



Addendum to Environmental Monitoring Report

PUBLIC

Semestral Report: January 2021 – June 2021
December 2024

India: Assam Power Sector Investment Program - Tranche 3

Prepared by Assam Power Generation Corporation Limited (APGCL) for the Asian Development Bank (ADB). This is an addendum to environmental monitoring report originally posted in July 2021 available on <https://www.adb.org/projects/documents/ind-47101-004-emr>.

Asian Development Bank

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Validation of Semi-Annual Environmental Monitoring Report
For
Environmental Safeguard Implementation from January to June 2021
120 MW Lower Kopili Hydro Electric Project

Submitted to
Assam Power Generation Corporation Limited

SFG Log: 6404-B



Submitted by
Feedback Infra Private Limited ENERGY DIVISION
AQUALOGUS – Engenharia e Ambiente, Lda
Jade Consult Pvt. Ltd.



Validation of Semi-Annual Environmental Monitoring Report (Jan-June 21)

Action → Category ↓	Description	1	2	3	4	5
A	For Approval	Released For Construction	Clear Approval	Approved With Comments	Approved With Comments but Resubmit with Revision	Disapproved
B	For Reference	X				
C	As Built					
D	Preliminary For Information Only					


Lower Kopili Hydroelectric Project (LKHEP) 120MW

Consultancy Services for External Monitoring of LKHEP 120 MW
Contract No. APGCL/ADB/Tranch-3/LKHEP/External Monitoring DATED: 24TH December 2021

PURPOSE:

External Monitoring for implementation of Environment and Social (E&S) safeguard aspects as per the requirements of national regulatory requirements and ADB's SPS 2009 For 120 MW LKHEP during design, construction, and operation Phases

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1	Submission to Client	28/10/2024	AQ, AW, SM, VR,JK, LC	SM	SM
Rev.	Description	Date	Prepared	Checked	Approved

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List of Abbreviations

ADB	Asian Development Bank
APGCL	Assam Power Generation Corporation Limited
APs'	Affected Persons
CAP	Corrective action plan
CAT	Catchment Area Treatment
CTO	Consents to operate
CTE	Consents to establish
EHS	Environment Health and Safety
EC	Environment Clearance
EMP	Environmental Management plan
EMoP	Environmental Monitoring Plan
ESHS	Environmental Social Health and Safety
EIA	Environmental Impact Assessment
FC	Forest Clearance
GOA	Government of Assam
HO	Head Office
LKHEP	Lower Kopili Hydroelectric Project
MoEF & CC	Ministry of environment Forest and Climate Change
MPR	Monthly Progress Reports
NGT	National Green Tribunal
NGO	Non-Governmental Organisation
PMC	Project Management Contractor
SEMR	Semi Annual Environment Monitoring Report
SPS 2009	Safeguard Policy Statement
TOR	Terms of Reference

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1.0 PROJECT SYNOPSIS

Name of the Project		Consultancy Services for External Monitoring of LKHEP 120 MW
Client Name	Assam Power Generation Corporation Limited	
Consultant Agency	M/s Feedback Infra Pvt. Ltd AQUALOGUS – Engenharia e Ambiente, Lda. Jade Consult Pvt. Ltd.	
Project Area	Lower Kopili H. E. Project (LKHEP) is located in Karbi Anglong and Dima Hasao District in north-eastern State of Assam, India The details are provided in the subsequent sections of this report.	
Project Duration	6 Years	

2.0 PROJECT BACKGROUND

1. Assam Power Generation Corporation Limited (APGCL) is executing a 120 MW Lower Kopili Hydroelectric Project (LKHEP). APGCL through Government of Assam (GoA) and subsequently through Government of India (GOI) has applied for a loan from the Asian Development Bank (ADB) towards the cost of LKHEP under Assam Power Sector Investment Program (APSIP) - Tranche 3.
2. The LKHEP involves construction of 120 MW hydroelectric power plants and associated 50 km long 220 KV transmission line in north-eastern State of Assam, India. LKHEP is designed to operate as a run-of-river power plant with diurnal storage with a total capacity of 120 Megawatts (MW) comprising a main plant rated at 110 MW (2X55MW) and an auxiliary plant rated at 10 MW (1x5 MW+2x2.5 MW) at the toe of the dam for utilizing the mandatory release of water for ecological purposes. The scheme has been contemplated to run at full potential in monsoon season and operate as a peaking station in non-monsoon season.
3. The project will use the hydropower potential of the Kopili River, a south bank tributary of the Brahmaputra River. The proposed LKHEP is downstream development of existing Kopili HEP. The LKHEP is located in Karbi Anglong and Dima Hasao districts of Assam. The Project location (dam site at Longku) is defined by 25°39'57.39" N latitude and 92°46'53.62" E longitude. The project envisages utilization of the regulated discharge from Kopili HEP, spills of Khandong and Umrong Dam and the discharge from the intermediate catchment.
4. The LKHEP (subproject) is classified as Environment Category A, in accordance with ADB's Safeguard Policy Statement (SPS 2009). Additionally, based on the results of the climate change risk assessment, the subproject is High Risk for Multi-Hazard Index and Climate. To fulfil national

regulatory requirements and ADB's SPS 2009, APGCL prepared an Environmental Impact Assessment (EIA) with environmental no-objection obtained from the Ministry of Environment, Forest, and Climate Change of Government of India. In addition, APGCL developed a Resettlement and Indigenous Peoples Plan (RIPP) comprised of a Combined Resettlement and Tribal Development Plan (CRTDP) for hydropower component, and a Combined Resettlement and Indigenous Peoples Plan (CRIPP) for transmission line component.

5. As required by the ADB's SPS 2009 and Access to Information Policy (AIP) 2019, draft EIA was disclosed in April 2018 and Resettlement and Tribal Development Plan (RIPP) in October 2018.

3.0 PROJECT SALIENT FEATURES

6. The dam proposed to be built at Longku will be a concrete gravity dam, of height 65 m and top longitudinal cross section 335 m. The crest of the dam will be 229 m above mean sea level (MSL). The dam will create a reservoir at Longku with a spread of 620 hectares (ha), with live storage of 77 million cubic meter. A tunnel will be excavated to deliver the water from the reservoir to the main power plant. Water from the intake to the main power plant enters the tunnel of diameter 7.0 meter on the right bank of the Kopili river. This tunnel will be 3.641 kilometer (km) long. At the end of this low-pressure tunnel, water will enter the pressure shaft. The pressure shaft will be circular of 6.1 m diameter (UG section, 462m); Surface backfill 6.1m diameter (159m); Inclined surface 5.2 m diameter (89m), steel lined. The pressure shaft will deliver water to two steel penstocks each of length of about 60 m, which in turn would convey water to the turbines. Water to the auxiliary power plant will be taken directly along a steel-lined circular pressure shaft of diameter 2.7 m and of length 70 m, and delivered to the turbine through three steel penstocks, each about 30 m long (Annexure-I and II) . The designed discharge capacity is 112.7 cubic meter per second (m/s), at a flow velocity of 3.13 m/s.
7. The project's salient features are given in **Table 1.1**.

