	38°C	-	21.8	21.3	22.4
Dissolved Oxygen (DO)	7.3 mg/l	-	6.5	6.2	6.4
BOD5	7 mg/l	-	0.7	0.4	3.8
COD	32 mg/l	-	0.4	0.8	2.8
Chromium (Total)	-	-	<0.02	<0.02	<0.02
Cadmium	-	-	<0.002	<0.002	<0.002
Lead (Pb)	<0.05 mg/l	-	<0.05	<0.05	<0.05
Oil & Grease	<5.5 mg/l	-	<1.0	<1.0	<1.0
MARCH 2023					
PARAMETER	Baseline Data from EIA (30.4.2015)*	IFC/World Bank Standard	Upstream	Downstream	Outfall
Temperature	38°C	-	24.9	24.4	25.4
Dissolved Oxygen (DO)	7.3 mg/l	-	6.4	6.6	6.1
BOD5	7 mg/l	-	0.5	0.5	4.0
COD	32 mg/l	-	0.8	0.7	3.2
Chromium (Total)	-	-	<0.02	<0.02	<0.02
Cadmium	-	-	<0.002	<0.002	<0.002
Lead (Pb)	<0.05 mg/l	-	<0.05	<0.05	<0.05
Oil & Grease	<5.5 mg/l	-	<1.0	<1.0	<1.0
APRIL 2023					
PARAMETER	Baseline Data from EIA (30.4.2015)*	IFC/World Bank Standard	Upstream	Downstream	Outfall
Temperature	38°C	-	27.7	27.4	28.0

Dissolved Oxygen (DO)	7.3 mg/l	-	5.8	6.4	6.4
BOD5	7 mg/l	-	0.8	0.6	3.6
COD	32 mg/l	-	0.9	1.0	3.8
Chromium (Total)	-	-	<0.02	<0.02	<0.02
Cadmium	-	-	<0.002	<0.002	<0.002
Lead (Pb)	<0.05 mg/l	-	<0.05	<0.05	<0.05
Oil & Grease	<5.5 mg/l	-	<1.0	<1.0	<1.0
MAY 2023					
PARAMETER	Baseline Data from EIA (30.4.2015)*	IFC/World Bank Standard	Upstream	Downstream	Outfall
Temperature	38°C	-	35.0	34.8	35.3
Dissolved Oxygen (DO)	7.3 mg/l	-	6.7	7.1	6.6
BOD5	7 mg/l	-	0.9	0.4	3.1
COD	32 mg/l	-	1.0	1.4	2.8
Chromium (Total)	-	-	<0.02	<0.02	<0.02
Cadmium	-	-	<0.002	<0.002	<0.002
Lead (Pb)	<0.05 mg/l	-	<0.05	<0.05	<0.05
Oil & Grease	<5.5 mg/l	-	<1.0	<1.0	<1.0
JUNE 2023					
PARAMETER	Baseline Data from EIA (30.4.2015)*	IFC/World Bank Standard	Upstream	Downstream	Outfall
Temperature	38°C	-	33.6	31.5	35.9
Dissolved Oxygen (DO)	7.3 mg/l	-	7.0	6.8	6.2
BOD5	7 mg/l	-	0.8	0.5	3.4
COD	32 mg/l	-	1.4	1.5	3.1
Chromium (Total)	-	-	<0.02	<0.02	<0.02
Cadmium	-	-	<0.002	<0.002	<0.002
Lead (Pb)	<0.05 mg/l	-	<0.05	<0.05	<0.05
Oil & Grease	<5.5 mg/l	-	<1.0	<1.0	<1.0

* EIA of Ashuganj 400 MW Combined Cycle Power Plant (East) project.

48. **Temperature:** Test result of each of months showing that, plant is discharging cold water compared to the water it is withdrawing from intake at the river
49. **Dissolved Oxygen (DO):** Dissolved oxygen is necessary for life of aquatic inhabitants. Decrease in DO values below the critical level of 3 mg/l causes death of most fishes and other aerobic aquatic organisms.
50. **Biochemical Oxygen Demand (BOD5):** Biochemical Oxygen Demand is supposed to measure the amount of food (or organic carbons) that bacteria can oxidize. The test results indicate the water has lower level of organic content.

51. **Chemical Oxygen Demand (COD):** Chemical Oxygen Demand is the total measurement of all chemicals in the water that can be oxidized. The value of COD was ranges from 0.4 to 3.8 mg/l.

52. From the above analysis result it can be concluded that there is a low negative impact of the project to the aquatic ecosystem.

4.1.4.3 Ground Water Quality Analysis

53. The Ground water samples collected from different points as prescribed have been analyzed and shown in Table 18.

Table 18: Ground Water Quality

JANUARY 2023						
PARAMETER	Baseline Data from EIA (G1) 30.4.2015	DoE/IFCStandard	G1	G2	G3	G4
pH	6.9	-	6.96	7.25	7.02	7.21
TDS	-	-	232	226	241	250
Ammonia	0.35 mg/l	-	<0.01	<0.01	<0.01	<0.01
Nitrate	2.15 mg/l	-	<1.0	<1.0	<1.0	<1.0
Phosphate	3.65 mg/l	-	0.1	0.1	0.1	0.1
As	0.003 mg/l	-	<0.003	<0.003	<0.003	<0.003
Fe	0.4 mg/l	-	0.29	0.29	0.28	0.28
Mn	-	-	<0.1	<0.1	<0.1	<0.1
Total coliform	0/100 ml	-	0	0	0	0
Fecal Coliform	0/100 ml	-	0	0	0	0
APRIL 2023						
PARAMETER	Baseline Data from EIA (G1) 30.4.2015	DoE/IFCStandard	G1	G2	G3	G4
pH	6.9	-	7.16	7.21	7.07	7.34
TDS	-	-	212	238	236	256
Ammonia	0.35 mg/l	-	<0.01	<0.01	<0.01	<0.01
Nitrate	2.15 mg/l	-	<1.0	<1.0	<1.0	<1.0
Phosphate	3.65 mg/l	-	0.1	0.1	0.1	0.1
As	0.003 mg/l	-	<0.003	<0.003	<0.003	<0.003
Fe	0.4 mg/l	-	0.28	0.29	0.28	0.29
Mn	-	-	<0.1	<0.1	<0.1	<0.1
Total coliform	0/100 ml	-	0	0	0	0
Fecal Coliform	0/100 ml	-	0	0	0	0

**EIA of Ashuganj 400 MW Combined Cycle Power Plant (East) project.

54. **pH:** pH is a measure of the hydrogen ion concentration in water and indicates whether the water is acidic or alkaline. The measurement of alkalinity and acidity of

pH is required to determine the corrosiveness of the water. From the test result of the ground water, it is observed that pH value ranges from 6.96 to 7.34.

55. **Arsenic:** Arsenic is a natural component of the earth's crust and is widely distributed throughout the environment in the air, water and land. It is highly toxic in its inorganic form. People are exposed to elevated levels of inorganic arsenic through drinking contaminated water, using contaminated water in food preparation and irrigation of food crops, industrial processes, having contaminated food and smoking cigarettes. The test result shows that the project has no negative influence on Arsenic concentration.
56. **Iron (Fe):** Natural waters contain variable amounts of iron depending on the geological area and other chemical components of the waterway. Iron in groundwater is normally present in the ferrous or bivalent form [Fe⁺⁺] which is soluble. It is easily oxidized to ferric iron [Fe⁺⁺⁺] or insoluble iron upon exposure to air. The concentration of iron varies from 0.28 and 0.29 mg/l.
57. **Manganese (Mn):** Mn values indicate the general nature of water quality. The values of Mn in all tested drinking water samples are within the Bangladesh Standard for drinking Water Quality.
58. **Total Coliform (TC):** Total coliforms are a group of bacteria that are widespread in nature. All members of the total coliform group can occur in human feces, but some can also be present in animal manure, soil, and submerged wood and in other places outside the human body. Thus, the usefulness of total coliforms as an indicator of fecal contamination depends on the extent to which the bacteria species found are fecal and human in origin. The values of TC were nil for the project area.
59. **Fecal Coliform (FC):** The presence of fecal coliform bacteria in aquatic environments indicates that the water has been contaminated with the fecal material of man or other animals. Fecal Coliform bacteria indicate the presence of sewage contamination of a waterway and the possible presence of other pathogenic organisms. The values of FC were nil for the project area

4.1.4.4 Waste Water Quality Analysis

60. Waste water quality analysis result (Table 19) represent that the concentration of discharge water was within DoE standard.

Table 19: Waste Water Quality

WASTE WATER	LIMITS		JANUARY 2023				FEBRUARY 2023				MARCH 2023			
PARAMETER	DoE (Bangladesh Standard *)	IFC/World Bank Standard	WW1	WW2	WW3	WW4	WW1	WW2	WW3	WW4	WW1	WW2	WW3	WW4
pH	6 - 9	6 - 9	7.80	7.80	7.80	7.80	7.67	7.67	7.67	7.67	7.70	7.70	7.70	7.70
TEMPERATURE	Not more than 5°C from Water Body	Not more than 3°C from Water Body	22.9	22.9	22.9	22.9	22.6	22.6	22.6	22.6	26.8	26.8	26.8	26.8
TDS	NF	----	96	96	96	96	54	54	54	54	85	85	85	85
Electrical Conductivity	NF	----	192	192	192	192	108	108	108	108	178	178	178	178
Oil & Grease	10 mg/l	10 mg/l	0.9	0.9	0.9	0.9	1.2	1.2	1.2	1.2	0.8	0.8	0.8	0.8
WASTE WATER	LIMITS		APRIL 2023				MAY 2023				JUNE 2023			
PARAMETER	DoE (Bangladesh Standard *)	IFC/World Bank Standard	WW1	WW2	WW3	WW4	WW1	WW2	WW3	WW4	WW1	WW2	WW3	WW4
pH	6 - 9	6 - 9	7.83	7.83	7.83	7.83	Plant was not in operation				8.77	8.77	8.77	8.77
TEMPERATURE	Not more than 5°C from Water Body	Not more than 3°C from Water Body	28.2	28.2	28.2	28.2					32.7	32.7	32.7	32.7
TDS	NF	----	88	88	88	88					66	66	66	66
Electrical Conductivity	NF	----	176	176	176	176					132	132	132	132
Oil & Grease	10 mg/l	10 mg/l	0.8	0.8	0.8	0.8					0.9	0.9	0.9	0.9

61. **pH:** From the test result of the waste water, it is observed that pH value ranges from 7.67 to 8.77 during the monitoring period.
62. **Temperature:** Temperature of the discharge water is within the DoE standard. Temperature varies from 22.6 to 32.7°C.
63. **TDS:** The test result shows that TDS of waste water value ranges from 54 to 96 mg/l which is within the DoE standard.
64. **Electrical Conductivity:** It is observed that EC value ranges from 108 to 192 Mmho/Cm during the monitoring period.
65. **Oil & Grease:** The test result shows that Oil & Grease of waste water value ranges from 0.8 to 1.2 mg/l which is within the required standard.
66. From the test result, it is observed that pH, temperature, TDS, electricity conductivity and oil and grease values are within national standard ranges.

4.1.5 Soil Quality Analysis

67. Soil is an important component of the environment and also is an integral component of the terrestrial ecosystem providing habitat and a source of food for key components of the food web. Soil quality analysis is done once in annually. Soil samples analysis

determines the concentration of several heavy metal concentrations and result (Table 20) represent that the concentration of three heavy metals were remain below standard.

Table 20: Waste Water Quality

SOIL QUALITY TEST RESULT- MARCH 2023						
PARAMETER	CONCENTRATION PRESENT (ppm)				Canadian Standard values of heavy metals in soil (mgkg ⁻¹)	METHOD OF ANALYSIS
	S1	S2	S3	S4		
Chromium (Total)	6.10	4.80	5.60	5.80	64	AAS
Cadmium	<1.0	<1.0	<1.0	<1.0	10	AAS
Lead (Pb)	1.50	1.50	1.40	1.20	140	AAS
Oil & Grease	<0.5	<0.5	<0.5	<0.5	NF	APHA 5520.B

68. Soil For soil quality analysis there is no standards of DoE. The test result shows that chromium (total) concentration ranged from 4.80 to 6.10 mg/kg, cadmium concentration less than 1.0 mg/kg and another heavy metal lead from 1.20 to 1.50 mg/kg. It is observed that heavy metal concentrations of this monitoring period remain below standard within Canadian Standard values of heavy metals.

