

# **VOLUME – II OF III**

## **TECHNICAL SPECIFICATIONS**

### **SECTION – XIII UPDATED ENVIRONMENT MANAGEMENT PLAN (EMP)**



# Initial Environmental Examination

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Project Number: 54053-001

Original: September 2024

REVISED: August 2026

## **Nepal: South Asia Subregional Economic Cooperation Electricity Transmission and Distribution Strengthening Project**

### **IEE Addendum and Updated EMP for Bidding and Contract**

#### **Output 1(v) Dailekh – Kalikot – Jumla 132 kV Transmission Line and Substation**

Prepared by Nepal Electrical Authority, Government of Nepal, for the Asian Development Bank (ADB).



# Nepal: South Asia Subregional Economic Cooperation Electricity Transmission and Distribution Strengthening Project- **Output 1(v) Dailekh – Kalikot – Jumla 132 kV Transmission Line and Substation**

## I. Introduction

This IEE addendum includes updated to the IEE dated September 2024 for the proposed Dailekh – Kalikot – Jumla 132 kV Transmission Line and Substation component will be located in Dailekh, Kalikot and Jumla Districts of Karnali Province of Nepal. The transmission line will transverse Dungeshwor Rural Municipality, Narayan Municipality and Naumule Rural Municipality of Dailekh district; Tilagufa Municipality, Mahawai Rural Municipality of Kalikot district; and Hima Rural Municipality, Tila Rural Municipality, Tatopani Rural Municipality and Chandannath Municipality of Jumla district.

Further site visit Mission in May 2025 was conducted by the ADB TA Consultants (international and national along with NEA) and to update the due diligence, check site conditions and revisit impacts and risks and provide any update to the assessment, audit of the associated facility Dailekh ss on going works, and EMP by preparing an Addendum and updated EMP (this document).

## II. Description of the Sub-Project Scope

The total length of the transmission line from Dailekh Substation to Jumla Substation is 82.14 km long and number of transmission towers is 279 consisting of 277 angle towers or angle points (APs) and 2 Dead-End towers ranging from 30m to 40m in height. The minimum and maximum elevation of APs in the route is 503 m and 2,193 m, respectively. The minimum and maximum span in between APs are 18.5m and 489.4m, respectively. The right-of-way (ROW) required for the 82.14 km transmission line will be 18m, 9m either side, 147.85 hectares in total. Per the resettlement plan, the right of way will be requiring 104.12 hectares plus 7.05 hectares for the tower foundations (to be confirmed based on final resettlement plan).

The component includes construction of one new 132/33/11 kV GIS substation at Jumla, with total transformer capacity of 2X50 MVA. Land take for the substation is about 2.77 hectares.

Bay extension at the substation at Dailekh (associated facility) to accommodate the DKJTL is an associated facility of the transmission line on 2.18 ha of land. This 132/33 kV substation is already under construction by NEA as part of its 32 km Surkhet – Dailekh 132 kV transmission line project. The contract is awarded 2025 and as per the timelines of the contract, construction works will be completed within 2 years.

**Table 1: Summary of TL Component and Locations**

| Components                                                                        | Sub-Components                                                                     | Province | District | Municipality                  | Ward No         |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|----------|----------|-------------------------------|-----------------|
| Dailekh – Kalikot - Jumla 132 kV Double Circuit, Transmission Line and Substation | Construction of 82.14 km Transmission Line with 279 Towers (277 Angle, 2 Dead-End) | Karnali  | Dailekh  | Narayan Municipality          | 4,5,7,8,9,10,11 |
|                                                                                   |                                                                                    |          |          | Dungeshwor Rural Municipality | 1               |
|                                                                                   |                                                                                    |          |          | Naumule Rural Municipality    | 1,2,8           |
|                                                                                   |                                                                                    |          | Kalikot  | Tilagufa Municipality         | 1,3,4,9,11      |
|                                                                                   |                                                                                    |          |          | Mahawai Rural Municipality    | 2,3,4           |
|                                                                                   |                                                                                    |          | Jumla    | Hima Rural Municipality       | 6,7             |
|                                                                                   |                                                                                    |          |          | Tila Rural Municipality       | 1,2,3           |
|                                                                                   |                                                                                    |          |          | Tatopani Rural Municipality   | 1,2,3,6         |
|                                                                                   |                                                                                    |          |          | Chandanath Municipality       | 9               |
|                                                                                   | Construction of 1 new Substation in Jumla (2.77 hectares)                          |          | Jumla    | Chandanath Municipality       | 9               |

**Due Diligence/Audit of Associated Facility, Dailekh ss ongoing construction works.**

ADB SPS 2009 requires environmental assessment for projects to assess the impacts and risks in the context of the project's area of influence, which encompasses associated facilities, or facilities that are not funded as part of the project (funding may be provided separately by the borrower/client or by third parties), and whose viability and existence depend exclusively on the project and whose goods or services are essential for successful operation of the project. With this definition, the IEE study regards the Dailekh Substation as an associated facility relative to the Dailekh-Kalikot-Jumla component. In view of this, a due diligence was carried out for the substation as part of project preparation for ETDSP. The due diligence is based on the desk review of the national documentation prepared for the transmission line component, site visits, consultation and discussions with NEA staff.