Table 1.1: Project Salient Features

Particulars	Description	
Name of the Project	Lower Kopili Hydroelectric Project	
State	Assam	
District	East of Karbi Anglong and West of Dima Hasao (North Cachar) Hills District (Project Location Map is attached as Annexure-I)	
River	Kopili	
Catchment area	2,076.62 sq. km	
Environmental flow (e-flow)	Minimum 5.345 m ³ /s	
DAM		
Dam Type	Concrete Gravity Dam	
Maximum height of the dam	65.50 m	
Overflow spillway for debris removal size (W x H)	4.0 m x 3.0 m	
Sluice spillway No. & size (W x H)	6 Nos., 10 m x 12.50 m	
Sluice spillway capacity	11,030 m ³ /s	
Gate type and Number	Radial gate and 6 No. with hydraulic hoist	
RIVER DIVERSION		
Diversion type	Coffer dams, Diversion Tunnel of 10.5 m diameter at right bank	
Upstream Coffer dam		
Type	Plum Concrete	
Height	21.50 m	
Top Length and Level	179.5 m, EL. 193.0 m	
Downstream Coffer dam		
Type	Earth & Rockfill	
Height	10.0 m	
Top Length and Level	132.0 m, EL.181.0 m	
INTAKE	MAIN POWERHOUSE	AUXILIARY POWERHOUSE
Number of openings	1	1
Nominal discharge	112.71 m ³ /s	24.94 m ³ /s (e-flow of 5.345 m ³ /s within this)
HEAD RACE TUNNEL		
Location	Right bank of Kopili river	
Length	3,641.60 m	
Nominal discharge	112.71 m ³ /s	

ADIT-1 TO HRT		
Shape and Size	D-Shape, 6.0 m	
Length	354.66 m	
Type & Number of Gate	Hinge type, One	
Gate Size (W x H)	2.5 m x 2.5 m	
SURGE SHAFT		
Type	Restricted orifice type	
Diameter	25 m	
VALVE HOUSE		
Type & Number	Surface	
Size (L x W x H)	23 m x 14 m x 27.50 m	
PRESSURE SHAFT	MAIN POWERHOUSE	AUXILIARY POWERHOUSE
Type	Circular steel lined	Circular steel lined
Nominal discharge	112.71 m ³ /s	24.94 m ³ /s
Length of pressure shaft Length of Surface Penstock	610m (Dia 6.1m)/ 81.9 m (Dia 5.2m)	64 m
Number of pressure shaft	1	1
Specification of steel plates	ASTM A537	ASTM A537
Penstock	2	3
Internal diameter	3.70 m	2 Nos.1.65 m & 1 No.2.35 m
Length	16.3 m	26.20 m/ 26.20 m/ 24.20 m
POWERHOUSE	MAIN POWERHOUSE	AUXILIARY POWERHOUSE
Installed capacity	2x55 MW=110 MW	2x2.5 MW+1x5 MW=10 MW
Location	Right side of river Kopili	Right side of river Kopili
Type	Surface powerhouse	Surface powerhouse
Powerhouse dimensions (L x W x H)	76.5 m x 19.1 m x 30 m	50.5 m x 10 m x 27 m
Average gross head	114 m	48.30 m
Type of turbines	Francis, vertical	Francis, horizontal
Number of units	2	3
Installed capacity per unit	55 MW	2.5 MW / 5 MW
TRANSFORMER YARD		
Type	1 phase, ONAN/ONAF	3 phase, ONAN/ONAF cooled Generator Transformer

Location	Upstream of powerhouse	Upstream of powerhouse
Number	7 (6+1 spare) nos.	2 nos.
Rated capacity	24 MVA	6.5 MVA
TAIL RACE CHANNEL		
Type	Rectangular Channel	Rectangular Duct
Numbers	1	Three separate ducts merging into one common duct
Size (L x W)	208.4 m x 26 m	43.40m for 5 MW unit 29.65m for 2.5 MW Units
SWITCH YARD		
Type & Size	Outdoor-146 m x 72 m	Outdoor-24 m x 21 m
Voltage level	220 kV	33 kV
CONSTRUCTION PERIOD		
Total construction period	4 Years	

3.1 PROJECT PROGRESS STATUS

8. The project is divided in to 4 packages and their selection, and work progress is reported in table 1.2 below:

Table 1.2: Package wise progress of project in the period Jan-June 2021

S.N.	Contract Packages	Nature of Work	Date of Award	Name of Contractor	Work Status/Physical Progress (June 21)
1	CP-1	Establishing Housing colony for APGCL officers	Yet to be awarded	Tender under Preparation	
2	CP-2	Civil and Hydro mechanical works for the Dam and ancillary structures	21.08.2020	L&T	18%
3	CP-3	Electromechanical Works	Yet to be awarded	About to be awarded	
4	CP-4	Transmission Lines	Yet to be awarded	Bid doc forwarded to ADB.	

3.2 SCOPE OF WORK, VALIDATION OF SEMR BY EXTERNAL MONITORING CONSULTANT:

9. M/s Feedback Infra Pvt. Ltd. in JV with M/s Jade and M/s Aqualogus has been engaged by APGCL as External Monitoring Consultant (EMC) to provide technical guidance and monitor the implementation and effectiveness of Environmental and Social (E&S) Safeguards activities as per the requirements of national regulatory requirements and ADB's SPS 2009 safeguards requirements with respect to project construction activities. External Monitoring Consultant are required to verify the status of mitigation and monitoring activities for the project, with overall supervision of the implementation of:
 - ✓ Compliance conditions stipulated under various clearances, permits, and NOCs obtained for the project.
 - ✓ Environmental safeguard requirements as given in the ADB SPS 2009
 - ✓ Compliance with loan covenants related to Environmental Safeguards
 - ✓ Independent monitoring of the implementation of the Environmental Management Plan by the Construction Contractors
10. EMC was appointed in December 2021. The current validation of SEMR (Jan-June 21) was done through desktop verification and validation.
11. The verification and validation studies were carried out employing the following approach:
 - ✓ Desktop-based review of documentation and literature such as previous Monthly and Quarterly Progress reports for the project, Six-month Environmental Monitoring Reports, other records, and plans.
 - ✓ Validation and verification of compliance status of various permissions (CTEs, CTOs, groundwater abstraction permissions, tree cutting permissions, etc.)
 - ✓ Validation, verification, and compliance status of ADB's loan covenants
 - ✓ Validation and verification of the compliance status of EMP implementation measures

4.0 IMPLEMENTATION OF THE ENVIRONMENTAL SAFEGUARDS

Implementation Arrangement:

12. As the project's Executing Agency (EA), APGCL is responsible for carrying out all environmental protection measures. APGCL has a fully operational Project Management Unit (PMU) and a dedicated Social and Environmental Safeguards Cell (SESC), both of which are overseen by a Project Director (PD). The SESC coordinates overall environmental safeguards activities for the project, including the implementation of environmental and social safeguards plans and compliance monitoring. The SESC has one qualified environment expert and one qualified social expert, both on a contract basis. There was no change in staffing during the reporting period.