69. From the above test results, the project has no negative influence on heavy metal concentration on soil.

4.2 Visual Monitoring and Observations

4.2.1 Dust Control & Plantation

70. Dust poses negative impact of air quality as well as health especially in dry season. To control the dust the project area was swept regularly and sprayed water if necessary (Figure 5) and stock materials were kept covered.

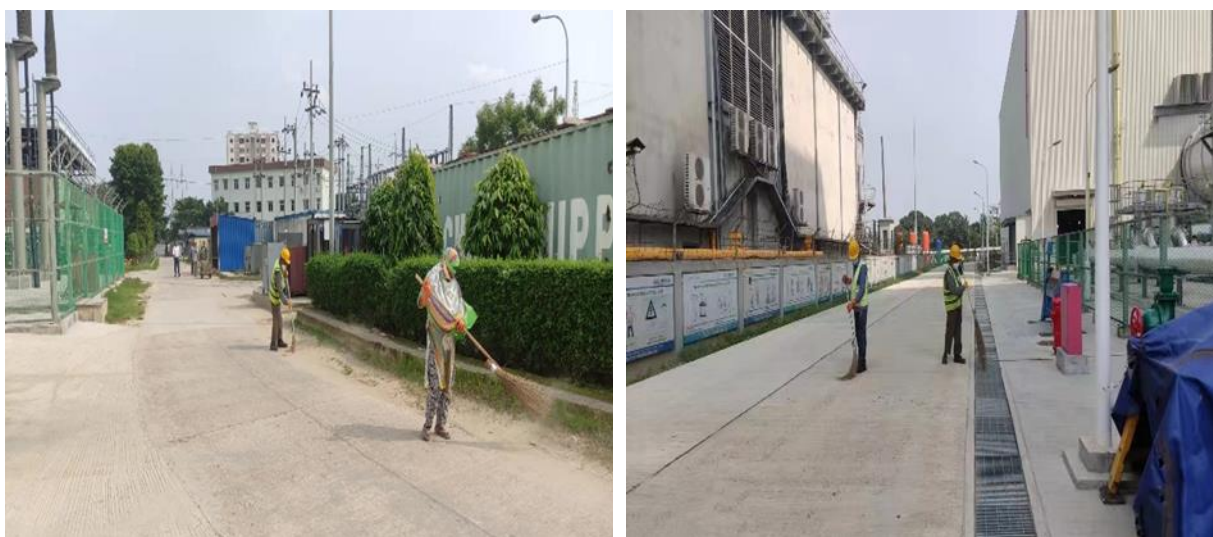


Figure 5: Dust Control in the Plant Area

71. However, the bared soil is covered with carpet grass and different species of plants are implanted (Figure 16) at different locations of the project site.

Table 21: Details of tree planation program done in project site

Tree plantation plan (TPP) prepared (Yes/No)	No. of trees planned to cut	Trees planned to replant as per TPP	Trees removed (if any)	Types of species planted	Trees planted (as of Jun'23)	Plantation completion status	Survival status	Remarks
Yes	0	0	0	Mango	55 Nos	100%	100%	Regular nursing of the plants is going on under HS&E division. In this period no changes have occurred.
				Jackfruit	15 Nos			
				Neem	15 Nos			
				Kamini Flower	150 Nos			
				Krishnachura Flower	25 Nos			
				Palash Flower	3 Nos			
				Cherry	18 Nos			
				Panthopadop	2 Nos			
				Orchid	120 Nos			
				Baganbilash	35 Nos			
				Malotilota	8 Nos			
				PaulowniaTomentosa	4 Nos			
				Candle Boxwood for edging	9000 Nos			
Carpet Grass	On 5000 Sq. ft Land Area.							



Figure 6: Tree Plantation at the Plant Area

4.2.2 Site Security

72. The 400 MW CCPP (East) is situated inside the main power plant which is secured by plant boundary wall. Inside of it, site boundary fencing has isolated the plant site from other plants. Elevated platforms, walkways and ramps are installed and equipped with handrails, toe-plates, and non-slip surfaces. Proper safety related signboards and pictorial safety signs are given on site mentioning caution for area of fire, various types of hazards and general awareness prohibiting smoking inside the power plant. Signboards and pictorial safety signs are written in Bengali and English language.
73. There are two folding rotatable gates and control room at entrance of the plant site and another one is at back side of the plant area. The security of site is maintained properly by security person at South, North & West Side gate. chemical plant area, River side area, CW pump house area and Berge area. The location of three gates is shown in the map.



Figure 7: Present Boundary Wall Condition & Warning Signage at the Plant Site

4.2.3 Personal Protective Equipment

74. The working personnel involved in the construction activities has to be under the safeguard of personal protective equipment (PPE) properly. Everyone was instructed to use proper PPE strictly. Figure 8 shows that, the employees involved in operation were using applicable PPEs. A list of PPEs that are supplied are listed in Table 22.

Table 22: List of Personal Protective Equipment Used in Plant Area

SI No.	Type of work	Personal Protective Equipment used in site
1.	Operation and Maintenance (During Hot work, Cold work, Confined space)	Safety Jacket, Safety Shoes, Safety Helmet, Welding Helmet, Grinding Helmet, Arc Flash Suit, Ear Muff/Ear Plug, Anti Gas Mask/Respiratory Protection and Hand Gloves.
2.	Welding (Hot	Welding Helmet, Safety shoes, Eye & Face protection,

	work)	Welding Apron, Protective Apron, Hand Gloves, Ear Muff/Ear Plug, Anti Gas Mask/Respiratory protection etc.
3.	Scaffolding (Works at height)	Safety Jacket, Full body Safety Harness with fall arrestor, Safety Shoes, Safety Helmet, Eye & Face protection, Safety belt, Hand protection.
4.	Excavation	Safety Jacket, Safety Shoes, Gumboot, Safety Helmet, Confined Space Tripod with Life Liner, Respiratory protection and Hand Gloves.
5.	COVID-19	Mask, Non-sterile gloves, Soap, Hand Sanitizer etc.



Figure 8: Use of Proper PPEs during Works

4.2.4 Incident Record & Reporting

75. APSCL authority has developed to monitor any incident, accident, near misses, first aid recording and reporting system with proper format. It is observed that the Incident Record & Reporting are being properly monitored and recorded in the register book. There was no accident in the reporting time. However, some first aid recording was found. If any incidental issue arises, immediately it has to be reported & recorded properly in the prescribed format as per form no. SF-OHS-24 which format can be seen in Annex V.

4.2.5 Waste & Hazardous Materials

76. Wastes were generated from maintenance and employee's daily activities at the project site. For waste management, dustbins of different color codes indicating different wastes are placed in different locations of the project site. All solid, liquid and non-hazardous, hazardous waste are disposed to the designated container at the plant site. The most common non-hazardous waste were paper, packaging material and air filter. Packaging material and air filter were mostly generated in every five months in average during air filter change in air intake of gas turbine. Paper and packaging materials were sold to the local market for recycle. Air Filters were sold to 3rd party as per applicable rule. Other hazardous material like oily rags are not

generated in significant amount till now. All kinds of solid wastes are disposed to APSCL's scrap yard for proper management. The saleable or recyclable solid wastes were handed over to proper party for recycling. Liquid hazardous waste was conserved in sealed and labelled container and was properly cleaned of the storage area. Hazardous waste was kept at designated places by labelling. But in fact, being a new plant till now significant amount of hazardous waste is not generated from this plant. Generated wastes are disposed at the designated dumping site (Figure 9) in front of Unit-5 of APSCL. Waste inventory was properly maintained and Table 23 describes the amount of waste generated according to their character during the reporting time. List and amount of waste generated each month can be seen in Annex IV. Some mitigation measures are needed that will be taken as required which is summarized in Table 27.

Table 23: Waste Inventory Log (From January to June 2023)

SI	Wastage Name	Wastage Classification	Wastage Type	Source of wastage	Wastage storage area	Storage quantity (No/ Kg/ Vol)
1	Paper/ Cartons	Non-Hazardous	Solid	Plant Site	On site	12.5 kgs
2	Timber/ Wood Scraps	Non-Hazardous	Solid	Plant Site	On site	5.5 kgs
3	Steel/ Metal Scraps	Non-Hazardous	Solid	Plant Site	On site	10.5 kgs
4	Glass	Non-Hazardous	Solid	Plant Site	On site	6 kgs
5	Plastic	Non-Hazardous	Solid	Plant Site	On site	5 kgs
6	Welding Electrodes & Grinding Disc	Non-Hazardous	Solid	Plant Site	On site	19 pcs
7	Insulation Materials	Non-Hazardous	Solid	Plant Site	On site	11.5 kgs
8	Electrical Cables/ Wires Fuses & Contactors	Non-Hazardous	Solid	Plant Site	On site	12 kgs
9	Packing Materials	Non-Hazardous	Solid	Plant Site	On site	15.5 kgs
10	Air Filters	Non-Hazardous	Solid	Plant Site	On site	570 Pcs
11	Spent/ Used Oils & Grease	Hazardous	Liquid	Plant Site	On site	5 Lit
12	Oily rags, oil sorbents excluding Lube oil flushes	Hazardous	Solid/Liquid	Plant Site	On site	9.5 kgs
13	Fluorescent Light Tubes & Light Bulbs	Hazardous	Solid	Plant Site	On site	11 pcs

4.2.5.1 Solid Waste Management Plan

77. **Step-01: Collection System:** All solid wastes including operational maintenance wastes, waste generated by employees and workers activities and other waste will be accumulated on site after collecting from the source of generation.

78. **Step-02: Segregation:** There are various types of solid wastes; these will be segregated in the project site according to their natures as described below using designated waste bins.

79. **Operational Maintenance waste:** Electrical wiring, rebar, wood, plaster, and scrap metal, cement, and bricks.
80. **Organic waste:** Kitchen waste, vegetables, flowers, leaves, fruits.
81. **Toxic waste:** Old medicines, paints, chemicals, bulbs, spray cans, fertilizer and pesticide containers, batteries, shoe polish.
82. **Recyclable waste:** Paper, glass, metals, plastics.
83. **Step-03: Transportation:** After segregation of solid waste from the project site, proper solid waste log is maintained and transported to disposal point by trucks.
84. **Step- 04: Disposal System:** From the transported solid waste, the recyclable inorganic solid waste will be recycled and biodegradable organic solid waste will be disposed in the disposal location. From this location, the Municipal Authority collect this waste to dump their location. Remaining non-biodegradable waste will be sold to secondary vendors.



Figure 9: Waste Disposal Site at APSCCL

4.2.6 Employee's Health and COVID Response

85. APSCCL has own medical centre with full time doctors and nurses. So, employees get treatment here. Beside this annual health check-up program is a common practice here. There are two ambulances for emergency service in the plant area to support any emergency medical aid and shifting to the hospital/medical centre. First aid facilities are available at plant site. Required Furnished First-Aid Box is provided from plant medical centre.
86. First Aid Box is furnished with medicine list that are-
- Adhesive Tape
 - Face Mask
 - Hand Gloves
 - Hand Sanitizer

- Adhesive Bandages (Band-Aids) in several sizes
- Elastic Bandage
- Splint
- Antiseptic Wipes
- Antibiotic Ointment
- Antiseptic Solution (Like Hydrogen Peroxide/Viodin)
- Savlon Cream
- Tweezers
- Sharp Scissors
- Nebanol Powder
- Alcohol Wipes Or Ethyl Alcohol
- Thermometer
- OR Saline

87. APSCL and this plant follows COVID-19 guidelines of Directorate of Health, Bangladesh. Beside this APSCL has it's own COVID-19 response guidelines that is followed. Generally, it is always ensured that all of the employees are vaccinated.



Figure 10: On-site Ambulance and furnished First Aid box.