**Table 2: Status comparison during draft IEE (Sept 2024) vs IEE updating (Feb 2026)**

|                  | IEE Sept 2024/due diligence                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | IEE Rev-1 Feb 2026/Addendum /Audit observations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Remarks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Scope/<br>Status | <p>The Dailekh 132 kV substation bay extension of the TL will be funded separately to the project. However, this substation works depend exclusively on the transmission lines that will be financed by ADB and vice versa. Therefore, per ADB's SPS definition, these substation works are considered as an associated facility of the project, which requires due diligence as part of the environmental assessment. For Dailekh 132 kV substation, land has been acquired and the boundary fence and gate house installed. Results of the due diligence reveal that the associated facility has been designed and is being implemented in compliance with the national laws and regulations. National IEE has been carried out for the Surkhet-Dailekh 132 kV transmission line project which it is at the end of, and it was approved by the government agency as required under Nepal's regulations. At this stage, no high-risk issue was noted, but substation will be required to follow the EMP to ensure that they achieve a safeguard outcome consistent with the rest of the DKJTL components.</p> <p>Results of the due diligence reveal that the associated facility have been or will be designed and implemented in compliance with the national policies and regulations for environmental, health and safety. At this stage, no high-risk environmental issue was noted. However, in consideration of the due diligence is done only within the period of this IEE study, and that the associated facility at</p> | <p>The SS is being implemented since the year 2024 construction work is ongoing. The SS site has compound wall constructed on three sides but one side towards the river has barbed wire fence and some sections have been damaged by local people for entrance to the site (although the boundary wall was recently constructed). The construction works of Control Building, Store Building was ongoing while ground works of staff quarter building was in progress (15% construction works of the substation complete as of May 22, 2025). The partially constructed control building with roof was being used as store for construction materials. For lighting purpose generator was being used. Major issues identified included Dust and Noise, muck and sediment on site, construction waste not managed. Personal Protective Equipment (PPE) not being used, no first aid box was on site, river water was being pumped and used for drinking, serious trip and fall hazard risk was observed, no separate toilets for female workers and camps included 15 workers using 4 rooms.</p> <p>Observations:</p> <ul style="list-style-type: none"> <li>• Under construction – about 15% complete</li> <li>• SS Staff quarter – 2 floor complete.</li> <li>• SS Control building is complete.</li> <li>• Switch yard/Gantry yet to start.</li> <li>• Evacuation Tower outside SS is completed</li> <li>• Dust and Noise - major issue, no control</li> <li>• Muck, sediment on site, construction wastes not managed; sediment run off</li> <li>• No first aid box and PPE</li> </ul> | <ul style="list-style-type: none"> <li>• EMP in the IEE needs to be implemented completely.</li> <li>• During the implementation of the EMP consultation needs to be carried out with relevant Locals consultations</li> <li>• Applicable Environment Related Laws of the country needs to be complied while implementing the works as an associated facility</li> <li>• Regular monitoring of the implementation of the EMP needs to be carried out and sent to relevant stakeholders.</li> <li>• Implement Minimization of Adverse Impact to the Environment and Enhance Positive Environmental Impact.</li> <li>• Supervision and monitoring lacking</li> </ul> |



|  | IEE Sept 2024/due diligence                                                                                                                                                                                                                                | IEE Rev-1 Feb 2026/Addendum /Audit observations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Remarks |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|  | <p>Dailekh substation is currently under construction, it is recommended that an environmental audit should be conducted upon loan effectiveness to monitor and evaluate the effectiveness of the implementation of the EMP so far with CAP if needed.</p> | <ul style="list-style-type: none"> <li>• Drinking water. – pumped from nearby river, no storage identified on site</li> <li>• Major trip and fall hazard, slip on muddy internal roads</li> <li>• No designated material storage area</li> <li>• No GRM details on site</li> <li>• The access road to the site is fair weather earthen road that needs upgradation to ensure easy access to the site -not strated</li> <li>• There is one <i>Bombax cieba</i> tree in the middle of the SS site and NEA has indicated that it will be retained -retained</li> <li>• One section of the SS boundary wall has an irrigation channel water flowing along the boundary wall to an agricultural tunnel system outside the boundary wall. Some parts of the inner wall section has gully hence adequate drainage intervention may need to be considered to ensure no damage to the wall. On some sections towards the other end the slope stability may need to be ensured.</li> <li>• The guard room with water tanks were observed with gates closed.</li> <li>• There is river at 40m distance from the SS site.</li> <li>• The closest house is mentioned to be a temporary residence which will abandoned soon since the owner has another home in the town of Surkhet.</li> </ul> <p><b>Key Compliance Gaps</b></p> <ul style="list-style-type: none"> <li>• Lack of structured waste management and hazardous material handling.</li> </ul> |         |

|            | IEE Sept 2024/due diligence                                                                             | IEE Rev-1 Feb 2026/Addendum /Audit observations                                                                                                                                                                                                                                                                  | Remarks |
|------------|---------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|            |                                                                                                         | <ul style="list-style-type: none"> <li>Absence of emergency drills and incomplete staff training.</li> <li>Inadequate irrigation solutions causing community grievances.</li> <li>No monitoring of air and water quality was not observed</li> <li>Occupational H&amp;S issues observed -no PPE, etc.</li> </ul> |         |
| Photograph |  <p>September 2024</p> |                                                                                                                                                                                                                               |         |

|  | IEE Sept 2024/due diligence | IEE Rev-1 Feb 2026/Addendum /Audit observations                                                                                                                                                 | Remarks |
|--|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|  |                             | <div><p>May 2025</p></div> |         |

## **New Transmission Line and New Jumla Substations status:**

- IEE report approved by MoEWRI and also the construction license
- Land acquisition: 27 land parcel pending acquisition.
- Cadastral map being updated for land acquisition; some house enumeration pending due to monsoon
- Jumla Substation is accessible through a Municipal Road which is being constructed by the Chandannath Municipality.
- Tree enumeration in Kalikot and Jumla has been completed, while it is ongoing in Dailekh District.
- Bidding status- bid floated for TL on 29.06.2026, and the initial EMP was uploaded.
- Kalikot SS not in scope
- All statutory requirements/tree count as per EMP to be completed before Contract award



# DOCUMENTS FOR BID DOCUMENTS AND CONTRACT



# Initial Environmental Examination

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**DRAFT**

Original: September 2024

Revised: August 2026

## NEP: South Asia Subregional Economic Cooperation Electricity Transmission and Distribution Strengthening Project

Main Report (Volume 1, Part 1B)- UPDATED EMP

### **Output 1(v) Dailekh – Kalikot – Jumla 132 kV Transmission Line and Substation**

Prepared by Nepal Electricity Authority, Government of Nepal for the Asian Development Bank.