13. The APGCL is supported by the Project Management Consultant (PMC) that was awarded to AF Consultant. The safeguard team of PMC comprised of a qualified Environmental Expert and one Social Safeguard Expert.
14. An organogram showing the relationships and staffing for environmental and social protections between the executing and implementing agencies, the project management consultant, contractors, and the external monitoring consultant is presented below:

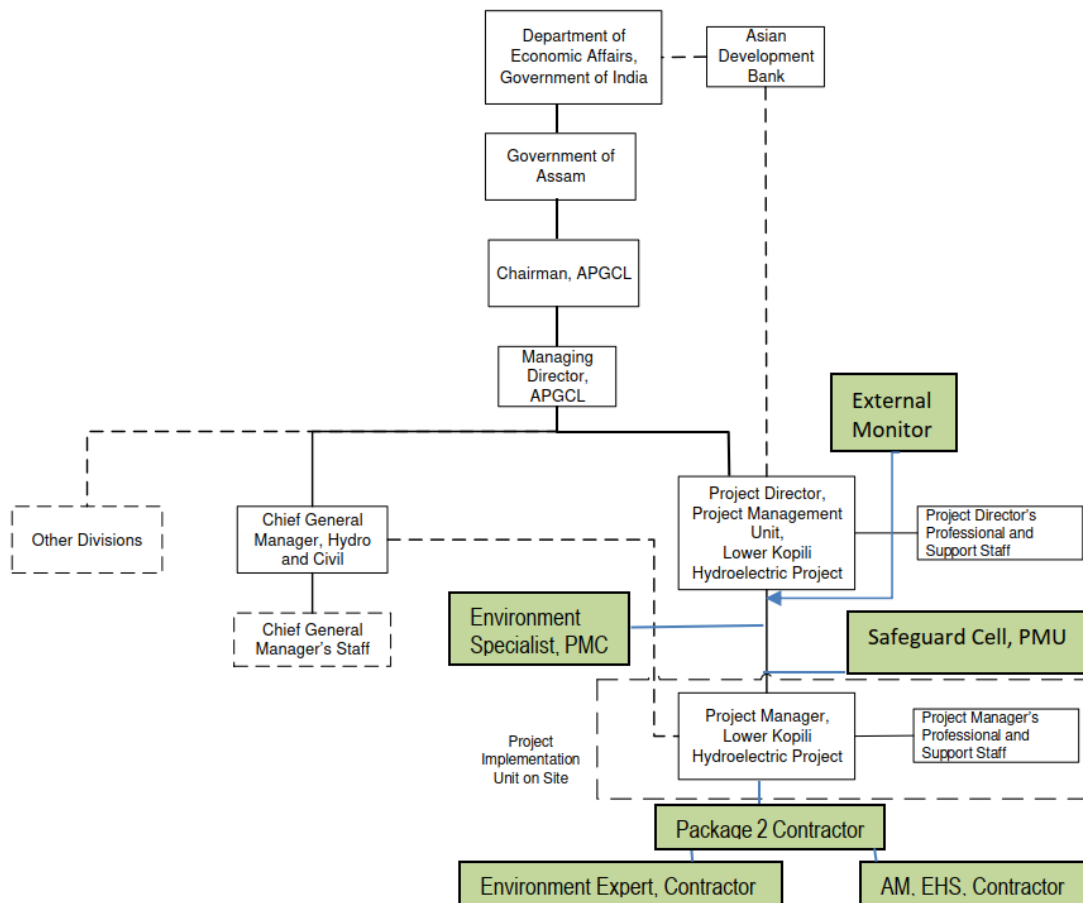


Figure 1: Organogram for implementation of Environmental and Social Safeguard for the LKHEP (120 MW)

5.0 Assessment of prerequisite for EMP implementation:

15. To assess the readiness of EMP implementation, the External Monitoring Consultant first determined if the APGCL was prepared to proceed with the construction of the proposed project and transmission line. The indicators used for the assessment are listed in **Table 2.1** below:

Table 2.1: EMP Readiness Assessment

Indicator	Assessment Criteria	Compliance	Remarks
EIA approval and disclosure	The EIA was cleared by ADB and disclosed on ADB's project website in June 2018 The copy of the EIA is yet to be disclosed in the website of APGCL.	Partially Complied	
Mitigation measures described in the EMP adopted during detailed design and construction of the project	Measures defined in EIA and EMP are included in detailed designs for each project component. Bidding document of Package 2 (Civil and Hydromechanical) includes relevant sections of the EMP cleared by ADB.	Complied	EMP and the EMoP have been included as part of the contract documents of CP-2.
Compliance with loan covenants	The borrower complies with loan covenants related to project design and environmental management planning.	Being Complied	Detail provided in section 2.3.
Environmental Monitoring	The monitoring parameters, locations, and methods for the ambient air, noise and surface water defined in the EMoP.	Being Complied	This is a continuous process and has been initiated by CP-2 in the reporting period for ambient air, noise, and water quality. Details reported in Annexure 11 of SEMR.

5.1 ENVIRONMENTAL COMPLIANCE STATUS

16. The compliance status of the project's implementation has two aspects:

- Compliance status with National/State/Local statutory environmental requirements
- Compliance status with ADB's loan covenants affecting environmental parameters.

17. Checking the status of compliance serves the objective of confirming and validating any deviations from loan covenant conditions and project-specific environmental law requirements.

5.2 COMPLIANCE WITH NATIONAL/LOCAL STATUTORY REQUIREMENT

18. The SEMR have rightly presented the availability and pending status of all the necessary statutory consent, approval, permit, and clearance during the period Jan 2021 to June 2021.

19. The project has received the following clearances and permissions:

- ✓ Environment Clearance was accorded to the project on 4th September 2019.
- ✓ Stage-I Forest clearance received on 5th February 2019 and Stage-II on 4th December 2020
- ✓ Possession of diverted Reserved Forest and Proposed Reserved Forest land measuring 477.76 Ha. under Garampani & Panimur range was handed over on 11th Jun'21 for the construction of 120 MW LKHEP.
- ✓ Permission for installation of batching plant at Totelangso, Dima Hasao received from Gaon Burah on 30.06.21
- ✓ Permission received from labour commissioner for CP-2 contractor for 250 labours.
- ✓ Although no formal NOC received for tree cutting, tree cutting is only done in presence of forest department officials. A joint verification report of tree cutting is enclosed in Annexure 8 of SEMR.

During this period the consents, permits that are still pending and required are reported in **Table 2.2** along with their latest position (if the permission is received in the subsequent months) is also mentioned.

Table 2.2: Compliance with Statutory Requirements

S.N.	Outstanding issue	Compliance Status	Remarks
1	Permission of Pollution Control Board for installation of crushers.	Being Complied.	Application submitted to Pollution Control Board Assam, Silchar vide Application No. 581837.
2	Permission of Pollution Control Board for installation of batching plants.	Being Complied.	Application submitted to Pollution Control Board Assam, Silchar vide Application No. 590529
3	Land handover of Karbi Anglong Forest Land	Being complied	Awaited
4	Mining permit 4.6 hectare, Near Kala Nala for Coarse Aggregates	Pending	Approval Awaited from North Cachar Hill Autonomous council (NCHAC).

S.N.	Outstanding issue	Compliance Status	Remarks
5	(NOC) from Deputy Commissioner Govt of Assam, for setting up Fuel dispensing Unit	Pending	NOC from Hon'ble Deputy Commissioner, Govt. of Assam yet to be received.
6	NOC from PESO	Pending	Under process
7	NOC for blasting operations	Pending, application submitted in May 21	Approval awaited from Deputy Commissioner, Dima Hasao District
8	Permission for storage of Explosives (Explosive Van) at Longku police station for blasting operation	Permission received	

Verification & Validation of Statutory Clearances:

20. The available NOCs and NOC's pending are clearly indicated in the SEMR (Jan-June 21) and the status of the pending permissions are required to be updated in the subsequent SEMRs.