4.2.7 Grievance Redress Mechanism

88. Grievance Redress Mechanism (GRM) allows project affected persons not to lose time and resources from going through lengthy administrative and legal procedures. During the operational phase of the project, the complaints that may be anticipated are mostly related to noise & vibration of the engines. However, unforeseen issues may occur. To settle such issues effectively, an effective and transparent channel for lodging complaints and grievances is established. For ensuring proper implementation of GRM, APSCL has set-up a grievance redress committee (GRC) shown in table 24 that will address any complaints during operational period of this project. But yet no grievance is recorded.

89. The representation in the committee makes project affected persons to have trust and build confidence in the system. The grievance redress committee reports its plan and activities to the Implementation committee. The following list presents members of the committee a figure 11 represents the step wise procedure of GRM.

90. GRC will maintain a Complaints Database, which will contain all the information on complaints or grievances received from the communities or other stakeholders. This would include: the type of complaint, location, time, actions to address these complaints, and final outcome. APSCL external complain log is shown in Annex VI.
91. The procedures to be followed and adopted by the grievance redress should be transparent and simple to understand or uniform process for registering complaints provide project affected persons with free access to the procedures. The response time between activating the procedure and reaching a resolution should be as short as possible. An effective monitoring system will inform project management about the frequency and nature of grievances. GRC will arrange half yearly meetings where the activities and the outcomes/measures taken according to the Complaints Database are to be monitored and reviewed to ensure the required transparency. In addition to the above, if there are any grievances related to environmental management issues in the project area, the GRC will record these grievances and suggestions and pass it on to the relevant personnel for necessary action and follow-up.
92. GRC will be responsible to response for the grievances within a time limit. The initial movement to identify the causes should be taken within 48 hours. The GRC will not take more than two weeks to take the final initiative.
93. In case a dispute is not resolved by arbitral tribunal, then if any of the Party disagrees, the aggrieved party has the right to appeal to the ordinary courts of law. However, the preferred option of dispute settlement ought to be the option of settling the dispute amicably because recourse to courts may take a very long-time even years before a final decision is made and therefore, should not be the preferred option for both parties.
94. Beside this as per Labor Law 2018 and Clause no 81 of Labor Rules 2015, APSCL has an active 'Safety Committee' to address and solve the internal grievance regarding Health, Safety and Environmental issues. APSCL has established and published 'Citizen's Charter' System to address any grievance related to it and to rectify the problem rapidly by proper system. The web link of this is: https://apscl.portal.gov.bd/site/view/citizen_charter/.
95. APSCL has also online Grievance Redress System. The useful links of these are: <http://apscl.gov.bd/site/page/929f626c-752c-4724-9680-845d0414883f/Process-Map> & <http://www.grs.gov.bd/>.
96. If anybody is affected by this 400 MW CCPP (East) project activities of APSCL can give complain here. However, no grievance was recorded regarding this project.

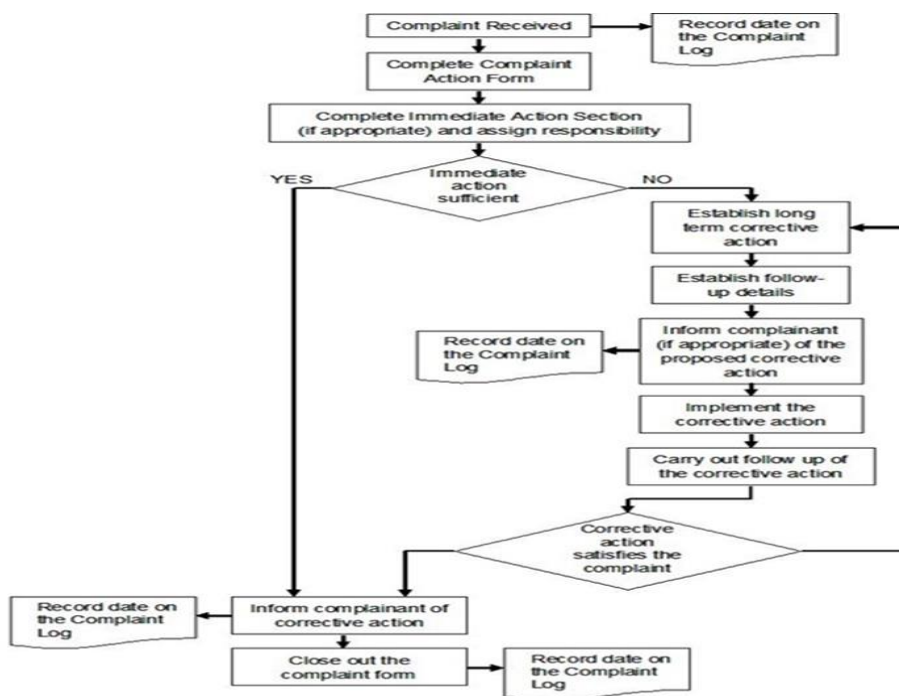


Figure 11: Flowchart of Complain/Grievance Procedure

Table 24: Members of the Committee of Grievance Redress (GRC)

SI No	Designation
1.	Project Director (Chief Engineer), Ashuganj 400 MW East Project
2.	Chief Engineer (O&M), APSCL.
3.	Manager (HRM), APSCL.
4.	Manager (HS&E), APSCL.
5.	Deputy Manager (Security & Discipline), APSCL.
6.	Assistant Manager (Security & Discipline), APSCL.
7.	Chairman, Ashuganj Union Parishad, Member.

4.2.8 Safety orientation & training of employees

97. Training is essential to maintain the employee health and safety. Both theoretical and practical trainings are conducted regularly for the employees based on the plant operational and maintenance activities, regarding HS&E issues and medical emergencies by Power Plant Training Centre (PPTC) of APSCL. For proper implementation of EMP and other compliance obligation, APSCL emphases on capacity building of its employees and arranges several training programs over the year. Newly appointed employees were trained on Operational and Maintenance works and on HS&E issues by HS&E Manager and other relevant internal experts in its own Training Center and this are a continuous process for all newly appointed and existing employees. All kinds of health and environmental related issues like basic

hygiene, waste management etc. are discussed in occupational health and safety training. The training participant number is ensured by Human Resource Department (HRD) through an official order. However, sometimes participants are not be able to participate in training due to emergency operational and maintenance work and for their convenience they are noticed to participate in the next scheduled date on the same topic. Due to the present pandemic situation and for ensuring employees' health protection, no training and drill was arranged till December 2021. But from January 2022, planned trainings are being arranged in both physically and online platform by Human Resource Department (HRD). As APSCL's training center provide training to all employees as per Training Calendar. Training on waste management system is covered under the broad title on "Training on OHS, HIRA, EAI, IMS, 5S and Overall Project Environment Study" for power plant to respective operation and maintenance employees of all units of APSCL. It is a continuous process. Furthermore, during daily toolbox talk of operation and maintenance divisions, this issue is briefed to employees by respective divisional officers. Total 19 trainings are provided up to June 2023. Training and capacity building activities provided to employees of 400 MW CCPP (East) are shown in Table 25. There is a safety committee as per Labor Law and also an internal Joint Health and Safety Committee formed by officers and staffs to identify and mitigate OHS issues in the plant. Hazard identification & risk assessment and Environmental impact and aspect analysis is done using qualitative tool for every job at all levels to prevent any kind of incident/accident. APSCL's management system is IMS (ISO 9001: 2015, ISO 14001: 2015 & ISO 45001: 2018) certified. So, all the plant operational and maintenance activities are done properly maintaining all requirements of IMS standards and applicable legal requirements to ensure all proper health, safety and environmental issues in this plant. There is environmental meeting performed in every month and discuss the overall performance of the HS&E issues of this power plant.

Table 25: Training and Capacity Building Activities Performed for Employees of 400 MW CCPP (EAST)

Sl	Training Title	Training Date	Venue	Training Details	No. of Participants	
					Male	Female
1.	Steps taking on 4 th Industrial Revolution Challenges	07-01-2023	APSCL Conference Room	4 th Industrial Revolution Challenges	27	2
2.	Occupational Health, Safety & Environment, First Aid & Fire Fighting (Batch-4)	08-01-2023 to 09-01-2023	APSCL Training Center	1. Occupational Health, Safety & Environment, 2. HIRA, & EIA, 3. IMS & 5S, 4. Overall Project Environmental Study, 5. Ensure Safety of Man & Equipment During Operation, Maintenance and Overhauling, 6. First Aid of Fire Incident 7. Fire, Classes of Fire & Risks, 8. Operation Procedures of Various Fire Fighting Equipment.	10	-
3.	Operation and Electrical Maintenance works of Boiler Feed Pump (BFP), Circulating Water Pump (CWP), Condensate Extraction Pump (CEP), Closed Cooling Water Pump (CCWP), Auxiliary Cooling Water Pump (ACWP) & Instrument Air Compressor (Batch-1)	24-01-2023 to 25-01-2023	APSCL Training Center	Operation and Electrical Maintenance works of 1.Boiler Feed Pump (BFP), 2. Circulating Water Pump (CWP), 3. Condensate Extraction Pump (CEP), 4. Closed Cooling Water Pump (CCWP), 5. Auxiliary Cooling Water Pump (ACWP) & 6. Instrument Air Compressor	3	-
4.	Power Plant Operation (Part-2: ST & BoP) (Batch-2)	29-01-2023 to 30-01-2023	APSCL Training Center	Power Plant Operation (Part-2: ST & BoP)	5	-

5.	Operator MMI & SMI Training	30-01-2023 to 10-02-2023	SIEMENS	Operator MMI & SMI Training	2	-
6.	Introduction to Industry (Batch-83)	05-02-2023 to 02-03-2023	Department of Labour, Chittagong	Introduction to Industry	1	-
7.	Workshop on Energy Storage	05-02-2023 to 07-02-2023	Power Division	Energy Storage	3	-
8.	Grid Modernization (Smart Grid) and Transmission Planning for Cross-Border Electricity Trade	07-02-2023 to 08-02-2023	USAID BADGE, Gulshan-2	Grid Modernization (Smart Grid) and Transmission Planning for Cross-Border Electricity Trade	2	1
9.	Operator MMI & SMI Training	13-02-2023 to 24-02-2023	SIEMENS	Operator MMI & SMI Training	5	-
10.	E-Filing (Batch-3)	15-02-2023	APSCL Training Center	On the Job E-Filing	8	-
11.	Increasing Efficiency of S&D Division for KPI Security	16-02-2023, 20-02-2023 & 22-02-2023	APSCL Training Center	KPI Security	15	-
12.	Gender & Development for female employees of APSCL	25-02-2023	APSCL Training Center	Gender & Development for female employees	-	48
13.	Operator MMI & SMI Training	27-02-2023 to 10-03-2023	SIEMENS	Operator MMI & SMI Training	6	-
14.	Mechanical Maintenance Training	13-03-2023 to 24-03-2023	SIEMENS	Mechanical Maintenance Training	3	-
15.	Instrumentation & Control System in Power Station (Batch-2)	19-03-2023 to 09-04-2023	BPMI	Instrumentation & Control System in Power Station	1	-
16.	Steps taking on 4 th Industrial Revolution Challenges	15-04-2023	Online (Zoom)	Steps taking on 4 th Industrial Revolution Challenges	30	2
17.	Operator EM & SMI Training	08-05-2023 to 22-05-2023	SIEMENS	Operator EM & SMI Training	3	-
18.	Future Training Needs for Power Sector Organizations (PSOs)	14-05-2023	BPMI	Future Training Needs for Power Sector Organizations (PSOs)	2	-
19.	Integrated Management System (IMS) (Batch-1)	17-05-2023 to 25-05-2023	BPMI	Integrated Management System (IMS) [ISO 9001:2015, ISO 14001:2015 & ISO 45001:2018]	1	-

4.2.9 Sanitation & Drinking Water Facility

98. Treated river water is being supplied through the arrangement of piping network in the plant site and this water is available to the employees for the washing and toilet facilities purpose. Pure drinking water is provided to all employees of the plant by robust purification system with reverse osmosis and UV with ambient and cold-water system at various locations in adequate numbers. Adequate toilets for male and female employees are constructed and cleaned every day as required.



Figure 12: Pure Drinking Water & Sanitation facility

4.2.10 Site Drainage

99. Proper outer/inter drainage system has developed in the project site. The construction work of necessary outer/inner drainage (Figure 13) has also been completed.