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## **A. EPC Contractors - Roles and Responsibility**

### **General**

1. Through the contract, NEA will delegate responsibility for implementing all relevant measures during design, pre-construction, and construction to contractor for the duration of their contract.
2. The EPC Contractors will be required to comply with the EMP during the design, preconstruction, and construction phases, closely supervised and monitored by NEA.
3. The EPC Contractor will be responsible for reporting environmental safeguards progress and performance at least monthly to NEA including record data required by the EMoP and providing necessary inputs to the quarterly progress reports and semi-annual EMRs for the duration of their contract.
4. The requirement to undertake relevant mitigation and monitoring actions as set out in this EMP applies to the construction site as well as any temporary workers camps or overnight accommodation provided by them.
5. The EPC Contractor has the responsibility for EMP implementation of the contract. However, the EPC Contractor is required to ensure that the EMP requirements are cascaded down to all sub-contractors undertaking works, regardless they are formally or informally employed, and to be responsible for supervising and monitoring their sub-contractors in turn. Construction workers will need to abide, in their behavior and work, to directives issued by their employer with regards to environmental, health and safety management.
6. The EPC Contractor will be responsible for the preparation of their CSEMP. The CSEMP will need to be fully compliant with the project-level EMP and the IEE and will need to be prepared within 30 days of Contract award and got approved 30 days prior to access to the site including for site establishment, preparation and clearance.

### **Specific Responsibilities**

In addition to the above, the EPC Contractor will be responsible for:

- Implementing all measures and responsibilities allocated to the EPC Contractor under the EMP for the full duration of the contractor's involvement.
- Ensuring adherence to all applicable national and provincial environment, health, safety, and labor laws and regulations in force at the time.
- Ensuring adherence to ADB's Safeguard Policy Statement (2009) and the related IFC Environment, Health and Safety (EHS) general and power transmission and distribution guidelines (2007) as well as ILO's Safety and Health in Construction and worker accommodation guidelines.
- Ensuring the detailed design reflects the EMP requirements; seeking to ensure it has the same or no worse impact than the indicative designs which were assessed in the IEE.
- Supporting NEA to update (as required) the IEE in respect of the detailed design by providing sufficient details to inform a revised project description and any subsequent reassessment of impacts and risks.
- Undertaking and documenting a facilitated health and safety (H&S) risk assessment considering for all phases.
- Preparing a CSEMP and sub-plans as specified in the definitive/disclosed IEE/EMP for review and approval by NEA prior to the commencement of works including site establishment.
- Ensuring adequate budget, staff and other resources are allocated to comply with and implement the contractor's responsibilities under the EMP and to supervise and monitor the active construction site to protect the environment and ensure the health and safety of all workers and affected communities.
- Ensuring suitably qualified and experienced environment, health and safety safeguard officers, as per the EMP requirements have been appointed to undertake regular on-site supervision and monitoring activities before the commencement of works.

- Adopting a zero-tolerance approach to OHS on the project, enforce all workers to comply with the OHS requirements of the EMP including the wearing of appropriate PPE on the construction site.
- Obtaining all necessary permissions before the commencement of related work, share copies of all clearances, permits, licenses, and insurances obtained.
- Providing – in part with the support from NEA – and ensuring attendance at EHS trainings for formal and informal construction workers and other personnel as required.
- Ensuring that all construction workers including all formal and informal employees and subcontractors understand their responsibilities to implement the EMP and mitigate environmental impacts and risks associated with pre-construction and construction activities.
- Supporting NEA in undertaking ongoing consultation and implementing the site-level GRM (attached to this document); in particular, the contractor's GRM Focal shall thoroughly document details of complaints and make its best efforts to resolve the complaints at project site level; all this information is to be included in the contractor's monthly reports to NEA.
- Undertaking environmental monitoring as set out in the EMoP during pre-construction and construction and documenting qualitative and quantitative monitoring results; for quantitative monitoring the contractor is to hire accredited, and quality assured, third party laboratories.
- Submitting monthly environmental management reports to NEA (monthly EMP reports will be stand-alone but included as part of the contractors' monthly progress reports) relating to the work undertaken over the reporting period and documenting the environmental measures including monitoring activities that have been carried out, problems encountered, record data including near misses and accidents, grievances received, and follow-up actions that were taken (or will be taken) to correct the problems.
- Informing NEA immediately in case of any approved detailed design changes or unanticipated environmental impacts occurring during implementation, and as required, provide any information needed to NEA to enable them to promptly update the IEE/EMP for clearance by ADB before any changes are implemented.
- Informing NEA within 24 hours in case of chance find or accident on site and providing within 48 hours an incident report with corrective action detailing how reoccurrence will be prevented.
- Informing NEA immediately in case of any non-compliance and help them to prepare as necessary a corrective action plan for clearance by ADB, the contractor is required to implement all necessary corrective action requested by NEA to ensure the project remains in compliance with national and state regulatory requirements, ADB's SPS 2009, the project's loan covenants and EMP requirements.

### **EPC Contractor Reporting**

- The EPC Contractor will establish their own internal systems for monitoring and reporting their EMP implementation.
- The EPC Contractor will formally submit monthly summary environmental management reports per an agreed template to the PMU/PMD.
- Complete photographic records will be kept by the contractor covering all activities on site as well as key locations such as the construction site, receptors adjacent, workshops, stores, sanitation and welfare facilities, temporary worker camps or overnight accommodation etc. Photographs of key areas will be taken prior to construction activities beginning to provide the environmental baseline. Copies of all geo-referenced photographs will be submitted to the PMU along with the contractor's monthly report.
- Specifically, the EPC Contractor will be responsible for the following documents and reports:

### EPC Contractor Reporting Responsibilities

| Documents                                                                               | Responsible Person | Destination of the documents | Submission timing                            |                                                                        |
|-----------------------------------------------------------------------------------------|--------------------|------------------------------|----------------------------------------------|------------------------------------------------------------------------|
|                                                                                         |                    |                              | Design period                                | Construction period                                                    |
| Health and Safety Risk Assessment                                                       | HSS                | PISC, PMU                    | X                                            | X (updated prior to start of works and then at least annually updated) |
| Detailed design for approval                                                            | ESM                | PISC, PMU                    | X (Once, prior to the start of construction) |                                                                        |
| CESMP for approval including all required subplans (see tables)                         |                    | PISC, PMU                    | X (Once, prior to the start of construction) | X (updated through construction as needed)                             |
| Environmental, health and safety checklists                                             |                    | PISC, PMU                    |                                              | X (every week, to be completed daily)                                  |
| Monthly environmental management reports including monitoring records and data per EMoP |                    | PISC, PMU                    | X (every month)                              | X (every month)                                                        |

### **Control of Records**

The list of records that must be available by the EPC Contractor for review must include:

- Definitive IEE and EMP (as disclosed on the ADB website)
- Legal register (of applicable national and state legislation)
- Environment, health and safety (labor) permits and licenses
- Contractor's certifications and insurances
- Tree felling permits, vehicle emission test certificates etc.
- Training plan and training records (including inductions)
- Community liaison plan, community awareness documentation and records of all consultations undertaken
- Records of emergency preparedness and response drills
- Document review and approval records
- Contractor's CSEMP and sub-plans and copies of approval records
- Completed site checklists and photographic records
- Copies of correspondence related to environmental, health and safety issues
- Corrective and preventive action request records
- H&S Risk Assessment
- Incident record and incident reports
- GRM register
- Work program and schedule
- List of equipment and maintenance log
- Route/program of construction material transportation
- Records of maintenance and cleaning schedules for sediment and oil/grease traps
- Records of quantity of discharged wastewater and concentration of pollutants
- Waste disposal records and waste transfer notes including waste disposal sites and instructions for waste transportation
- Log of material inventories and consumption
- Chance find records (if any)

- Staff contracts, timesheets and pay slips
- Construction camp site/overnight accommodation reports
- Water quality sampling results
- Air quality and noise test results
- EMF measurement results
- Property surveys
- Pre-construction biodiversity surveys [habitat surveys and tree inventory]

These records shall be kept on-site by the EPC Contractors ESM and available for inspection at any time

### **EPC Contractors Staff**

- To prepare and implement the CSEMP and to supervise and monitor the EMP/CSEMP implementation for the substation expansion components a team of specialists will be required as part of the contractor's team as illustrated in the following figure and described in detail below.
- If a contractor is awarded more than one contract package/lot then entirely separate EHS team is to be employed for each of them.
- There will also be a need for the contract to employ ad-hoc specialist inputs to deliver specific EMP tasks that are assigned to them where a dedicated staff is not employed e.g., archaeologist in relation to physical cultural resources, ecologist for checking of any trees to be cut.
- All subcontractors will be required to appoint an EHS representative to be available on each work site.
- Use of day labor is to be discouraged, if day labor is used the contractor will have to ensure increased supervision on-site from their side due to increased risks from lack of health and safety awareness etc.

### **EPC Contractors Environmental, Social, Health and Safety Team**



### **Environmental and Social Manager**

- During construction, the EPC Contractor must retain the expertise of an Environmental and Social Manager (ESM) to implement and continually update the CSEMP and to oversee and report on the operation of the EMP/CSEMP throughout the contract period.
- The ESM will be the EPC Contractors main focal point for all environmental, social, health and safety issues associated with the project components and will lead the other team members listed below.
- The ESM will be a suitably qualified and experienced full-time member of staff on the EPC Contractor's roster and should be on site at least five days per week.

- The required qualifications of the ESM are as follows:
  - Degree in environmental sciences, environmental management or related field.
  - At least 10-12 years' experience in on-site environment, health and safety supervision and monitoring.
  - Experience of at least five construction projects of a similar type, location, size and scale.
  - Experience of construction projects receiving IFI funding whilst being conversant with national laws and regulations and IFI environment safeguard policies and requirements.
- Specifically, in overseeing EMP implementation the ESM shall be responsible for:
  - In relation to new sites (SS and TL) identifying any areas of ecological sensitivity that need to be avoided with support of field ecologist and botanists; and areas of physical cultural resource sensitivity that may need to be avoided with support of physical cultural resources expert.
  - Responsible for ensuring ad-hoc specialist inputs (e.g., ecologist, competent asbestos surveyor) are employed to support detailed design and construction.
  - Incorporate mitigation requirements written in the EMP in preparing the CEMP and its subplans.
  - Translate mitigation requirements written in the CSEMP and its sub-plans into practical measures on the ground.
  - Ensure that all staff are fully aware of the environmental sensitivities of the site and their responsibilities, as outlined in the management plans (e.g., via practical toolbox talks ahead of the construction).
  - Retain records and take field notes and photographs to demonstrate compliance with the EMP/CSEMP.
  - Organize regular consultations including formal monthly community meetings and informal weekly discussions with adjacent villages to keep them informed of progress e.g., construction schedule and changes in the schedule and to receive feedback from the community on any related environmental and social issues.
- The ESM shall also manage all social and labor related issues.
- The contractor's ESM will act as their GRM focal to keep affected persons informed of works and be available to receive and deal with any grievances at the project site level. They will work with the labor specialist as GRM focal for labor.
- In addition, the ESM will be responsible for the preparation of weekly environmental checklists and an environmental section of the EPC Contractor's monthly progress reports that shall be submitted to the PISC and PMU for review. The PISC shall provide a template of the checklist to the EPC Contractor.
- The monthly reports, which will include the weekly environmental checklists, shall contain sections relating to:
  - General progress of the contract and key construction works undertaken or milestones met.
  - Records of and data from environmental monitoring.
  - Environmental incidents, e.g., spills of liquids, fatalities, etc.
  - Progress of any environmental initiatives, e.g., energy savings, recycling, etc.
  - Conclusions and recommendations (corrective action plan).
- The ESM shall provide daily toolbox training at the construction sites as well as monthly toolbox training with the labor officer on code of conduct, sanitation and welfare at the construction camp site/overnight accommodation. The ESM shall keep a record of all monthly training and toolbox training undertaken.