21. From the verification of desktop documents it is noted that:

- ✓ Crusher construction started before getting CTE by CP-2 contractor;
- ✓ Batching plant construction started before getting CTE by CP-2 contractor;
- ✓ Labour license taken up by CP-2 contractor is for 250 workers but there are possibility of involving more workers which should always be avoided.
- ✓ CP-2 has followed COVID-19 guidelines issued time to time by Govt of India and Govt of Assam with necessary SOP for persons arriving at Assam to go for compulsory home quarantine for 7 days.
- ✓ Month wise covid test results and positive and negative cases are also mentioned in the report and enclosed in SEMR (Jan-June 21) between pages 138-139.
- ✓ Staff vaccination status of 93 staffs are also presented including the status of 1st and 2nd dose of covid vaccination.
- ✓ During the reporting period the workers camps namely "Lohit", Manas was completed along with their toilet and shower blocks.
- ✓ The accommodation for the APGCL and PMC was completed at Dihing block.
- ✓ NOC for the usage of surface water usage need to be obtained before the actual usage.
- ✓ Since batching plant will be established necessary treatment measures for the batching plant slurry need to be included and status may be reported in the next SEMR.
- ✓ Sample PUC are enclosed in Annexure 7 of SEMR and it has been mentioned that all the vehicles used are having necessary PUC. EMC will verify the same in the next SEMR validation report (Jul-Dec 21).

- ✓ At present, drinking water for the camps are taken from 2 borewell and later treated in RO before use. During lean months mineral water bottles of 20 liters are used for drinking.
- ✓ During the period kitchen block was under construction.
- ✓ The Aquatic Ecology in and around the proposed project and surrounding areas (river Kopili) has also been affected grievously by acid drainage due to illegal and uncontrolled rat hole mining upstream in State of Meghalaya. India's National Green Tribunal (NGT) passed a directive in April 2014 to ban rat hole mining in Meghalaya leading to some improvement to the downstream aquatic ecology. The river pH level is requires continuous monitoring and need to be reported in the next SEMRs to take up necessary protection measures for the dam structures.

5.3 ENVIRONMENTAL LOAN COVENANT COMPLIANCE

22. The loan agreement between ADB and the Government of India was signed for the Assam Power Sector Investment Programme (Project 3) on December 30, 2020. The Environmental loan covenants are mostly described in Schedules 4 and 5 of the loan agreement. Schedule 4 of the agreement provides details of "Procurement of Goods, Works, and Consulting Services." Under this schedule, Paras. 6 and 8 pertain to compliance. Paragraph 6 specifies that no work shall commence until and unless the EIA for the scheme is approved, and Paragraph 8 mentions the selection of an external monitoring consultant and the validation of Environmental Monitoring reports by APGCL. Schedule 5, on the other hand, is related to "Execution of Projects", its implementation arrangements, safeguarding the environment and social, safeguard-related provisions in the bidding documents and works contracts, and safeguard monitoring and reporting.
23. The loan covenants for environmental safeguards stated under various schedules of the loan agreement are either complied with or being complied with and are presented in **Table 2.3**.

Table 2.3: Compliance with Loan Covenants

S. N.	Reference	Specific covenant/condition	Compliance as on December 2023	Remark
1	Schedule 4, Para 6 related to clearance of updated EIA by ADB	The borrower shall ensure or cause the APGCL to ensure that it shall not allow commencement of civil works under a works contract which involves environmental impacts until the APGCL has obtained the final approval of the EIA from the relevant Environmental Authority of the borrower and the state and the ADB;	Being complied.	The main EIA, along with three supplementary EIAs, was cleared by ADB in 2018, and Environmental clearance was granted by MoEF&CC via an EC letter dated September 4 th 2019. If there s any specific design change, change in submergence area then there might be a need for EC amendment in future along with EIA addendum. The details of the same may be reported in the next SEMR.
		(ii)APGCL has incorporated the relevant provisions from the EMP into the works contract of CP-2	Being Complied	
		(iii) the EIA is updated to reflect the turnkey contractors’ detailed design and up to date baseline and	Being Complied.	
		(iv) such updated EIA is cleared by ADB		
2	Schedule 4, Para8 related to engagement of EM and submission of various reports to ADB	The borrower shall ensure or cause the APGCL to ensure to recruit a consulting firm for external validation of the Environmental Monitoring report produced by APGCL.	Pending	APGCL is in process of engaging an External Monitor.
		The Borrower shall ensure or cause the APGCL to apply individual consultant selection for Consulting Services.	Being complied by APGCL	

S. N.	Reference	Specific covenant/condition	Compliance as on December 2023	Remark
3	Schedule 5, Para 5, related to Health and Safety measures and its inclusion in Contractor's design	The borrower shall ensure or cause the APGCL to ensure that the preparation, design, construction, implementation, operation and decommissioning of the project and all the project facilities comply with (a) all applicable laws and regulations of the borrower and the state relating to Environment, Health and Safety (b) The Environmental Safeguards, (c) the EARF (d) all the measures and requirements set forth in the EIA and EMP and any corrective or preventive action set forth in a Safeguard Monitoring Report.	Being complied.	Few permission has been received and reported in the SEMR for the reporting period and many more permissions are still pending and are adequately captured in the SEMR. The updated status to be mentioned in the next SEMR (Jul-Dec 21).
4	Schedule 5, Para 9, budgetary provision, and human resource provision related to full implementation of EMP	The borrower shall ensure or cause the APGCL to ensure that all necessary budgetary and human resources to fully implement the EMP and the RIPP as required are made available on a timely basis.	Being complied	At present there is no EHS expert at APGCL/PMC. It is suggested that qualified and well-experienced EHS experts are appointed for EHS and OHS compliance and supervision.
5	Schedule 5, Para 10: Safeguard related documents in bidding document and works document.	Safeguard Related Provisions in Bidding Document and Works contracts: The borrower shall ensure or cause the APGCL to ensure that all bidding documents and contractor for	Being Complied.	Such details are included in the bid document for the individual work items of CP-2. Similar approach to be followed for the other contractors contract document as well.