Figure 13: Photograph of Site Drainage

4.2.11 Oily Waste Generation & Disposal System

100. Oily waste generation & disposal system is required significantly during operational phase. In this power plant, there is an automated oil water separator where the drained oil water will be separated after achieving the certain level. It can also be operated manually. Then the separated oil will be collected from the reserve tank to be reused or sell as per rule. And the treated separated water can be reused for gardening.

4.2.12 HSE Summary

101. HSE summary with corrective action measures for operational phase are shown in table 26.

Table 26: HSE Summary with Corrective Action Measures

Areas to improve:		Housekeeping all area, Proper Safety, Housekeeping, Confined Space entry, toolbox, Use of PPE, Incident reporting	
SI	Description	From January-June 2023	Remarks/Corrective Action
1	Total Man-hour	254800	
2	Safe man hours	254800	
3	Fatal Accidents	0	
4	Lost Time Injury (LTI)	0	
5	Medical Treatment (MT)	0	
6	First Aid Cases (FAC)	5	Root cause analysis was done.
7	Health Incidents	0	
8	Property Damage (PD)	0	
9	Fire/Explosion	0	
10	Security Incident	0	
11	Near Miss	0	
12	Minor Injury	1	Root cause analysis was done.
13	Environment (EN)	0	
14	Job Transfer days	0	
15	Total Days Lost	0	
16	Tool Box Talks	12	Continued.
17	Grievance	0	
18	Safety Observations (SOC)	10	Root Cause analysis were done with awareness buildup and toolbox talks. Works were conducted following as per operational manual or SOP.

102. Here is the Semi-Annual HSE statistics report for the January to June,2023.



Table 27: Implementation Status of EMP

Potential Impact	Description of Potential Impact	Mitigation Measures Taken	Status
Environmental Issues: Plant Noise	Unexpected increase in noise levels in the community	<ul style="list-style-type: none"> • Updated environment friendly technology with 58.75% plant efficiency at combined cycle mode and low noise equipment are installed. • Acoustic enclosure of turbine compartments consists of single layer of 2mm thick steel outer plate, 75 mm thick rock wool insulation and perforated steel inner plate. • Acoustic enclosure of exhaust diffusers consists of single layer of 4mm thick steel outer plate, 150 mm thick rock wool insulation and 4mm thick steel inner plate. • Silencing on the inlet system via an 8-foot-long parallel acoustic baffle. • Silencers are used on vents and ventilators. • Proper stack height is maintained with silencers fitted. • Proper acoustic design for the power house building, control building and all other structures in the plant area. • To prevent noise generating from vibration was considered during plant design. So, very well-balanced vibration preventing structure is constructed for turbine to be operated at high rotational speed. • Use of all kinds of respective personal protective equipment (ear muff and ear plug for noise) are mandatory for all in the plant site. • Noise levels are monitored regularly within the communities where nearest potentially affected noise sensitive receptors are identified in order to take timely corrective measures, if needed. • Traffic noise is controlled by proper traffic management. Speed limit is restricted as 10 Km/Hr in plant site. 	100%

Plant Effluents	The power plant is expected to generate liquid effluents in the form of oily water, plant cooling water, washing water, blow down water, treatment system effluent and sanitary wastewater	<ul style="list-style-type: none"> • The power plant water treatment system is designed to ensure that the wastewater meets Bangladesh National Environment Quality Standards (BNEQS) before it is drained into the drainage channels or used for arboriculture. • The design of intake and cooling water structures are incorporated with measuring to reduce impacts. In addition, good site management practices include the following are implemented and monitored: • This plant is designed considering as zero HRSB blow down and make-up water. Proper treatment of contaminated water or cooling water before discharge through discharge channel to natural water body. • Oil water separator is used for segregation and pretreatment of oil and grease containing effluents prior to discharge to prevent water pollution. • No disposal of solid wastes into discharge structure. • Regular maintenance of site drainage system to ensure efficient operation and to prevent siltation. • Thermal pollution is controlled by flowing discharged water through a channel of 2 KM long provided with structure to create turbulence for reducing the temperature a different point the discharged water before mixing with the river water. • Sanitary and domestic wastewater are disposed to septic tank. No sanitary wastewater is discharged to discharge channel or drainage system. • All discharge is complied with the local and World Bank guidelines. • Regular monitoring of wastewater treatment plant and oil water separator to prevent pollution. 	100%
Emission	Emission from the plant can potentially affect air quality	<ul style="list-style-type: none"> • APSCL has implemented the mitigation measures suggested in the EMP report. • Dry Low NOx burner (DLN) is used for this turbine. • Combustion temperature is much less 670°C for this turbine. • Proper stack height is maintained (65m height with 7.64m inside dia for main and 	100%

		<p>50m height with 6.8m inside dia for bypass stack).</p> <ul style="list-style-type: none"> • Continuous emission monitoring station (CEMS) are installed to monitor NOx, CO₂, CO, O₂ in stack emission continuously. • Sufficient plantation and gardening are done for carbon sink, temperature reduction and for beautification. • This plant is constructed by replacing old inefficient plants of Unit-3 that was generating in total of 150 MW and emitted 17,78,010 ton of CO₂ per year. But 400 MW CCPP (East) plant emits only 10,23,860 ton of CO₂ per year at full load. So, compared to those old inefficient power plant units, this new 400 MW CCPP (East) plant is reducing 7,54,150 ton of CO₂ per year. That is a significant reduction of GHG emission. • The GHG emission of this plant is variable with the monthly generation and gas consumption. 	
Water Resources	An adverse impact on the water resources will be interpreted if it is established that the water consumed by the Project has directly affected the ability of the community to meet their water needs.	<ul style="list-style-type: none"> • Surface water (river water) is used for both drinking purpose and external use after proper treatment. Supply of pure mineral drinking water is ensured for all in the plant area by sufficient number of high-quality Drinking water purifier & Dispenser at suitable locations that are visible to all. • Water quality is regularly tested and monitored to ensure performance of water treatment plant and Drinking water purifier & Dispenser for the safety of human. • Employees, visitors, contractors, vendors and other peoples who come in this plant are aware of least water consumption and water conservation. Awareness program is an ongoing process for this issue. 	100%
Hazardous and Non-hazardous Waste	Various types of waste such as packing waste, metal scrap and excess materials, air filters, oily rags will be generated during the operation phase.	<ul style="list-style-type: none"> • Good practice measures are continued into the operation phase • Storage and handling of hazardous materials in accordance with international standards and appropriate to their hazard characteristic. • All hazardous waste is separated from other wastes. Designated dustbins are used 	100%

	The waste can be a health hazard and pollute water ways, if disposed improperly.	<ul style="list-style-type: none"> for segregation of waste and for proper management. Storage of fuels, chemicals and lubricants in bounded areas with impervious flooding and secondary containment of 110% capacity. Availability of supporting information such as the MSDS and proper warning signage are available in all respective places. Waste record and manifest are done according to standard prescribed format and disposal of waste is done in environment friendly way. Employees are trained up on source reduction, as well as reuse and recycling. 	
Waste Management	Waste generated during power plant operation can potentially damage the environment.	<ul style="list-style-type: none"> Separation of the recyclable materials. Designated dustbins are used for segregation of waste and for proper management. Regular audits of waste management systems Maintenance of Waste Tracking Register by following standard prescribed format of APSCL. Separation of hazardous waste from non-hazardous waste. On-site segregation and initial storage of hazardous waste. Off-site disposal of hazardous waste in approved hazardous waste disposal facility. Recyclable waste is disposed via waste contractors in safe way. Audits of the waste disposal contractors and waste disposal facilities. An emergency response plan for the hazardous substances is developed and maintained. Training of personnel in identification, segregation and management of waste. Appropriate leveling of all containers of hazardous waste. Training is given to all employees regularly on proper waste management practice. Ensuring compliance with applicable local and international regulations. 	100%
Occupational Health and	Injury, accident or any kind of incident may occur during plant operational	<ul style="list-style-type: none"> Job safety analysis are done and all kinds of operational and maintenance works go as appropriate manner. 	100%

<p>Safety</p>	<p>period.</p>	<ul style="list-style-type: none"> • Hazard identification and risk assessment with environmental aspect and impact are done by active participation of employees and workers. Training are continuously given to employees and workers including aspect of hazard identification, safe operating, tool and material handling procedures, safe work practices, ergonomics, first aid, basic emergency procedures like fire, earth quake, chemical spillage, gas spillage, electric shock etc. • Daily toolbox meeting is a mandatory practice here and works are performed according to standard operating procedures (SOP). 	
		<ul style="list-style-type: none"> • Work permit for hot work, cold work, works in height and confined space are strictly maintained. • Lock out and Tag out (LOTO) is strictly maintained for clearance and accident free operation. • Use of suitable and respective personal protective equipments are mandatory for all in plant site. • General inspection in standard prescribed format including all office locations and activities, lighting check are done regularly. • Monitoring and record keeping activities including audit plan, procedures to verify and record the effectiveness of prevention and control of exposure to occupational hazards and maintaining accident and incident investigation reports. • Safe drinking water is provided to all. • Regular health checkup is done for all employees and workers in APSCL medical center. Information is shared with them about different types of vector borne diseases. 	<p>100%</p>

Employment Conflicts	Conflicts may arise if the nearby communities feel that they are not given substantial share in plant related job opportunities.	<ul style="list-style-type: none"> • Maximum numbers of unskilled and semiskilled jobs are provided to the local communities. • A local labor selection criterion is developed and maintained in operational period with the community. 	100%
COVID 19 Management	Faster spreading of corona virus into the APSCL community due to lack of precautionary measure that may lead to severe respiratory illness.	<ul style="list-style-type: none"> • During this critical period, APSCL immediately formed a committee to take precautionary action against COVID 19 pandemic • Taken immediate action on to prevent spread of Covid-19 from new project activities like under construction 400 MW CCPP (East) Project by controlling of movement of foreigners, local workers and other construction & maintenance activities of APSCL. • Supply safety leaflet to office staff about mandatory requirements for wearing face masks, hand washing and other protective measures. • Provide adequate hand washing facility at different location of plants. • Restriction of people’s movement in Plant & Residential areas. • Prohibition of outsider’s entry in residential areas. • Regular announcement in residential colonies about updated decision/information of COVID-19 Committee of APSCL. • Place the disinfectant items in prominent locations, including antiseptic liquid, hand sanitizer, disinfectant water spray for surface disinfection, disinfectant air spray for vehicles, etc. • Distribute 2-layered fabric masks to all employees, all security personnel & enforcement to ensure use of it. • LASER Temperature measurement thermometers to measure temperature of employees at each entry gate/point. • Disinfect the workplace, canteen and other public area: 3 times a day & as required (at 8am and 5pm). • Disinfect the facilities, operational vehicles: 3 times a day & as required (at 8am to 5pm). 	100%

		<ul style="list-style-type: none"> • Vehicles need to be disinfected when entering or leaving. • Daily body temperature check for all employees and outside parties, Local & foreign project workers on site: Every entry time a day (at 8am and 10pm). • Maintaining “not to attend in office & no going to outside policy” if anybody feels fever/cough/any symptom of COVID-19 situation or other seasonal viral fever & immediate medical attention for it. • Two Ambulances with 24 hours service. An ambulance is fully dedicated for COVID-19 related services keeping a driver in spare. 	
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5.0 HEALTH SAFETY AND ENVIRONMENTAL PERFORMANCE

103. APSCL is always aware to implement EMP for the gradual improvement of its Health Safety and environmental performance complying with the local and other compliance obligations. For illustrating the HSE performance concentration of PM_{2.5}, Maximum Noise intensity (Day time) and percentage of first cases with respect to the total man-hour worked are considered. Note that the concentration of dust varies with the season therefore only the same time period is considered to evaluate this.