### **Health and Safety Specialist**

- The EPC Contractor shall also have a full-time suitably qualified and experienced Health and Safety Specialist (HSS) on the EPC Contractor's roster for the duration of their contract period, on site at least 5 days per week.
- If the contractor works more than five days per week, or more than one shift, during days or hours off, an alternate suitably qualified staff having NEBOSH/IOSH certification will be required to stand in.
- The HSS shall have at least 10-12 years of on-site experience supervising at least five projects of similar type, location, scale and size electrical infrastructure with relevant degree and NEBOSH/IOSH certification or similar qualification. They will need experience of construction projects receiving IFI funding whilst being conversant with national laws and regulations and IFI environment safeguard policies and requirements. The HSS shall report directly to the ESM.
- The main responsibilities of the HSS will be:
  - Provide H&S training, including daily toolbox training sessions at each active worksite.
  - Provide inputs to the CSEMP and approve H&S risk assessments and plans for specific work activities.
  - Conduct routine site inspections, weekly checklists, and issue internal stop notices, if necessary, for unsafe activities.
  - Maintain H&S statistics log for near misses, as well as incidents.
  - Provide H&S input to EPC Contractor progress and monitoring reports.

### **Pollution Control Specialist (New Substation)**

- The pollution control specialist will be a part time position to provide technical environment expertise to support detailed design and CSEMP preparation, particularly in respect of ensuring good international industry practice is incorporated into the design of oil bunds, storage areas, drainage, SF6 insulated equipment etc. They will have at least 10-12 years of pollution control management expertise including in design of oil bunds with a degree in environmental science or related field.

### **Labor Specialist**

- The EPC Contractor shall also have a part-time suitably qualified and experienced Labor Specialist on the EPC Contractor's roster for the duration of their contract period, present on each site at least once per month.
- They will have at least 5-6 years of labor management expertise including on construction sites with a degree in social science or related field.
- They will need experience of construction projects receiving IFI funding whilst being conversant with national laws and regulations and IFI environment safeguard policies and requirements.
- They will act as the GRM focal for workers at the construction site/construction camp site/overnight accommodation.
- They will be responsible for organizing regular consultations including formal and informal meetings and with the workers, conducting weekly checks of labor, sanitation and welfare facilities, audits of construction camp site/overnight accommodation, ensuring staff receive trainings for their role, establishing a system for and checking all workers have valid ID cards to access site, ensuring necessary labor paperwork, work permits and insurances are maintained, ensuring records of trainings, work permits, insurances, timesheets and pay slips are maintained and liaising with the HSS and site staff to ensure timely corrective actions where needed.
- The labor specialist will prepare the labor management plan and manage all labor related issues in coordination with the ESM and HSS.
- They will provide labor input to the EPC Contractor progress and monitoring reports.

**Botanist (all new sites in forest land, National Park buffer zone)**

- For any works in government forest land or the National Park buffer zone as detailed in the IEE, or otherwise passing through forest or densely vegetated habitat, the EPC Contractors shall engage a Botanist pre-construction and for the period of vegetation clearance being undertaken in these areas (part-time basis).
- The Botanist will have a degree in botany or similar, and at least ten years' experience of biodiversity surveys (flora) and supervision of similar projects in critical/natural habitat and forest area/habitat in Nepal.
- The specialist will report directly to the ESM and will be responsible for the following:
  - Pre-clearance and post-construction surveys
  - Oversight of land clearing activities, removal of vegetation

**Ecologist (all new sites)**

- EPC Contractors shall engage an Ecologist for the duration of the construction phase for transmission lines and on a part time basis for the SS site works.
- The Ecologist will have a degree in ecology or similar, and at least ten years' experience of biodiversity surveys (flora and fauna) ideally with botany experience and supervision of similar projects in critical/natural habitat and forest area/habitat in Nepal.
- The specialist will report directly to the ESM and will be responsible for the following:
  - Pre-clearance and post-construction surveys (with expert field ecologist support)
  - Oversight of land clearing activities, removal of vegetation and earthworks to ensure fauna are not disturbed (the ecologist must be on site full time during site establishment, clearance and vegetation removal).
  - Provide inputs to CSEMP e.g. developing wildlife encounter protocol, implementation of ecological aspects of the EMP, trainings and awareness raising activities and input to the EPC contractors progress and monitoring reports with photographic records kept.

**Environment, Health and Safety Supervisors**

- The HSS will be supported at each site by at least full-time, dedicated, on-site Environment, Health and Safety Supervisor for each site.
- They will also provide support to the ESM on environment. Each individual site will have adequate supervision in order to ensure the health and safety of all workers and local communities.
- If there are multiple subcontractors or workers on a single site each EHS Supervisor will be supported by a full-time, dedicated, on-site Health and Safety steward(s) with at least one to each subcontractor or 50 persons.
- The supervisors will require 5-6 years of supervision experience, a relevant degree, and NEBOSH/IOSH certification or equivalent.

**Management Systems**

- EPC Contractors will have a corporate EHS policy and environmental management certifications preferably such as ISO 14001 (or equivalent) and EHS certification such as OHSAS 18001 or equivalent.