S. N.	Reference	Specific covenant/condition	Compliance as on December 2023	Remark
		works contain provisions that require contractors to: comply with the measures and requirements relevant to the contractor set forth in the EIA, EMP and the RIPP and any corrective or preventive actions set forth in a safeguard Monitoring Report;		
		(ii) budget for environment and social measures;	Being Complied	Budget is presented in Table 10 of SEMR. The expenditure details to be included in the next SEMRs (Jul-Dec 21 onwards).
		(iii) unanticipated environmental and social risks that arise during construction, implementation and operation stage of the project and is not included in the EIA/EMP or RIPP, RF or IPPF.	Being complied	
		(iv) Record conditions of roads, agricultural land other infrastructure prior to starting transport materials and construction.	Being Complied	The CP-2 contractor has initiated the excavation of permanent roads no. 1,4,5,6,7,8,9,10 for various ancillary facilities like approach roads for reaching the dam site, powerhouse site, and other ancillary areas of the project for the transport of construction materials.
		(v) fully reinstate pathways, other local infrastructure, and agricultural land to their pre-project conditions upon completion of construction	Being Complied	

S. N.	Reference	Specific covenant/condition	Compliance as on December 2023	Remark
6	Schedule 5, Para 11: Safeguard Monitoring and Reporting	The borrower shall ensure or cause the APGCL to ensure the following: Submit semi-annual Safeguard Monitoring Reports to ADB and disclose relevant information from such reports to affected persons promptly upon submission.	Being Complied	Semi-annual safeguards monitoring reports are being submitted to ADB for review on a regular basis;
		(ii) 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, EMP, RIPP, RF or the IPPF as applicable promptly inform ADB of the occurrence of such risks or impacts with detailed description of the event and proposed corrective action plan and	Not applicable yet	If required an EIA addendum may be submitted to ADB in the subsequent months.
		(iii) report any breach of compliance with the measures and requirements set forth in the EMP or RIPP promptly after becoming aware of the breach.	Being complied	Semi-annual safeguards monitoring reports are being submitted to ADB for review. Further compliance with corrective actions (if any) need to be submitted accordingly.
7	Schedule 5 para 12, (Prohibited Investment Activities)	The Borrower shall ensure, or cause the APGC to ensure, that no proceeds of the Loan under the Project are used to finance any activity included in the list of	Being complied	The project scope does not include any activity included in the list of prohibited investment activities.

S. N.	Reference	Specific covenant/condition	Compliance as on December 2023	Remark
		prohibited investment activities provided in Appendix 5 of the SPS.		
8	Schedule 5 para 13, Labour Standards, Health and Safety	Labour Standards Health and Safety. The Borrower shall ensure or cause the APGCL to ensure that works contracts under that Project follow all applicable labour laws of the Borrower and the State and that these further include provisions to the effect that the contractors: (i) carry out HIV / AIDS awareness programs for labour and disseminate information at worksites on risks of sexually transmitted diseases and HIV / AIDS as part of health and safety measures for those employed during construction.	Partially Complied	Labour license has been taken up by CP-2 contractor for 250 labours. No instance of child labour forced labour, or discrimination in job opportunities was reported in the EMRs. SEMR reported that during the health camps workers were given instructions related to communicable diseases including HIV and its preventive measures.
		(ii) follow and implement all statutory provisions on labour (including not employing or using children as labour, equal pay for equal work) health, safety welfare, sanitation, and working conditions.	Partially complied	Sanitation facilities in labour camps of CP-2 are being established. Not applicable for the other contract packages. Drinking water facility established, quality test reports to be included from the next SEMRs.
		(iii) Such contracts shall also include clauses for termination in case of any breach of the stated provisions in the contract.	Being complied	

6.0 COMPLIANCE TO ENVIRONMENT MANAGEMENT PLAN:

24. The main EIA, along with three supplementary EIAs, was cleared by ADB in 2018, and Environmental clearance was granted by MoEF&CC via an EC letter dated September 4th 2019. The revised EIA Addendum is under preparation, and the amendment of the EC is also under process.
25. The Main EIA and the supplementary EIAs also consist of an Environment Management Plan (EMP) with detailed mitigation measures. The time frame and location for implementation of such mitigation measures are also defined in the EMP, along with costs and responsible agencies for the implementation and supervision of the EMP. At present the EMP is included in the bidding/contract document of CP-2 only. The other contract packages are yet to be awarded.
26. In addition, an Environmental Monitoring Plan (EMoP) has been prepared to guide key monitoring activities and ensure the effectiveness of EMP implementation. CP-2 contractor who are currently working on the project are assigned the duty of adhering to all management strategies outlined in the EMP. They need to adhere to all applicable laws and ADB's safeguard specifications. Additionally, CP-2 contractor also need to adhere to any project-specific regulations for soil, water, air, noise, and biodiversity.

6.1 BIODIVERSITY CONSERVATION AND WILDLIFE MANAGEMENT PLAN

27. For terrestrial Ecology, Camera trap not initiated but will be carried out as soon as the External monitor engaged. However, monitoring done during Biodiversity study in February, 2021 and report submitted.
28. During the Biodiversity study 3 additional threatened species of mammals were reported from the project area and within 10 km radius of the project site. They are Western Hoolock gibbon (*Hoolock hoolock*) Endangered, Bengal Slow loris (*Nycticebus bengalensis*) Endangered, Leopard (*Panthera pardus*) Vulnerable. All the 3 species are under Schedule I of the Wildlife Protection Act, 1972 and its amendments.
29. As per EIA a compensatory afforestation and biodiversity conservation and management plan has been prepared (Annex 9) and APGCL will undertake compensatory afforestation through State Forest Department 523.046 Ha in Revenue Land (mutated to Reserved Forest) and conversion of temporary use areas to green belt (69.95 Ha and 11 Ha), it comes to 603.996 Ha. Moreover, APGCL will maintain 198.746 Ha Forest land as Green Belt and 26.55 Ha as Safety area as stipulated in the Forest Clearance of MoEF&CC. Hence total Green belt coverage comes to 829.292 Ha.
30. PMC and APGCL team provided on training on Biodiversity monitoring on 19.02.2021.
31. Detailed biodiversity report is enclosed in section 7.2 of SEMR which has covered the plant and faunal diversity.
32. Annual bird count is also not initiated in the current reporting period.
33. **Compensatory Afforestation Programme:** As per departmental norms, the Forest Department will implement the CA. The Forest Department, Govt. of Assam, has taken up the CA for Dima Hasao and Karbi Anglong. In the current reporting period CA was not initiated.

34. **Tree Cutting**- Tree cutting in progress with assistance/ presence of officials of Forest Department, Panimur, APGCL has deposited the amount for tree cutting, dragging, construction of depot, etc to both the forest divisions.
35. Although no formal NOC received for tree cutting, tree cutting is only done in presence of forest department officials. A joint verification report of tree cutting is enclosed in **Annexure 8** of SEMR.
36. A biodiversity monitoring committee needs to be formed and requisite nomination may be obtained from concerned department.

6.2 CATCHMENT MANAGEMENT PLAN

37. As a requirement, the Catchment Area Treatment Plan (CATP) as proposed in the EIA/EMP report needs to be implemented in consultation with the State Forest Department and in synchronisation with the construction of the project.
38. As per the Stage I condition of the Forest Clearance Project Proponent has to deposit the CAT (Catchment Area Treatment) Plan budget in the CAMPA Fund prior to Stage II Forest Clearance. Accordingly, the amount was deposited in CAMPA fund of MoEF&CC. The work on Catchment Area treatment has not been initiated by the Forest Department. APGCL will pursue the matter with the Forest Department for implementation. The update on the same may be included in the subsequent SEMRs.
39. Necessary awareness programme was conducted for the conservation of biodiversity, one training was conducted on 19.2.21 at Longku. More frequent trainings may be needed with more participants.