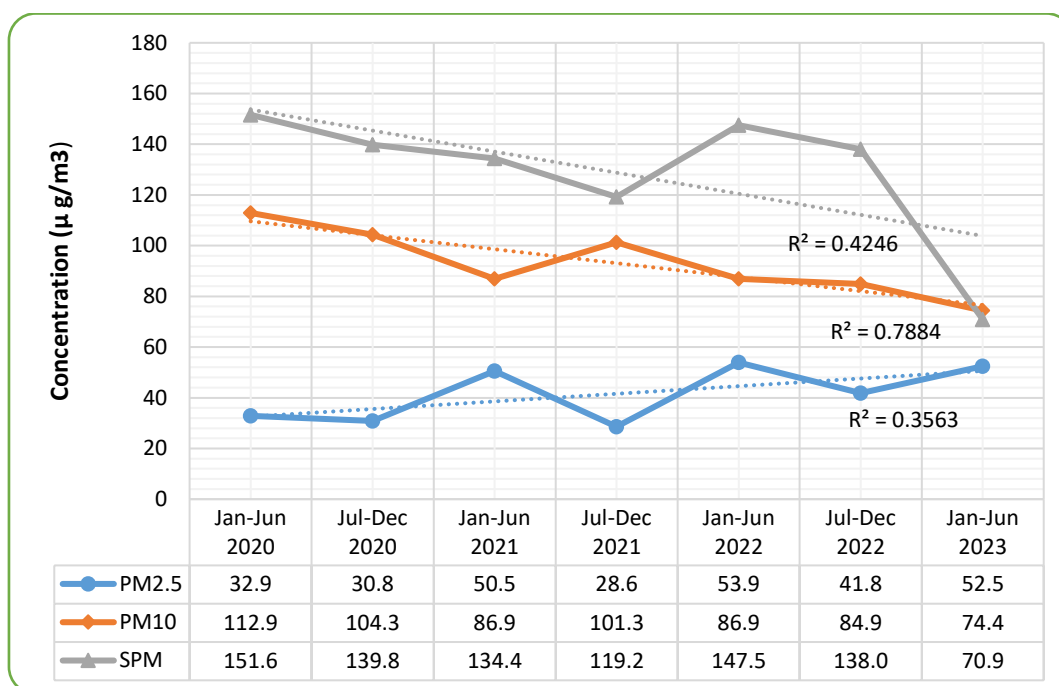


Figure 14: Trend of Particulate Matter (PM) Concentration

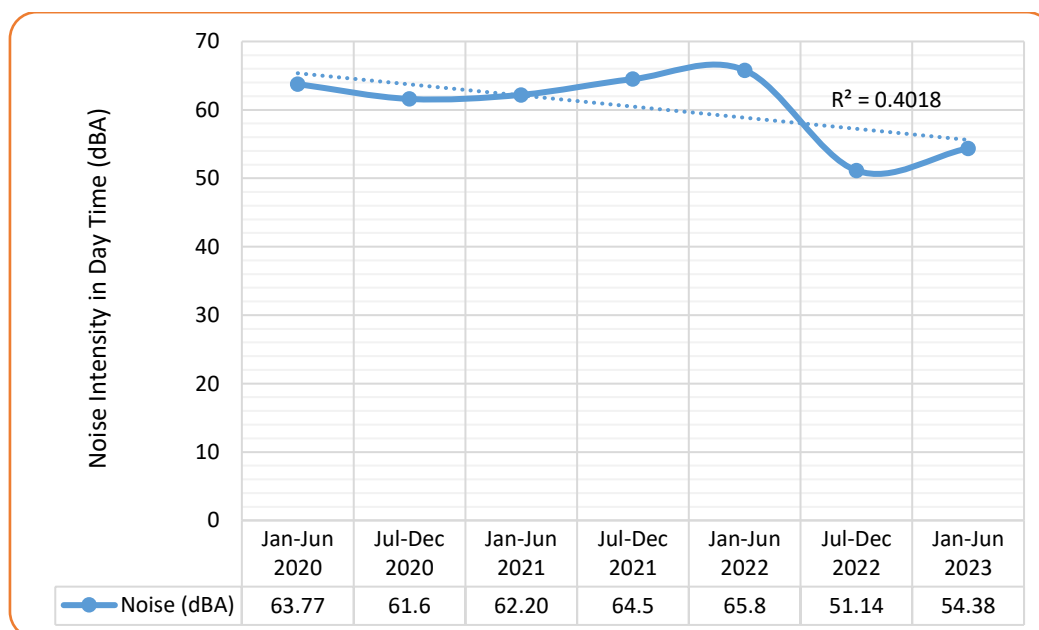


Figure 15: Trend in Noise intensity

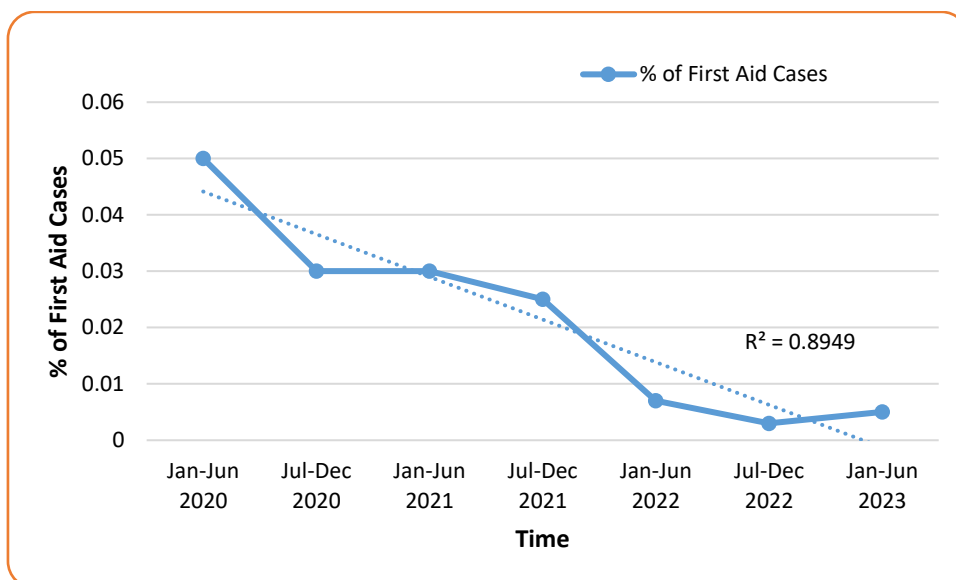


Figure 16: Trend in Percentages of First Aid Cases

104. Linear regression was done to determine the relation among the variables. The figures show that there is a decreasing trend in PM10, SPM concentration (not significant), noise intensity that was more intense in the reporting time and whereas, significant decreasing trend exist in percentage of first aid cases. On the other hand, heterogeneity in the concentration of PM2.5 was found in each semiannual time period. Note that the location considered for this comparison is in the plant premise and the road is always busy with slow and fast moving vehicle all the time. However, construction of new admin building and access road is going on. May be the concentration of PM 2.5 is influenced by these activities and the weather condition. Noise intensity may be intensified by the running auxiliaries associated with the plant for commissioning.

6.0 CONCLUSION AND RECOMMENDATION

105. The environmental monitoring report consists of 15th Semiannually environmental monitoring reporting based on monthly measured ambient air, noise, drinking water, ground and river water quality parameters. The work has been performed for the period of January to June 2023. Ambient air quality parameters were determined in the site with the help of high-volume sampler and noise quality was done by noise level meter. Drinking water, ground and surface water quality parameters were analyzed in the laboratory. All of the mitigation measures are taken following ADB Environmental Safeguard Policy 2009, IFC/World Bank Thermal Power plant guideline 2008 and 2017 and DoE, Bangladesh guideline.

106. From the analysis, it is found that the ambient air quality results found within DoE standards. This value are cumulative with surrounding ambient air and noise level. SO_x and CO are not a problem of the operational period of the power plant. But SPM, PM_{2.5}, PM₁₀ level during the operational period of the power plant is controlled by taking proper mitigation measures and spraying of water.

107. Noise level quality of Ashuganj 400 MW CCPP East has also been measured on monthly basis. According to the measurement, the noise level around the plant area found within the allowable limit of Industrial zone both day and also at night time. The noise level is controlled by using modern, new and fine-tuned equipment.
108. Surface water quality parameter at Meghna River was performed to evaluate whether this plant poses any detrimental effect on the water environment. From the analysis, it has been found that the project does not contaminate water pollution to the natural environment. Otherwise, any spill is not detected next to riverbeds around the worksite (oils, concrete waste or conglomerate asphalt, any colour changes of the water, etc.). Drinking and groundwater quality is also found good.
109. House-keeping is also in good condition at the plant site. All solid, liquid and hazardous waste are disposed of the designated container at the plant site. Most of the solid wastes are disposed of by landfill. The usable solid wastes are handed over to proper party for recycling.
110. HS&E Division of APSCL has already completed plantation works during this period at all applicable sites of this project and nursing works of these is continuing.
111. Finally, it can be concluded that the plant has a minor detrimental impact for short period on the environment in terms of ambient air during the operational period. The plant provides a good working environment for the employees and workers.

ANNEX-I: PHOTO INDEX



Central Control Building (CCB)