## Appendix 1: Environmental Mitigation Plan



**Table A1-1: Environmental Mitigation Plan for Construction of Transmission Line (TL) and New Jumla Substation (SS)**

| Activity/Sub-component             | Issues/Impacts & Risks                                                                | Mitigation measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Applicable Project Standards / Guidelines                                                                                                                                                                                                                  | Implementation Responsibility (Budget Source and Timing)                                                                              | Monitoring Responsibility |
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| <b>Detailed Design Phase</b>       |                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                            |                                                                                                                                       |                           |
| Associated facilities (Dailekh SS) | The construction and operation of the associated facility will have an adverse impact | <ul style="list-style-type: none"> <li>Dailekh substation will be required to follow this approved IEE/EMP including mitigation and monitoring measures to ensure that they achieve a safeguard outcome consistent with the rest of the DKJTL components</li> <li>Report approved IEE/EMP implementation for associated facilities as part of EMR</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> </ul>                                                                                                                                                                                           | NEA<br>NEA Associated Costs<br>During installation and operation of the associated substation (immediate)                             | NEA PMU / PISC            |
| TL and SS                          | Siting and design of Project infrastructure not in compliance with EHS regulations    | <ul style="list-style-type: none"> <li>Design and layouts to reflect the requirements of the EMP and international engineering best practices/good EHS practice, as well as the issues raised by the public and other stakeholders as documented in the consultation chapter of the IEE report</li> <li>Comply with all applicable national and state environment, health, and safety (EHS) regulatory requirements in addition to the mitigation measures set out in the EMP – if there is any conflict between national requirements and measures set out in the EMP the most stringent provisions will take precedence</li> <li>For all construction works undertake facilitated H&amp;S risk assessment through a workshop during the design (and at other key stages) so it can inform both design and pre-construction preparations, considering both occupational and community H&amp;S risks resulting from subsequent stages of the project.</li> <li>Facilitated workshop will involve the design and construction team of the contractors and NEA operational staff.</li> </ul> | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>IFC EHS General Guidelines</li> <li>IFC EHS Electric Power T&amp;D Guidelines</li> <li>ILO Worker Accommodation<sup>1</sup></li> <li>GoN laws and regulations (Chapter 2 of IEE)</li> </ul> | EPC Contractor<br><br>Include in EPC contract cost<br><br>Before design approval for further implementation during construction phase | NEA PMU / PISC            |
|                                    | Finalization of design and layout                                                     | <ul style="list-style-type: none"> <li>Ecologist to undertake a habitat survey and tree inventory per the EMoP checking against the findings of the IEE</li> <li>Cut and fill requirements shall be minimized by design to reduce changes in topography and the extent of earthworks and thus dust generation during construction. Contractor shall quantify the</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>IFC EHS General Guidelines</li> <li>IFC EHS Electric Power T&amp;D Guidelines</li> </ul>                                                                                                    | EPC Contractor<br><br>Include in EPC contract cost                                                                                    | NEA PMU / PISC            |

<sup>1</sup><https://www.ilo.org/media/340691/download>

| Activity/Sub-component | Issues/ Impacts & Risks                        | Mitigation measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Applicable Project Standards / Guidelines                                                                                                                                                                                                                  | Implementation Responsibility (Budget Source and Timing)                                                                                     | Monitoring Responsibility |
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|                        |                                                | <p>extent of earthworks required and locations for disposal of excavated spoil such as through landscaping within SS site.</p> <ul style="list-style-type: none"> <li>Quantify the extent of earthworks required and locations for disposal of excavated spoil such as through landscaping on site. Landscaping must ensure the resulting slope design/topography does not exacerbate soil erosion.</li> <li>No new permanent access roads will be constructed except to SS sites if needed. Access roads will be graded and sloped with drainage either side to prevent unnecessary flow of water across the road and minimize soil erosion.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <ul style="list-style-type: none"> <li>ILO Worker Accommodation<sup>2</sup></li> <li>GoN laws and regulations (Chapter 2 of IEE)</li> </ul>                                                                                                                | Before design approval for further implementation during construction phase                                                                  |                           |
|                        | TL Finalization of design and route alignments | <ul style="list-style-type: none"> <li>In undertaking design, contractor with NEA to consult with communities in 500m to get their views and input into the route alignment (records of consultations are to be kept)</li> <li>Ensure conductors and/or jumpers are fitted with “bird sensitive” design measures e.g. adequate separation between live and ground or and insulation.</li> <li>No towers will be located within rivers or their floodplain</li> <li>For cutting of trees compensation planting will ensure no net loss of biodiversity in addition to meeting the national requirements; this requires forest habitat quality surveys to be completed to calculate the required offset</li> <li>Horizontal and vertical electrical clearances, as required by the Nepal Electricity Act, Rules and Regulations, are to be maintained to ensure safety of human beings and buildings in the vicinity of the distribution lines. If safety distances are found not to be complied with the TL will have a minor realignment to facilitate compliance, or the resettlement requirements will be triggered. No houses or other regularly occupied properties must be sited under the TL.</li> <li>No school compounds, playgrounds or similar facilities shall be crossed</li> <li>River/stream crossings required will be single span.</li> </ul> | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>IFC EHS General Guidelines</li> <li>IFC EHS Electric Power T&amp;D Guidelines</li> <li>ILO Worker Accommodation<sup>3</sup></li> <li>GoN laws and regulations (Chapter 2 of IEE)</li> </ul> | <p>EPC Contractor</p> <p>Include in EPC contract cost</p> <p>Before design approval for further implementation during construction phase</p> | NEA PMU / PISC            |