6.3 FISH MANAGEMENT PLAN

40. As per the supplementary EIA (Vol. 3), It is estimated that total annual fish production is about 254 million metric tonnes in this area (Kopili-Kallang Basin Master Plan, Brahmaputra Board, 1995). The supplementary EIA report also mentions that indigenous lotic (fast-water) fish species are found along the Kopili River and its hilly tributaries.
41. As stated in the EIA, no fish or fishing activities were recorded in the main channel of the Kopili River. However, fish are present in the local streams, which support small-scale fisheries using traps and small gear. As per environmental monitoring reports, the pH of the water has increased (but it varies seasonally), but it is not clear whether the change in pH is due to an influx of floodwater or due to the mining ban in the upstream catchment of the river.
42. As per biodiversity study done in February 2021, the Aquatic Ecology in and around the proposed project and surrounding areas (river Kopili) has also been affected grievously by acid drainage due to illegal and uncontrolled rat hole mining upstream in State of Meghalaya. India's National Green

Tribunal (NGT) passed a directive in April 2014 to ban rat hole mining in Meghalaya leading to some improvement to the downstream aquatic ecology.

43. In the Zooplankton study a total of 12 species of zooplankton was reported. The dominant zooplankton across the study area was Rotifers, cladocera larvae & caddis fly larvae. The taxa observed across the study area were *Keratella tropica sp.*, *Lecane luna*, *Monostylla bulla sp.*, (Rotifers) and *Cyclops leuckartisp* (Cladocera), *Daphnia corinata*, & *Ceriodiaphnia cornusa*. Under the Ichthyofaunal study as reported in the WAPCOS report in 2015, 4 species of fishes namely *Garragotyla gotyla*, *Danio rerio*, *Puntius sophore* and *Barilius bendelisis* were caught inside the streams (small tributaries – not in the main channel) along the downstream influence zone (near Power House site and 4 km downstream of Power House site) while no fish were present or caught in the immediate vicinity of the proposed dam site. During the present study the presence of these fishes were also reported by local communities, and they informed that once the water is released from the upstream NEEPCO Hydroelectric project all fishes die and floats on water surface which may be attributed to the release of acidic water from the NEEPCO power project. Some fish fingerlings were also observed during the present study at the proposed Dam site.
44. As suggested in SEMR it is agreeable that to reduce pollution from the rat hole mines of the state of Meghalaya, the NGT ban and direction to be strictly implemented which could be a turning point to restore the water quality and improve the aquatic ecosystem of the Kopili river in near future.

6.4 WATER QUALITY RESTORATION

45. Draft EIA prepared by WAPCOS (October 2016) was finalized with 3 additional reports namely (i) Cumulative Impacts Assessment (CIA), (ii) an Integrated Water Resources Management Plan (IWRMP) and (iii) a Water Quality Restoration Plan (WQRP) including a mitigation strategy. The supplementary EIA (Volume 4) to the main EIA report is prepared mainly with an objective of Water Quality Restoration (WQR). The main objectives of the WQRP are to determine the sources of acidity due to Rat-hole mining and to identify and design remedial alternatives based on feasibility, cost, and relative effectiveness. As per this WQRP, the Kharkar river is the upstream source of the Acid Mine Drainage (AMD) due to rat hole coal mining practices. The Overall objective of the WQRP is:
- ✓ Reduce and eventually eliminate the AMD and consequent surface water contamination, up and downstream of Kharkar and Kopili river.
 - ✓ Remediate abandoned mine areas to isolate AMD-producing geologic material.
 - ✓ Restore coal mine affected land to eventually support pre-mine land eco-systems including its flora and fauna;
 - ✓ Restore pre-mining land use including agriculture, horticulture and grazing.
 - ✓ Restore riverine system to pre-AMD quality to support fisheries; and
 - ✓ Guide eventual land use and local economy away from coal mining, to one that promotes sustainable development.

46. AMD problem in the Kopili river Basin: Acid mine drainage (AMD) forms when sulphide minerals have been exposed to oxidising conditions during mining and other excavation activities, such as highway construction. In the presence of oxygen and water, sulphide minerals oxidise to form sulphate-rich and often metal-laden soil. AMD are toxic to vegetation and can reduce the potability of water supplies.
47. Water Quality in the Kopili River Basin: As per the EIA report (April 2018) for the LKHEP scheme, the Water quality in River Kopili has been reported as acidic (pH 3.3 to 5.2) making it unfit for drinking or usage in construction. Further samples were collected during January 17, indicates that Kharkar River, a tributary of Kopili actually carries exceptionally low pH (2.5-3.3) water leading to acidic nature in River Kopili. The supplementary EIA (Vol4: WQRP) reported that the AMD from the rat hole mining in Meghalaya is the major reason for such low pH value in Kharkar River; measures of AMD show pH value in the range of 2.2 to 3.7. In October 2017, MoEF&CC subcommittee reported that the pH value from river Kopili in the range 6.76-6.86 and at Umrang Reservoir in the range of 4.54-4.62. This report of MoEF&CC sub-committee therefore does not report high acidic water in River Kopili.
48. During the biodiversity study the in February 21, the pH has been reported in the range of 4.9 to 6.2.
49. CP-2 contractor has initiated water quality monitoring in Longku Nala and Kala Nala and both are having PH in the normal range. It is suggested to carry out the pH measurement in river Kopili at various upstream and downstream points so that a profile can be created to understand the improvement of deterioration of pH levels along with various safeguard measures. These details may be reported in the subsequent SEMRs

6.5 INSTITUTIONAL ARRANGEMENTS & CAPACITY BUILDING

50. Overall, no change in the institutional arrangements of EA was reported during the reporting period. It is observed that regular EHS trainings and fire safety mock drills are being conducted by the CP-2 as per following dates:
- ✓ Training on oil spill conducted on 15th June 2021---8 labours were trained
 - ✓ Waste Management and housekeeping conducted on 18th May 2021-----8 labours were trained
 - ✓ Health and Safety Team trained 25 to 30 staff and workers each month on Hazardous wastes and Food wastes.
 - ✓ Fire drill conducted on 25th May 2021---12 labourers were trained
 - ✓ Fire drill conducted on 5th June 2021----7 labours were trained
 - ✓ Front line supervisor EHS training done in every months of January to June 21 (refer table 9.B of SEMR)
 - ✓ L&T Life EHS risk management training in every month

- ✓ ATL EHS online safety training done in every month
- ✓ Work with electricity training done in every month
- ✓ Work with crane and lifting training done in every month
- ✓ Welding and gas cutting training done in every month
- ✓ Defensive driving training done in every month
- ✓ Training to workers for work at height done in every month
- ✓ No Fatal accident reported in the current reporting period
- ✓ In addition to this APGCL and PMC team have conducted on (i) Preparation of monthly Environment Report ; (ii) Training on environmental monitoring; (iii) Implementation of EMP; (iv) Preparation of monthly safety report; (v) Camp Behaviours; (vi) Implementation of EMP provisions between the period September to December 2020.
- ✓ It is also mentioned in SEMR that GRM training was given by APGCL's social expert and R&R NGOs at the affected villages.
- ✓ All staff and workers working at the site should be trained on Prevention of Sexual Harassment at work (POSH).
- ✓ All staff and workers working at the site are required to undergo social awareness training on local customs, culture, and heritage.
- ✓ HIV/AIDS awareness camp may be conducted by CP-2 and the same may be reported in the next SEMR
- ✓ Awareness training was given to the workers on monitoring of poaching activities
- ✓ In the SEMR it is mentioned that training has been given on awareness for the workers as a part of biodiversity conservation.
 - Tree cutting only in presence of Forest Department
 - Fire wood collection not allowed by the construction workers.
 - Smoking not allowed in the forest area and in construction area.
 - In any wild animals are sighted not to disturb them.
 - Hunting is prohibited.
 - Plantation of trees to be carried out.
- ✓ All staff and workers working at the site are required to undergo wildlife awareness training covering the protocols to be followed in the event of an encounter with a wild animal.
- ✓ The EHS training module for all package contractors must include incidents of snake and insect bites and train the required staff on how to tackle such medical emergencies.
- ✓ As part of the project, once EMC is deployed, they also need to provide necessary on the job training and conduct workshop on various subjects like dam safety, biodiversity, environmental aspects including occupational health and safety, sustainable development, biodiversity and wildlife management, water quality restoration etc.