HRSG & Stacks



Water Treatment plant



Plant Road



Ambient Air Quality Monitoring



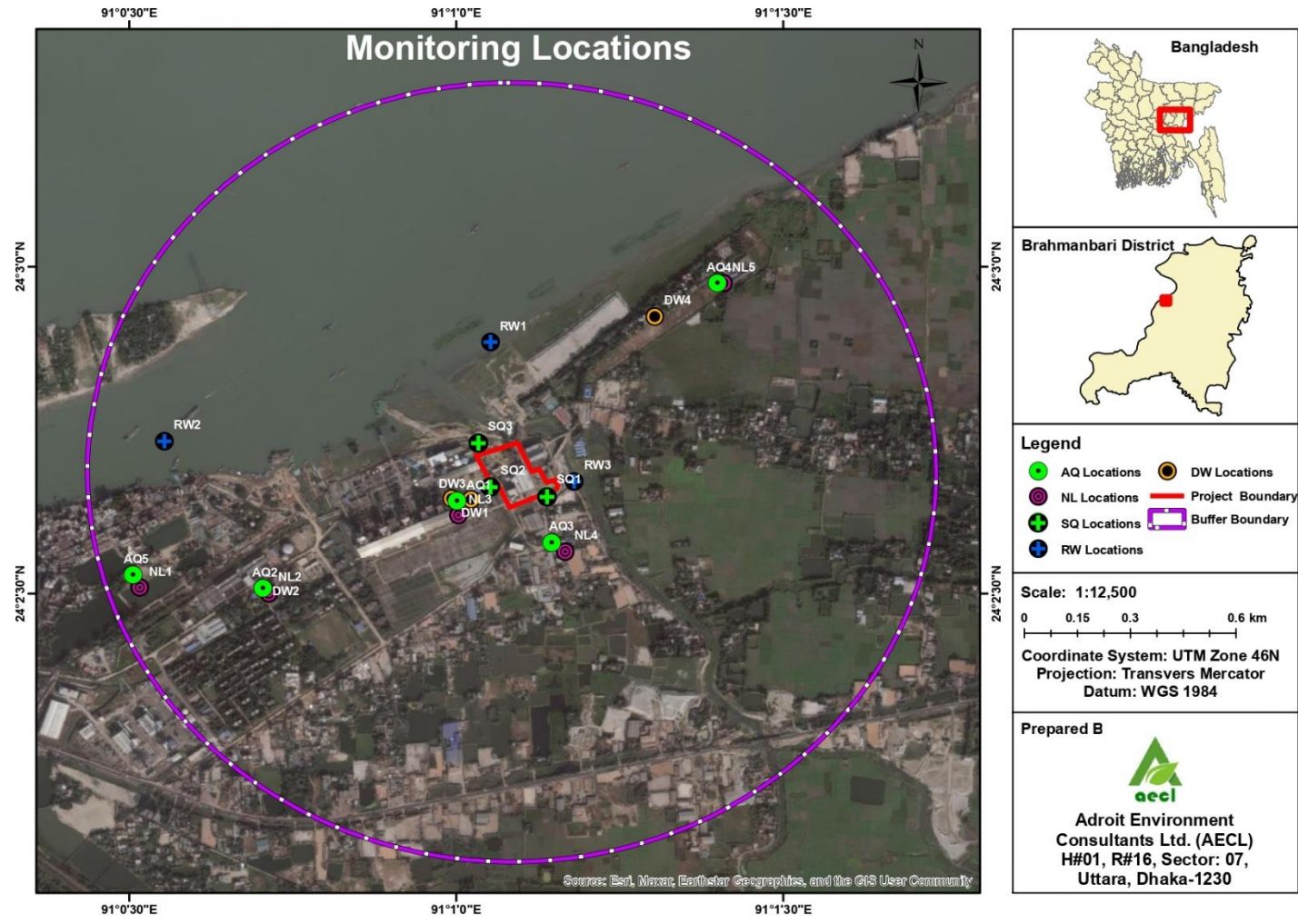
Noise Quality Monitoring

ANNEX-II: MONITORING LOCATIONS

Category	Indication of Location	GPS Co-ordinate		Specific Location	Distance (m)
		Latitude	Longitude		
Ambient air quality	Location-1 (L1)	24°02'38.5'' N	91°1'0.0'' E	South-West side of Project area near APSCL Admin building.	182
	Location-2 (L2)	24°02'30.5'' N	91°0'42.2'' E	South-west side of Project area near PDB High School.	702
	Location-3 (L3)	24°02'34.7'' N	91°01'8.7'' E	South-East side of Project area at TSK.	756.3
	Location-4 (L4)	24°02'58.5'' N	91°01'23.9'' E	North-East side of Project area near APSCL dormitory.	750
	Location-5 (L5)	24°02'31.7'' N	91°0'30.3'' E	South-West side of Project area near Haji Abdul Jalil High School.	1045
Noise Level	Location-1	24°02'38.5'' N	91°1'0.0'' E	South-West side of Project area near APSCL Admin building.	183
	Location-2	24°02'30.5'' N	91°0'42.2'' E	South-west side of Project area near PDB High School.	712.5
	Location-3	24°02'34.7'' N	91°01'8.7'' E	South-East side of Project area at TSK.	756.3
	Location-4	24°02'58.5'' N	91°01'23.9'' E	North-East side of Project area near APSCL dormitory.	751.3
	Location-5	24°02'31.7'' N	91°0'30.3'' E	South-West side of Project area near Haji Abdul Jalil High School.	1048.2
River Water	Upstream	24°02'53.1'' N	91°01'3.1'' E	North-West side of Project area near the project location	385.87
	Downstream	24°02'44.0'' N	91°00'33.2'' E	North-West side of Project area and near Ashuganj Chor Sonarampur.	905.93
	Outfall	24°02'40.3'' N	91°01'10.8'' E	South-East side of Project area near APSCL power plant area.	138.71

Category	Indication of Location	GPS Co-ordinate		Specific Location	Distance (m)
		Latitude	Longitude		
Drinking Water	Location-1 (D1)	24° 2'39.43"N	91° 0'58.29"E	North-West side of the project area at canteen	60.3
	Location-2 (D2)	24° 2'35.47"N	91°01'6.38"E	South-west side of Project area at admin building (Purifier)	41.53
	Location-3 (D3)	24°02'38.86'' N	91°01'.10'' E	South-west side of Project area near PDB High School.	56.51
	Location-4 (D4)	24° 2'38.51"N	91°01'1.10"E	South-West side of Project area at Haji Abdul Jalil High School.	55.63
Ground Water	Location 1: G1	24°02'38.1''N	91°0'58.0''E	Inside the project area	60.3
	Location 2: G2	24° 2'30.5"N	91°00'42.2"E	South-west side of Project area near PDB High School	56.51
	Location 3: G3	24°02'34.1''N	91° 1' 9.3''E	South-East side of the project	56.51
	Location 4: G4	24°02' 47.2''N	91° 1'12.3''E	North-East side of the project area	55.63

ANNEX-III: MONITORING LOCATIONS MAP



ANNEX-IV: WASTE RECORD

	ASHUGANJ POWER STATION COMPANY LIMITED	Document No. SF-ENV-09
	FORM	Revision No.: 00
	TITLE: MONTHLY WASTE RECORD	Effective Date: 14 Mar. 15
		Page 1 of 1

LOCATION: ASHUGANJ 400 MW CCPP (EAST)

MONTH: JANUARY

YEAR: 2023

Type of Waste	Material	Quantity No/ Kg/ Vol.	Mode of Disposal	Disposal Point	Remarks	
N O N - H A Z A R D O U S W a s t e	Domestic Refuse		Sanitary	Sanitary Landfilling Site, B. Baria Municipality	Safely Handed over	
	Paper/ Cartons	0.5	"	"	"	
	Concrete Debris		"	"	"	
	Timber/ Wood Scraps	1	"	"	"	
	Steel/ Metal Scraps	1.5	"	"	"	
	Excavated Soil		"	"	"	
	Glass		"	"	"	
	Rubber/Tires		"	"	"	
	Plastic	1.5	"	"	"	
	Welding Electrodes & Grinding Disc	2 pcs	"	"	"	
	Sanitary/ Sewage Water		"	"	"	
	Insulation Materials (Mineral Wool, Polystyrene etc.)	2.5	"	"	"	
	Electrical Cables/ Wires Fuses & Contactors	3	"	"	"	
	Others: Packing Materials	2.5	"	"	"	
H A Z A R D O U S W a s t e	Clinical/ Medical Waste	Sharp (Needle, Glass ware, lancet, blade)	150gm	Sanitary	B. Baria Municipality	Safely Handed over
		Contaminated (Gauze, dressing material, blood, pus, cough)	200gm	Sanitary	B. Baria Municipality	Safely Handed over
		Plastic waste (Saline bottle, saline set, BT set, blister)	250gm	Sanitary	B. Baria Municipality	Safely Handed over
	Spent/ Used Oils & Grease		"	"	"	
	Used/ Spent/ Expired Solvents, Resins & Painting Materials		"	"	"	
	Spent Filters containing Hazardous Chemicals/ Oils		"	"	"	
	Oily rags, oil sorbents excluding Lube oil flushes	1	"	"	"	
	Fluorescent Light Tubes & Light Bulbs	2 pcs	"	"	"	
	Bottles with Refrigerant Gas		"	"	"	
	Radioactive source used for Welding Inspection		"	"	"	
	Spent Lead acid/ Alkaline Batteries		"	"	"	
	Passivating & Chemical Cleaning Fluid waste		"	"	"	
	Steam /Gas Turbine Cleaning Waste		"	"	"	
	Automobile Waste		"	"	"	
	Others:		"	"	"	
Supervision Dr. Md. Shahidul Hassan		Division In Charge XEN (Opn)				
Note: All completed copy to be sent to Manager (Health, Safety & Environment).						

	ASHUGANJ POWER STATION COMPANY LIMITED	Document No. SF-ENV-09
	FORM	Revision No.: 00
	TITLE: MONTHLY WASTE RECORD	Effective Date: 14 Mar. 15
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LOCATION: ASHUGANJ 400 MW CCPP (EAST)

MONTH: FEBRUARY

YEAR: 2023

Type of Waste	Material	Quantity No/ Kg/ Vol.	Mode of Disposal	Disposal Point	Remarks	
N O N - H A Z A R D O U S W a s t e	Domestic Refuse		Sanitary	Sanitary Landfilling Site, B. Baria Municipality	Safely Handed over	
	Paper/ Cartons	1	"	"	"	
	Concrete Debris		"	"	"	
	Timber/ Wood Scraps	0.5	"	"	"	
	Steel/ Metal Scraps		"	"	"	
	Excavated Soil		"	"	"	
	Glass	1	"	"	"	
	Rubber/Tires		"	"	"	
	Plastic		"	"	"	
	Welding Electrodes & Grinding Disc	1 pcs	"	"	"	
	Sanitary/ Sewage Water		"	"	"	
	Insulation Materials (Mineral Wool, Polystyrene etc.)	0.5	"	"	"	
	Electrical Cables/ Wires Fuses & Contactors	1	"	"	"	
	Others: Packing Materials	3	"	"	"	
H A Z A R D O U S W a s t e	Clinical/ Medical Waste	Sharp (Needle, Glass ware, lancet, blade)	200gm	Sanitary	B. Baria Municipality	Safely Handed over
		Contaminated (Gauze, dressing material, blood, pus, cough)	150gm	Sanitary	B. Baria Municipality	Safely Handed over
		Plastic waste (Saline bottle, saline set, BT set, blister)	150gm	Sanitary	B. Baria Municipality	Safely Handed over
		Spent/ Used Oils & Grease		"	"	"
		Used/ Spent/ Expired Solvents, Resins & Painting Materials		"	"	"
		Spent Filters containing Hazardous Chemicals/ Oils		"	"	"
		Oily rags, oil sorbents excluding Lube oil flushes	2.5	"	"	"
		Fluorescent Light Tubes & Light Bulbs		"	"	"
		Bottles with Refrigerant Gas		"	"	"
		Radioactive source used for Welding Inspection		"	"	"
		Spent Lead acid/ Alkaline Batteries		"	"	"
		Passivating & Chemical Cleaning Fluid waste		"	"	"
		Steam /Gas Turbine Cleaning Waste		"	"	"
		Automobile Waste		"	"	"
	Others:		"	"	"	
Supervision Dr. Md. Shahidul Hassan		Division In Charge XEN (Opn)				
Note: All completed copy to be sent to Manager (Health, Safety & Environment).						

	ASHUGANJ POWER STATION COMPANY LIMITED	Document No. SF-ENV-09
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LOCATION: ASHUGANJ 400 MW CCPP (EAST)

MONTH: MARCH

YEAR: 2023

Type of Waste	Material	Quantity No/ Kg/ Vol.	Mode of Disposal	Disposal Point	Remarks	
N O N - H A Z A R D O U S W a s t e	Domestic Refuse		Sanitary	Sanitary Landfilling Site, B. Baria Municipality	Safely Handed over	
	Paper/ Cartons	2.5	"	"	"	
	Concrete Debris		"	"	"	
	Timber/ Wood Scraps	3	"	"	"	
	Steel/ Metal Scraps	2.5	"	"	"	
	Excavated Soil		"	"	"	
	Glass	0.5	"	"	"	
	Rubber/Tires		"	"	"	
	Plastic	2	"	"	"	
	Welding Electrodes & Grinding Disc	4 pcs	"	"	"	
	Sanitary/ Sewage Water		"	"	"	
	Insulation Materials (Mineral Wool, Polystyrene etc.)	1	"	"	"	
	Electrical Cables/ Wires Fuses & Contactors	1.5	"	"	"	
	Others: Air Filter	570	"	"	"	
H A Z A R D O U S W a s t e	Clinical/ Medical Waste	Sharp (Needle, Glass ware, lancet, blade)	250gm	Sanitary	B. Baria Municipality	Safely Handed over
		Contaminated (Gauze, dressing material, blood, pus, cough)	300gm	Sanitary	B. Baria Municipality	Safely Handed over
		Plastic waste (Saline bottle, saline set, BT set, blister)	200gm	Sanitary	B. Baria Municipality	Safely Handed over
	Spent/ Used Oils & Grease		"	"	"	
	Used/ Spent/ Expired Solvents, Resins & Painting Materials		"	"	"	
	Spent Filters containing Hazardous Chemicals/ Oils		"	"	"	
	Oily rags, oil sorbents excluding Lube oil flushes	1.5	"	"	"	
	Fluorescent Light Tubes & Light Bulbs	2 pcs	"	"	"	
	Bottles with Refrigerant Gas		"	"	"	
	Radioactive source used for Welding Inspection		"	"	"	
	Spent Lead acid/ Alkaline Batteries		"	"	"	
	Passivating & Chemical Cleaning Fluid waste		"	"	"	
	Steam /Gas Turbine Cleaning Waste		"	"	"	
	Automobile Waste		"	"	"	
Others:		"	"	"		
Supervision Dr. Md. Shahidul Hassan		Division In Charge XEN (Opn)				
Note: All completed copy to be sent to Manager (Health, Safety & Environment).						