<sup>2</sup><https://www.ilo.org/media/340691/download>

<sup>3</sup><https://www.ilo.org/media/340691/download>

| Activity/Sub-component | Issues/ Impacts & Risks                                   | Mitigation measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Applicable Project Standards / Guidelines                                                                                                                                                                                                                  | Implementation Responsibility (Budget Source and Timing)                                                                                     | Monitoring Responsibility |
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|                        |                                                           | <ul style="list-style-type: none"> <li>Minimize visual impact through sensitive route alignment of overhead lines and tower placement having cognizance of any above ground physical cultural resources adjacent. Communities to be consulted on their views about TL in the area.</li> <li>Barbed wire type anti-climbing device shall be provided and installed for all tower structures. The height of the anticlimbing device shall be approximately 3 m above ground level</li> <li>Ensure that ICNRP community EMF exposure levels (reference and peak values) will be achieved</li> <li>All transmission towers will feature written and visual warning signs that meet the IEEE standards to include the ISO 7010 "Hazard Type: Electrical Symbol" warning of the risk of electrocution</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                            |                                                                                                                                              |                           |
|                        | New Jumla SS Finalization of substation design and layout | <ul style="list-style-type: none"> <li>Design to minimize visual impact and clutter.</li> <li>Utilize landscape screening to screen the boundary wall and fences; these will need to be set back from the actual boundary to accommodate space for the vegetation.</li> <li>In undertaking design, contractor with NEA to consult with communities in 500m of the site boundaries to get their views and input into the site layout (records of consultations are to be kept)</li> <li>Designs will keep new impermeable surfaces to a minimum.</li> <li>Cable trenches will be kept fully covered at all times to prevent H&amp;S incident or small wildlife falling into them.</li> <li>Design to provide spill prevention kits (sorbent pads, loose sorbent material, etc.) at storage areas and other at-risk locations within clearly labelled containers.</li> <li>Locate new transformers; storage areas; and septic tanks/soak away at least 50m from waterbodies and borewells to reduce pollution risk, if closer proximity is required due to site layout further assessment to be carried out to demonstrate using a source-pathway-receptor model there will be no adverse impact on aquatic ecology or human health.</li> </ul> | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>IFC EHS General Guidelines</li> <li>IFC EHS Electric Power T&amp;D Guidelines</li> <li>ILO Worker Accommodation<sup>4</sup></li> <li>GoN laws and regulations (Chapter 2 of IEE)</li> </ul> | <p>EPC Contractor</p> <p>Include in EPC contract cost</p> <p>Before design approval for further implementation during construction phase</p> | NEA PMU / PISC            |

<sup>4</sup><https://www.ilo.org/media/340691/download>

| Activity/Sub-component | Issues/ Impacts & Risks | Mitigation measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Applicable Project Standards / Guidelines | Implementation Responsibility (Budget Source and Timing) | Monitoring Responsibility |
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|                        |                         | <ul style="list-style-type: none"> <li>Septic tanks/soak aways will be placed away from drainage routes, waterlogged areas and shallow groundwater.</li> <li>Internal access roads to be surfaced with asphalt or concrete.</li> <li>Comply with Labour Accommodation Requirements appended to the IEE</li> <li>For control buildings and other internal workspaces provide adequate natural and/or artificial lighting levels to meet the IFC EHS Guidelines on Occupational H&amp;S (Table 2.3.3. Minimum Limits for Workplace Illumination Intensity) and take a life-cycle approach to detailed design, considering the use of construction materials and the energy and water efficiency of the building during operation adopting the “green building” concept e.g., using natural ventilation for reducing the need for air conditioners. Exhaust fans to be provided in kitchens and toilets. Detailed design is to include rainwater harvesting and enable NEA to readily fit solar panels on building rooftop once operational. If solar panels are included in the scope they must not contain hazardous materials e.g., cadmium, lead, or selenium. Equipment purchased for use on the project is to be accompanied by letter from the manufacturer stating its composition and the leaching potential of any heavy metal content to determine if it is acceptable and how it is to be disposed on at end-of-life. Solar panels to have an anti-reflective coating to minimize glint and glare and maximize light absorption, racking to be anti-reflective.</li> <li>Control building and other internal workspaces design will provide for sanitation and welfare facilities as per national regulations and international GIIP including indoor toilets with hand washing facilities (minimum of 1 unit to 6 males and 1 unit for 6 females shall be provided, it should not be necessary to go outside to use the toilets) connected to septic tank/soakaway and a dedicated cooking area with provision for non-wood cooking / clean eating area / rest area / segregated sleeping area for staff on-site etc. ILO worker accommodation guidelines to be followed - see annex on permanent accommodation provisions.</li> </ul> |                                           |                                                          |                           |

| Activity/Sub-component | Issues/ Impacts & Risks | Mitigation measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Applicable Project Standards / Guidelines                                                            | Implementation Responsibility (Budget Source and Timing) | Monitoring Responsibility |
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|                        |                         | <ul style="list-style-type: none"> <li>Dedicated shelter to be provided at the site entrance for use by security guards, shielding them from rain, wind, and extreme (hot / cold) temperatures. Separate accommodation will be provided for security guards on break.</li> <li>All wastewater to be connected to existing sewerage system or septic tank with soak away so no untreated wastewater will be disposed of to surface water or ground in operation, septic tank/soakaway effluent to meet national general wastewater standards or IFC wastewater discharge limits, whatever is the most stringent.</li> <li>Use of pit latrines and disposal of untreated sanitary wastewater is prohibited.</li> <li>Design to ensure all lighting is of energy efficient LED type with solar powered LED lighting where practical Use of fluorescent/HPSV lamps will be avoided since they are less energy efficient/classed as hazardous waste for purposes of disposal.</li> <li>Minimal outdoor lighting for H&amp;S purposes to be installed to minimize disturbance to nocturnal wildlife. Outdoor lighting to be installed must be of low intensity with little or no blue wavelength and operated using passive infrared (PIR) technology movement sensors set at person height so as not to be kept permanently on overnight, it must be directional and shielded, so light does not fall outside substation boundaries. If lit externally buildings will be designed with non-reflective dark colored cladding materials to avoid reflecting light.</li> <li>Ensure conductors and/or jumpers are fitted with "bird sensitive" design measures e.g. adequate separation between live and ground or and insulation.</li> <li>For cutting of trees compensation planting will ensure no net loss of biodiversity in addition to meeting the national requirements</li> </ul> |                                                                                                      |                                                          |                           |
|                        | SS Water supply         | <ul style="list-style-type: none"> <li>Potable water will be supplied that meets national drinking water standards (full suite) as part of the design.</li> <li>For on-site sources proposed undertake baseline water quality sampling per the EMoP to confirm suitability and as necessary</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>IFC EHS General Guidelines</li> </ul> | EPC Contractor<br><br>Include in EPC contract cost       | NEA PMU / PISC            |