6.6 SOLID & LIQUID WASTE MANAGEMENT

51. At present, solid waste management plan is under preparation and will be implemented soon. The updates will be captured in the next reporting period.

52. CP-2 contractor has placed colour coded bins at different sites. These details will be further checked during EMC visit in subsequent periods.

6.7 MUCK MANAGEMENT MEASURES:

53. As per the EIA 2018, it was projected that 0.985 million m³ of the total 1.407 million m³ of muck that needs to be handled will be disposed of at the two designated disposal sites located within the forest area. However, as per Forest Advisory Committee's (MoEF&CC) suggestion the miscellaneous area and Muck disposal site has been shifted from Forest Land to Revenue and Muck Disposal Plan has been approved. Slope compaction, tree plantation toward prevention of soil erosion in the disposal site is yet to started. This is crucial and should be initiated at the earliest.

54. CP-2 is yet to submit a muck disposal plan. Currently out of the 4 muck disposal sites identified, 2 are being used and reported in SEMR.

55. It is also reported in SEMR that muck from road works disposed downhill into forest trees and contractor has been asked to change the current practice. Report will be prepared on the number of additional tree/pole/saplings lost by project as a result of this muck disposal incident. Also requested the contractor to immediately replant the slope with grass to prevent soil erosion and replacement trees to compensate for numbers that were lost due to muck disposal. Update on corrective action (with photos) will be submitted in the next EMR.

7.0 CONCLUSION AND RECOMMENDATION:

56. Overall, the SEMR has truly addressed the statutory compliance status, ADB loan covenants and corrective measures proposed in the previous ADB mission.

57. Some of the findings that require compliance in the subsequent SEMRs include the following:

- ✓ Copy of the EIA need to be disclosed in the website of APGCL
- ✓ CTE for crusher and batching plant yet to be received from PCBA;
- ✓ Land hand over of Karbi Anglong forest land is awaited
- ✓ Mining permit awaited for 4.6 ha near kala nala for coarse aggregate from NCHAC
- ✓ NOC from Deputy Commissioner Govt of Assam, for setting up Fuel dispensing Unit is pending
- ✓ NOC from PESO is pending
- ✓ NOC for blasting operations is pending, application however submitted in May 2021.
- ✓ Crusher construction started before getting CTE by CP-2 contractor; should be avoided
- ✓ Batching plant construction started before getting CTE by CP-2 contractor; should be avoided
- ✓ Labour license taken up by CP-2 contractor is for 250 workers but there are possibility of involving more workers which should always be avoided. The same needs to be monitored

- regularly and EMC once deployed may be asked to check the same.
- ✓ NOC for the usage of surface water usage need to be obtained before the actual usage.
 - ✓ Drinking water test reports
 - ✓ Construction of treatment plant for the treatment of black and grey water generated from CP-2 contractors labour camps, kitchen and other arears. The treatment capacity could be 100 KLD STP.
 - ✓ A biodiversity monitoring committee needs to be formed, and requisite nomination may be obtained from concerned department.
 - ✓ Water quality samples may be collected from river Kopili and the same may be reported in the subsequent SEMRs
 - ✓ Solid Waste management plan may be prepared, and CP-2 should get it approved through APGCL before implementation
 - ✓ Similarly muck management plan is yet to be approved, and CP-2 should get it approved through APGCL before implementation
 - ✓ Training initiative taken by CP-2 are reported and total 344 trainings conducted which is a good approach but since more actions will come up in the next period, it is suggested to regularly continue these training along with regular tool box talks.
 - ✓ The EHS training module for all package contractors must include incidents of snake and insect bites and train the required staff on how to tackle such medical emergencies.
 - ✓ Camera trap survey and annual bird count to be initiated, details may be captured in the next reporting period.
 - ✓ The subsequent SEMR need to elaborate on the CATP, other GAP plantation, Pasture development, check dam construction, fish management plan, Integrated Water Resource Management Plan (IWRMP) etc.
 - ✓ In the SEMR it is mentioned that poaching activities monitored, and awareness carried out among the workers.
 - ✓ Labourers and other project site officials must also be provided with medicated mosquito nets for protection against malaria, dengue, and other vector-borne diseases.
 - ✓ The use of firewood for cooking should be stopped with immediate effect, and cooking gas should be provided in common kitchens.
 - ✓ Emergency contact information for First Aiders must be accessible to all and updated as needed.
 - ✓ A project awareness programme for HIV/AIDS, wildlife protection, wildlife-human conflict, general EHS requirements, community health safety, and grievance redressal needs to be planned and scheduled every quarter.
 - ✓ All contractors are required to prepare an incident or accident register record, and all incidents need to be reported in the monthly EHS report. Initiated.

 - ✓ CP-2 have initiated submission of Monthly Environment Report with monthly updates on the implementation status of environmental safeguard compliance. The status of EMP implementation may also be included.
 - ✓ Every month, a joint site inspection between the PMC and contractor's (all packages as relevant) representatives is to be made, after which the best solutions to address the inspection's results