	ASHUGANJ POWER STATION COMPANY LIMITED	Document No. SF-ENV-09
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LOCATION: ASHUGANJ 400 MW CCPP (EAST)

MONTH: APRIL

YEAR: 2023

Type of Waste	Material	Quantity No/ Kg/ Vol.	Mode of Disposal	Disposal Point	Remarks	
N O N - H A Z A R D O U S W a s t e	Domestic Refuse		Sanitary	Sanitary Landfilling Site, B. Baria Municipality	Safely Handed over	
	Paper/ Cartons	2	"	"	"	
	Concrete Debris		"	"	"	
	Timber/ Wood Scraps		"	"	"	
	Steel/ Metal Scraps	2.5	"	"	"	
	Excavated Soil		"	"	"	
	Glass	1.5	"	"	"	
	Rubber/Tires		"	"	"	
	Plastic	1.5	"	"	"	
	Welding Electrodes & Grinding Disc	4 pcs	"	"	"	
	Sanitary/ Sewage Water		"	"	"	
	Insulation Materials (Mineral Wool, Polystyrene etc.)	4	"	"	"	
	Electrical Cables/ Wires Fuses & Contactors	1	"	"	"	
	Others: Packaging Materials	2	"	"	"	
H A Z A R D O U S W a s t e	Clinical/ Medical Waste	Sharp (Needle, Glass ware, lancet, blade)	150gm	Sanitary	B. Baria Municipality	Safely Handed over
		Contaminated (Gauze, dressing material, blood, pus, cough)	300gm	Sanitary	B. Baria Municipality	Safely Handed over
		Plastic waste (Saline bottle, saline set, BT set, blister)	200gm	Sanitary	B. Baria Municipality	Safely Handed over
	Spent/ Used Oils & Grease		"	"	"	
	Used/ Spent/ Expired Solvents, Resins & Painting Materials		"	"	"	
	Spent Filters containing Hazardous Chemicals/ Oils		"	"	"	
	Oily rags, oil sorbents excluding Lube oil flushes	1	"	"	"	
	Fluorescent Light Tubes & Light Bulbs	3 pcs	"	"	"	
	Bottles with Refrigerant Gas		"	"	"	
	Radioactive source used for Welding Inspection		"	"	"	
	Spent Lead acid/ Alkaline Batteries		"	"	"	
	Passivating & Chemical Cleaning Fluid waste		"	"	"	
	Steam /Gas Turbine Cleaning Waste		"	"	"	
	Automobile Waste		"	"	"	
Others:		"	"	"		
Supervision Dr. Md. Shahidul Hassan		Division In Charge XEN (Opn)				
Note: All completed copy to be sent to Manager (Health, Safety & Environment).						

	ASHUGANJ POWER STATION COMPANY LIMITED	Document No. SF-ENV-09
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LOCATION: ASHUGANJ 400 MW CCPP (EAST)

MONTH: MAY

YEAR: 2023

Type of Waste	Material	Quantity No/ Kg/ Vol.	Mode of Disposal	Disposal Point	Remarks	
N O N - H A Z A R D O U S W a s t e	Domestic Refuse		Sanitary	Sanitary Landfilling Site, B. Baria Municipality	Safely Handed over	
	Paper/ Cartons	3.5	"	"	"	
	Concrete Debris		"	"	"	
	Timber/ Wood Scraps		"	"	"	
	Steel/ Metal Scraps	3.5	"	"	"	
	Excavated Soil		"	"	"	
	Glass	2.5	"	"	"	
	Rubber/Tires		"	"	"	
	Plastic	1	"	"	"	
	Welding Electrodes & Grinding Disc	6 pcs	"	"	"	
	Sanitary/ Sewage Water		"	"	"	
	Insulation Materials (Mineral Wool, Polystyrene etc.)	3.5	"	"	"	
	Electrical Cables/ Wires Fuses & Contactors	2.5	"	"	"	
	Others: Packing Materials	7	"	"	"	
H A Z A R D O U S W a s t e	Clinical/ Medical Waste	Sharp (Needle, Glass ware, lancet, blade)	350gm	Sanitary	B. Baria Municipality	Safely Handed over
		Contaminated (Gauze, dressing material, blood, pus, cough)	250gm	Sanitary	B. Baria Municipality	Safely Handed over
		Plastic waste (Saline bottle, saline set, BT set, blister)	200gm	Sanitary	B. Baria Municipality	Safely Handed over
	Spent/ Used Oils & Grease	5	"	"	"	
	Used/ Spent/ Expired Solvents, Resins & Painting Materials		"	"	"	
	Spent Filters containing Hazardous Chemicals/ Oils		"	"	"	
	Oily rags, oil sorbents excluding Lube oil flushes	1	"	"	"	
	Fluorescent Light Tubes & Light Bulbs		"	"	"	
	Bottles with Refrigerant Gas		"	"	"	
	Radioactive source used for Welding Inspection		"	"	"	
	Spent Lead acid/ Alkaline Batteries		"	"	"	
	Passivating & Chemical Cleaning Fluid waste		"	"	"	
	Steam /Gas Turbine Cleaning Waste		"	"	"	
	Automobile Waste		"	"	"	
Others:		"	"	"		
Supervision Dr. Md. Shahidul Hassan		Division In Charge XEN (Opn)				
Note: All completed copy to be sent to Manager (Health, Safety & Environment).						

	ASHUGANJ POWER STATION COMPANY LIMITED	Document No. SF-ENV-09
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LOCATION: ASHUGANJ 400 MW CCPP (EAST)

MONTH: JUNE

YEAR: 2023

Type of Waste	Material	Quantity No/ Kg/ Vol.	Mode of Disposal	Disposal Point	Remarks	
N O N - H A Z A R D O U S W a s t e	Domestic Refuse		Sanitary	Sanitary Landfilling Site, B. Baria Municipality	Safely Handed over	
	Paper/ Cartons	3	"	"	"	
	Concrete Debris		"	"	"	
	Timber/ Wood Scraps		"	"	"	
	Steel/ Metal Scraps	1	"	"	"	
	Excavated Soil		"	"	"	
	Glass		"	"	"	
	Rubber/Tires		"	"	"	
	Plastic	1.5	"	"	"	
	Welding Electrodes & Grinding Disc	3 pcs	"	"	"	
	Sanitary/ Sewage Water		"	"	"	
	Insulation Materials (Mineral Wool, Polystyrene etc.)		"	"	"	
	Electrical Cables/ Wires Fuses & Contactors	1	"	"	"	
	Others: Packing Materials	3	"	"	"	
H A Z A R D O U S W a s t e	Clinical/ Medical Waste	Sharp (Needle, Glass ware, lancet, blade)	250gm	Sanitary	B. Baria Municipality	Safely Handed over
		Contaminated (Gauze, dressing material, blood, pus, cough)	100gm	Sanitary	B. Baria Municipality	Safely Handed over
		Plastic waste (Saline bottle, saline set, BT set, blister)	200gm	Sanitary	B. Baria Municipality	Safely Handed over
	Spent/ Used Oils & Grease		"	"	"	
	Used/ Spent/ Expired Solvents, Resins & Painting Materials		"	"	"	
	Spent Filters containing Hazardous Chemicals/ Oils		"	"	"	
	Oily rags, oil sorbents excluding Lube oil flushes	1.5	"	"	"	
	Fluorescent Light Tubes & Light Bulbs	1 pcs	"	"	"	
	Bottles with Refrigerant Gas		"	"	"	
	Radioactive source used for Welding Inspection		"	"	"	
	Spent Lead acid/ Alkaline Batteries		"	"	"	
	Passivating & Chemical Cleaning Fluid waste		"	"	"	
	Steam /Gas Turbine Cleaning Waste		"	"	"	
	Automobile Waste		"	"	"	
Others:		"	"	"		
Supervision Dr. Md. Shahidul Hassan		Division In Charge XEN (Opn)				
Note: All completed copy to be sent to Manager (Health, Safety & Environment).						

ANNEX-V: SUMMARY OF ACCIDENT/INCIDENT/FIRST AID

	ASHUGANJ POWER STATION COMPANY LIMITED	Document No. SF-OHS-24
	FORM	Revision No.: 00
	TITLE: ANNUAL SUMMARY OF ACCIDENT/INCIDENT/FIRST AID	Effective Date: 14 Mar. 15
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Name of Division: 400 M.W. CCPP (East), Electrical, APSCCL
 Duration From: January 2023 to June 2023

Sl. No	Type of Incident Occurred	Jan.	Feb.	Mar.	Apr.	May	Jun.	Target for Year
1	Fatality	0	0	0	0	0	0	0
2	Accident (Lost Time Injury/LTI)	0	0	0	0	0	0	0
3	Accident (No Lost Time Injury)	0	0	0	0	0	0	0
4	Minor Injury	0	0	0	0	0	0	0
5	Near miss	0	0	0	0	0	0	0
6	First Aid Provided for Injury	0	1	0	0	0	0	0
Total Number in The Year		1. Fatality: 0 4. Minor Injury: 0		2. Accident (LTI): 0 5. Near Miss: 0		3. Accident (No LTI): 0 6. First Aid Provided: 1		0

Prepared By:
 Assistant Engineer (Electrical), CCPP (East)

Approved By:
 Executive Engineer (Electrical), CCPP (East)

Note: Send this Summary report to Management Representative (MR) & Manager (HS&E)/HS&E Division every following year within 5-15 January.

	ASHUGANJ POWER STATION COMPANY LIMITED	Document No. SF-OHS-24
	FORM	Revision No.: 00
	TITLE: ANNUAL SUMMARY OF ACCIDENT/INCIDENT/FIRST AID	Effective Date: 14 Mar. 15
		Page 1 of 1


Name of Division: 400 M.W. CCPP (East), Mechanical, APSCCL
Duration From: January 2023 to June 2023

Sl. No	Type of Incident Occurred	Jan.	Feb.	Mar.	Apr.	May	Jun.	Target for Year
1	Fatality	0	0	0	0	0	0	0
2	Accident (Lost Time Injury/LTI)	0	0	0	0	0	0	0
3	Accident (No Lost Time Injury)	0	0	0	0	0	0	0
4	Minor Injury	0	0	0	0	1	0	0
5	Near miss	0	0	0	0	0	0	0
6	First Aid Provided for Injury	0	0	1	0	1	0	0
Total Number in The Year		1. Fatality: 0 4. Minor Injury: 1		2. Accident (LTI): 0 5. Near Miss: 0		3. Accident (No LTI): 0 6. First Aid Provided: 2		0

Prepared By:
Assistant Engineer (Mechanical), CCPP (East)

Approved By:
Executive Engineer (Mechanical), CCPP (East)

Note: Send this Summary report to Management Representative (MR) & Manager (HS&E)/HS&E Division every following year within 5-15 January.

	ASHUGANJ POWER STATION COMPANY LIMITED	Document No. SF-OHS-24
	FORM	Revision No.: 00
	TITLE: ANNUAL SUMMARY OF ACCIDENT/INCIDENT/FIRST AID	Effective Date: 14 Mar. 15
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Name of Division: 400 M.W. CCPP (East), I&C, APSCL
Duration From: January 2023 to June 2023

Sl. No	Type of Incident Occurred	Jan.	Feb.	Mar.	Apr.	May	Jun.	Target for Year
1	Fatality	0	0	0	0	0	0	0
2	Accident (Lost Time Injury/LTI)	0	0	0	0	0	0	0
3	Accident (No Lost Time Injury)	0	0	0	0	0	0	0
4	Minor Injury	0	0	0	0	0	0	0
5	Near miss	0	0	0	0	0	0	0
6	First Aid Provided for Injury	0	0	1	0	0	0	0
Total Number in The Year		1. Fatality: 0 4. Minor Injury: 0		2. Accident (LTI): 0 5. Near Miss: 0		3. Accident (No LTI): 0 6. First Aid Provided: 1		0

Prepared By:
Assistant Engineer (I&C), CCPP (East)

Approved By:
Executive Engineer (I&C), CCPP (East)

Note: Send this Summary report to Management Representative (MR) & Manager (HS&E)/HS&E Division every following year within 5-15 January.

	ASHUGANJ POWER STATION COMPANY LIMITED	Document No. SF-OHS-24
	FORM	Revision No.: 00
	TITLE: ANNUAL SUMMARY OF ACCIDENT/INCIDENT/FIRST AID	Effective Date: 14 Mar. 15
		Page 1 of 1

Name of Division: 400 M.W. CCPP (East), Operation, APSCL
Duration From: January 2023 to June 2023

Sl. No	Type of Incident Occurred	Jan.	Feb.	Mar.	Apr.	May	Jun.	Target for Year
1	Fatality	0	0	0	0	0	0	0
2	Accident (Lost Time Injury/LTI)	0	0	0	0	0	0	0
3	Accident (No Lost Time Injury)	0	0	0	0	0	0	0
4	Minor Injury	0	0	0	0	0	0	0
5	Near miss	0	0	0	0	0	0	0
6	First Aid Provided for Injury	0	0	0	0	1	0	0
Total Number in The Year		1. Fatality: 0 4. Minor Injury: 0		2. Accident (LTI): 0 5. Near Miss: 0		3. Accident (No LTI): 0 6. First Aid Provided: 1		0

Prepared By:
Assistant Engineer (Operation), CCPP (East)


Approved By:
Executive Engineer (Operation), CCPP (East)

Note: Send this Summary report to Management Representative (MR) & Manager (HS&E)/HS&E Division every following year within 5-15 January.