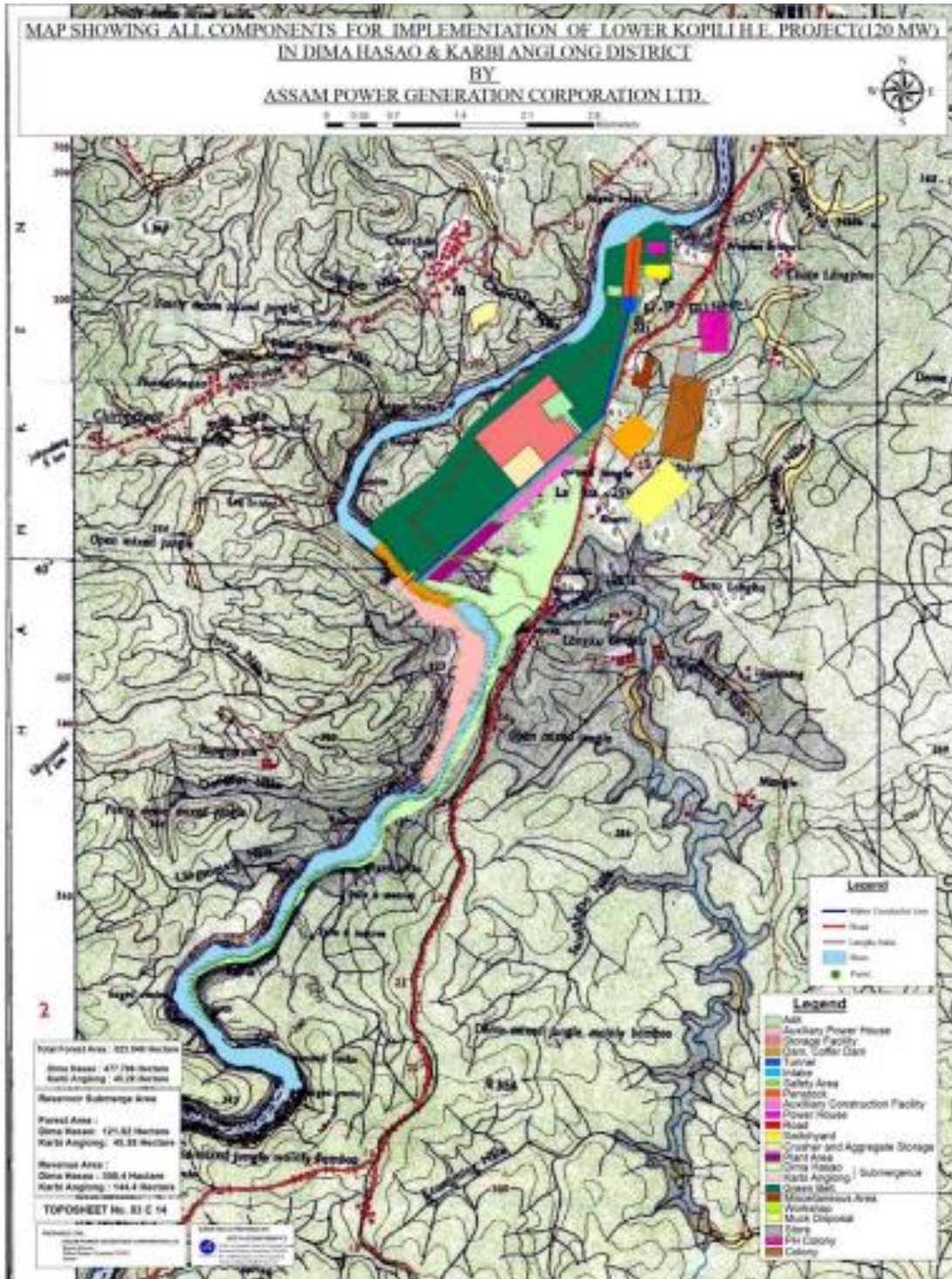
are to be decided and submitted as a Monthly Environmental Report along with a monthly EHS review report.

- ✓ All formal and informal complaints, requests, and grievances should be recorded, and adequate closure should be provided. Post-closure, the complainant should be adequately informed. Grievance register is now maintained.
- ✓ Ensure monthly consultation with the local community to record community concerns pertaining to environmental as well as EHS issues, if any. The outcome of the meetings should be recorded in the Monthly Environment Report (MER).
- ✓ GRC meetings should be held every quarter, involving local representatives. Suggestions from the meetings should be recorded in the SEMR.
- ✓ All contractors (currently only CP-2) are required to ensure that their staff and workers working at the site are trained on POSH at work.

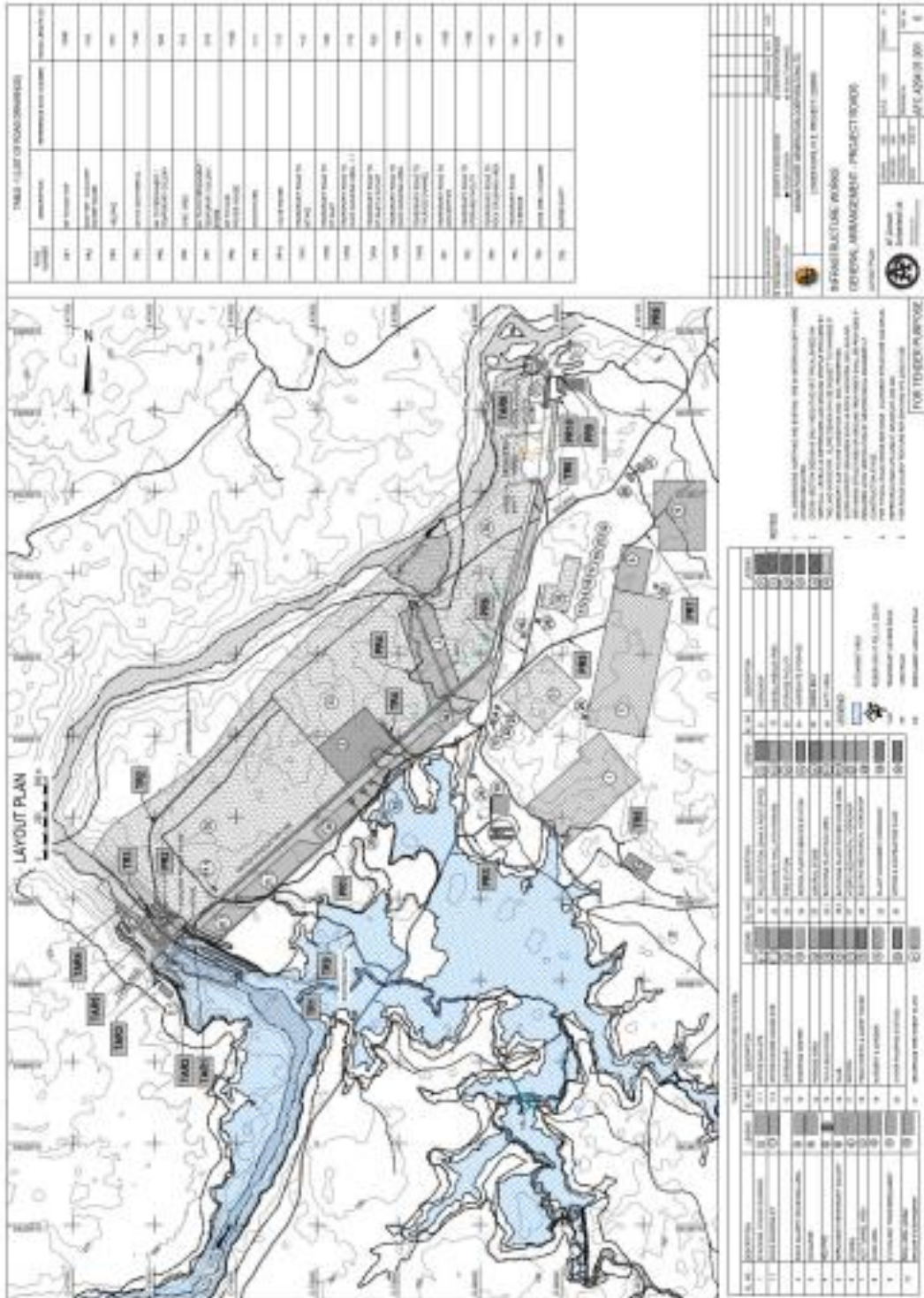
58. CP-2 should avoid disposing muck downhill into forest trees and contractor was asked to change this practice. A report to be prepared on the number of additional tree/pole/saplings lost by project as a result of this muck disposal incident. Also requested the contractor to immediately replant the slope up with grass to prevent soil erosion and replacement trees to compensate for numbers that were lost due to muck disposal. Update on corrective action (with photos) will be submitted in the next EMR.

59. Subject to these observations, the SEMR seems to have captured most of the information pertaining to environmental safeguards taken up for the period Jan-June 2021.

Annexure-I (Project Layout Map)



Annexure-II (Detailed Layout Plan)





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