ANNEX VII: CARBON FOOTPRINT ANALYSIS

BAN: Power System Expansion and Efficiency Improvement Investment Program-Tranche 3					
Ashuganj 400 MW CCPP East Project					
<u>Methodology</u>					
SI	Description		SI	Description	
	Electricity Outputs	MW	7	New Plant Efficiency:	58.75%
1	Grid electricity:	150	8	Emission factor for gas:	56.1 kgCO ₂ /GJ
2	Existing power plant's output:	250	9	Grid emission factor for BAN:	0.0561 tCO ₂ /GJ
3	Project Output:	400	10	fuel consumption per year, GJ/year:	0.648 tCO ₂ /MWh
4	Time (hrs/yr):	8,760			3.6
5	New plant availability:	85%			
6	Old plant availability:	36%			
<u>Calculation</u>					
SI	Description			MWh/yr	
1	Baseline generation from the old power plant (Existing Output*Time*New Plant Availability):			1,861,500	
2	Baseline generation from Grid (Grid*Time*New Plant Availability):			1,116,900	
3	Baseline generation from the old power plant:				
4	Fuel consumption-old power plant: (GJ/year)			18,792,485	
5	Baseline emission—old power plant:			1,054,258	tCO ₂ /yr
6	Baseline emission—grid:			723,751	tCO ₂ /yr
7	Total baseline emission:			1,778,010	tCO₂/yr
SI	Description				
1	Project electricity generation:			2,978,400	MWh/yr
2	Project fuel consumption:			18,250,621	GJ/yr
3	Project Emission:			1,023,860	tCO₂/yr
	Emission Reduction from the Project (Tentative)			754,150	tCO₂/yr

ANNEX VIII: ENVIRONMENTAL CLEARANCE CERTIFICATE




গণপ্রজাতন্ত্রী বাংলাদেশ সরকার
উপপরিচালকের কার্যালয়
পরিবেশ অধিদপ্তর
ব্রাহ্মণবাড়িয়া জেলা কার্যালয়
বাড়ি নং-১৩৬০/৮, নয়নপুর, সদর, ব্রাহ্মণবাড়িয়া।
www.doe.gov.bd

পরিবেশগত ছাড়পত্র
ছাড়পত্র নং: ২২-৭৯৭৭১

পরিবেশগত ব্যবস্থাপনা নিশ্চিতকরণ সাপেক্ষে সংযুক্ত শর্তে নিম্নবর্ণিত প্রতিষ্ঠান/প্রকল্পের অনুকূলে পরিবেশগত ছাড়পত্র প্রদান করা হলো :

প্রতিষ্ঠান/প্রকল্পের নাম	: আশুগঞ্জ ৪০০ মেগাওয়াট কম্বাইন্ড সাইকেল পাওয়ার প্লান্ট (পূর্ব) প্রকল্প
উদ্যোক্তার নাম	: ব্যবস্থাপনা পরিচালক
সনাক্তকরণ নং	: ১১১১৫২
প্রতিষ্ঠান/প্রকল্পের কার্যক্রম	: বিদ্যুৎ উৎপাদন
প্রতিষ্ঠান/প্রকল্পের শ্রেণী	: Red
প্রতিষ্ঠান/প্রকল্পের ঠিকানা	: আশুগঞ্জ পাওয়ার স্টেশন কোম্পানী লিমিটেড, সোনারামপুর, আশুগঞ্জ, ব্রাহ্মণবাড়িয়া।
প্রদানের তারিখ	: ৩০ জুন ২০২২
মেয়াদ উত্তীর্ণের তারিখ	: ০৭ অক্টোবর ২০২৩



এ ছাড়পত্র সনদের সাথে পৃথকভাবে সংযুক্ত প্রদত্ত শর্তাবলী যথাযথভাবে প্রতিপালন করতে হবে, অন্যথায় ছাড়পত্র বাতিল/ক্ষতিপূরণ আদায়সহ যে কোন আইনানুগ ব্যবস্থা গ্রহণ করা হবে।

বিঃদ্রঃ এটি একটি সিস্টেম জেনারেটেড ছাড়পত্র এবং এতে কোনোরূপ স্বাক্ষরের প্রয়োজন নেই।

পরিবেশগত ছাড়পত্র জন্য প্রযোজ্য শর্তাবলী:

ছাড়পত্রটি যাচাই করতে ভিজিট করুন: https://ecc.doe.gov.bd/certificate_verification

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সনাক্তকরণ নং: ১১১১৫২ আন্তঃগণ ৪০০ মেগাওয়াট কয়লাইন্ড সাইকেল পাওয়ার প্রান্ট (পূর্ব) প্রকল্প ছাড়পত্র নং: ২২-৭৯৭৭১

১. এ ছাড়পত্র ৪০০ মেগাওয়াট বিদ্যুৎ উৎপাদনের জন্য প্রযোজ্য। প্রকল্পের উৎপাদন বৃদ্ধি, জায়গা সম্প্রসারণ, উৎপাদন প্রক্রিয়া বা তৎসংশ্লিষ্ট কোনোপ্রকার পরিবর্তনের জন্য পরিবেশ অধিদপ্তরের ছাড়পত্রের প্রয়োজন হবে।

২. বিদ্যুৎ কেন্দ্র হতে গ্যাসীয় পদার্থের নিঃসরণ (SO₂, NO_x এবং CO) এবং বস্তুকণার (Particulate Matters) নির্গমন পরিবেশ সংরক্ষণ বিধিমালা, ১৯৯৭-এর তফসিল-১১ এ উল্লিখিত মানমাত্রার মধ্যে হতে হবে। যে কোন সময় তাৎক্ষণিক সংগৃহীত নমুনা এই মানমাত্রা অতিক্রম হতে পারবে না।

৩. এ ছাড়পত্র জারীর পরবর্তী প্রতি তিনমাস অন্তর হতে বিদ্যুৎ কেন্দ্রের Down wind direction এবং যেসব জায়গায় Ground level Concentration সবচেয়ে বেশি বলে অনুমিত হয় সেসব জায়গার পরিবেষ্টক বায়ুর গুণগতমান (SO₂, NO_x এবং CO) এবং ইটিপি'র মাধ্যমে পরিশোধিত তরল বর্জ্যের গুণগতমান (pH, DO, BOD, COD, TSS) পরীক্ষাপূর্বক উহার বিশ্লেষিত ফলাফল অত্র দপ্তরে দাখিল করতে হবে। বিশ্লেষিত ফলাফল পরিবেশ সংরক্ষণ বিধিমালা, ১৯৯৭ এর গ্রহণযোগ্য মাত্রা বহির্ভূত হলে এ ছাড়পত্র বাতিল বলে গণ্য হবে।

৪. কুলিং ওয়াটার পুনঃব্যবহারের জন্য স্থাপিত সকল ব্যবস্থাদি যথাযথভাবে কার্যক্ষম রাখতে হবে।

৫. বিদ্যুৎ কেন্দ্রের সীমানা প্রাচীরের সন্নিহিত শব্দের মাত্রা শব্দ দূষণ (নিয়ন্ত্রণ) বিধিমালা, ২০০৬ এর তফসিল-১ এ উল্লিখিত মানমাত্রায় থাকতে হবে।

৬. গ্যাসীয় নিঃসরণের জন্য স্থাপিত চিমনীসমূহ সার্বক্ষণিক কার্যক্ষম রাখতে হবে।

৭. জেনারেটরের Spent lubricating oil পরিবেশ অধিদপ্তরের ছাড়পত্র গ্রহণকারী প্রতিষ্ঠান ব্যতিরেকে অন্য কোন Vendor এর কাছে বিক্রয় করা যাবে না।

৮. বিদ্যুৎ কেন্দ্র সৃষ্ট Residual Filtrate অথবা তৈলমিশ্রিত বর্জ্য কোন জলাশয়ে ফেলা যাবে না।

৯. ইআইএ প্রতিবেদনে উল্লিখিত সকল মিটিগেশন মেজার্স সার্বক্ষণিক কার্যকরীভাবে চালু রাখতে হবে।

১০. বিদ্যুৎ কেন্দ্র চত্বরের ন্যূনতম ৩৩% জায়গা উপযুক্ত প্রজাতির ফলদ ও বনজ গাছ লাগিয়ে সবুজায়ন করতে হবে।

১১. আলোচ্য প্রকল্পের চারপাশের সীমানার সন্নিহিত শব্দের মাত্রা নিয়মিত মনিটর করতে হবে এবং মনিটরিং ফলাফল প্রতি তিন মাস অন্তর পরিবেশ অধিদপ্তরে দাখিল করতে হবে।

১২. এ ছাড়পত্র জারীর ০৬(ছয়) মাসের মধ্যে তরল বর্জ্য রিসাইক্লিং ও জিরো ডিসচার্জ পরিকল্পনা দাখিল করতে হবে। অন্যথায় ছাড়পত্র নবায়ন করা হবে না ও ছাড়পত্র বাতিল করা হবে।

১৩. পেশাগত স্বাস্থ্য রক্ষার্থে সকল ব্যবস্থা সার্বক্ষণিক চালু রাখতে হবে। কর্মরত শ্রমিকদের পেশাগত স্বাস্থ্য সুরক্ষার জন্য ব্যক্তিগত সুরক্ষাসামগ্রী (যেমন: হেলমেট, ইয়ার মাফলার, বুট) পরিধান করতে হবে।

১৪. অগ্নি নিরাপত্তা ব্যবস্থা নিশ্চিত করার লক্ষ্যে বাংলাদেশ ন্যাশনাল বিল্ডিং কোড এবং ফায়ার লাইসেন্সের শর্তানুসারে উপযুক্ত ব্যবস্থাদি সার্বক্ষণিক কার্যকরী রাখতে হবে।


১৫. বাংলাদেশ পরিবেশ সংরক্ষণ আইন, ১৯৯৫ এবং তদধীন প্রণীত বিধিমালা এ প্রদত্ত ক্ষমতাবলে উপরিলিখিত শর্তসমূহ Enforce করা হবে।

১৬. ছাড়পত্রের মূলকপি প্রতিষ্ঠানে সংরক্ষণ করতে হবে। পরিবেশ অধিদপ্তরের এনফোর্সমেন্ট টিম, পরিদর্শক, পরিদর্শনের ক্ষমতাপ্রাপ্ত কর্মকর্তাগণ কারখানা পরিদর্শনকালে ছাড়পত্র/নবায়ন পত্র প্রদর্শন এবং প্রতিষ্ঠানের কার্যক্রম পরিদর্শনে সহযোগিতা করতে হবে।

১৭. উপরোক্ত সকল অনুল্লেখিত বর্ণিত শর্তাবলী যথাযথভাবে প্রতিপালনের ক্ষেত্রে সংশ্লিষ্ট কর্তৃপক্ষের কোনরূপ উদাসীনতা, শিথিলতা বা যে কোন শর্তের লংঘন পরিবেশ দূষণ সংশ্লিষ্টতায় জনস্বাস্থ্যের প্রতি হুমকি বিবেচনায় প্রদত্ত ছাড়পত্র বাতিলসহ আপনার/আপনার প্রতিষ্ঠানের বিরুদ্ধে বাংলাদেশ পরিবেশ সংরক্ষণ আইন, ১৯৯৫ (সংশোধিত ২০১০); পরিবেশ সংরক্ষণ বিধিমালা, ১৯৯৭ এবং শব্দ দূষণ (নিয়ন্ত্রণ) বিধিমালা, ২০০৬ অনুসারে আইনগত ব্যবস্থা গ্রহণ করা হবে।

ছাড়পত্রটি যাচাই করতে ভিজিট করুন: https://ecc.doe.gov.bd/certificate_verification

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24.07.2023
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