| Activity/Sub-component | Issues/ Impacts & Risks | Mitigation measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Applicable Project Standards / Guidelines                                                                                                                 | Implementation Responsibility (Budget Source and Timing)                                                           | Monitoring Responsibility |
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|                        |                         | <p>design is to include additional water treatment, purification and storage facilities to facilitate safe drinking water supply.</p> <ul style="list-style-type: none"> <li>Where a new drinking water supply for operation is required or additional water will be taken from an existing source the location, depth and other details of borewell to be informed by a detailed hydrogeological study also describing the availability of water taking into account climate change, mapping existing groundwater users, the current water abstraction rates and the additional volume of water required to be abstracted and the residual water balance at the end of the dry season.</li> <li>Groundwater abstraction must avoid creating a water stress situation during the dry season for existing groundwater users and must ensure the baseflow of streams is not reduced.</li> <li>No groundwater will be used in locations without additional groundwater capacity – in other locations groundwater will only be used after it has been confirmed through assessment that there will be no additional stress on groundwater resources as a result.</li> <li>If water supply is unavailable on site, ensure regular supply of bottled water meeting drinking water standards to be secured.</li> <li>No groundwater will be used in locations without additional groundwater capacity – in other locations groundwater will only be used after it has been confirmed through assessment that there will be no additional stress on groundwater resources as a result.</li> </ul> | <ul style="list-style-type: none"> <li>GoN laws and regulations (Chapter 2 of IEE)</li> </ul>                                                             | Before design approval for further implementation during construction phase                                        |                           |
|                        | SS Waste management     | <ul style="list-style-type: none"> <li>Provide well designed, covered, segregated materials and waste storage area of sufficient size to accommodate all anticipated storage requirements, ensure storage areas can be locked, are well-ventilated and will not reach extreme temperatures. Ensure space also provided in the storage area for solid and hazardous waste garbage bins to be stored. Fuel/oil/chemical/waste storage areas must have an impervious floor and be bunded so that the capacity of each bund is sufficient to contain at least 110% of the</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>IFC EHS General Guidelines</li> <li>GoN laws and regulations (Chapter 2 of IEE)</li> </ul> | <p>EPC Contractor</p> <p>Include in EPC contract cost</p> <p>Before design approval for further implementation</p> | NEA PMU / PISC            |

| Activity/Sub-component | Issues/Impacts & Risks | Mitigation measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Applicable Project Standards / Guidelines                                                                                                                                                              | Implementation Responsibility (Budget Source and Timing)                                | Monitoring Responsibility |
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|                        |                        | <p>maximum design storage capacity within storage area, bund will not be connected to the surface water drainage system.</p> <ul style="list-style-type: none"> <li>Disposal of waste on-site is prohibited and adequate volume of waste storage areas including for used oil drums etc. need to be provided in the design. Garbage bins for the disposal of waste during O&amp;M to be provided, they are to be enclosed with lids enabling waste to be segregated into compostable, recyclables by type, residual solid waste and hazardous waste. Composting of biodegradable waste may be permitted, thus design to incorporate enclosed composting facilities (enclosed to avoid attraction of vermin etc.) located away from the control building and any properties outside site boundary. Given the distance to solid waste management facilities incineration may be permitted on site if design incorporates an enclosed, small volume solid waste incinerator with stack and pollution control (containerized) that is designed for residence time and temperatures that minimize incomplete combustion for waste disposal and GON emission standards, to reduce the volume of solid waste to be removed off-site given limited suitably engineered and licensed sanitary waste facilities in Nepal. The volume will be no more than 50 kg/hour.</li> <li>Design will include provision for compactors to be used to reduce the volume of solid waste to be removed off site given limited suitably engineered and licensed sanitary waste facilities in Nepal.</li> </ul> |                                                                                                                                                                                                        | during construction phase                                                               |                           |
|                        | SS Health and safety   | <ul style="list-style-type: none"> <li>All electrical hazards will feature written and visual warning signs that meet the IEEE standards to include the ISO 7010 "Hazard Type: Electrical Symbol" warning of the risk of electrocution with an internal fence for high-risk equipment</li> <li>Design to include lightening protection and earthing including earth mats in control buildings</li> <li>Design of control building and other internal workspace to include emergency exits with emergency exit signage</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>IFC EHS General Guidelines/Occupational and Community Health and Safety</li> <li>GoN laws and regulations (Chapter 2 of IEE)</li> </ul> | <p>EPC Contractor</p> <p>Include in EPC contract cost</p> <p>Before design approval</p> | NEA PMU / PISC            |

| Activity/Sub-component | Issues/ Impacts & Risks                    | Mitigation measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Applicable Project Standards / Guidelines                                                                                                                                                                    | Implementation Responsibility (Budget Source and Timing)                         | Monitoring Responsibility |
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|                        |                                            | <ul style="list-style-type: none"> <li>Provide fully stocked, in-date first aid kit installed in a prominent, signed position, first aid posters and emergency contacts to also be displayed</li> <li>Provide eye wash station and water supply to shower located near storage areas for fuel/oil/chemicals</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                              |                                                                                  |                           |
|                        | <u>SS</u><br>Fire safety                   | <ul style="list-style-type: none"> <li>All substation buildings and other project facilities will be designed and constructed according to national fire safety standards, emergency response planning and response as well as international engineering best practice/good EHS practices</li> <li>Separation walls or fire barrier walls shall be provided between the transformers and between transformer and nearby building.</li> <li>Buildings including security cabin and high-risk locations outdoors to include smoke and/or heat detectors</li> <li>Provide automatic fire alarm and fire suppression system in control building and at high-risk locations outdoors .</li> <li>Provide sand buckets, full of sand, placed in a prominent, signed location near to fire-risk locations such as transformers and oil storage areas</li> <li>Provide fire extinguishers (including for oil and electric fires) in a prominent, signed location in all buildings and security cabin and near to fire-risk locations such as transformers, DG sets, and oil storage areas with service and expiration dates clearly labelled along with posters on fire safety.</li> </ul> | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>IFC EHS General Guidelines</li> <li>IFC EHS Electric Power T&amp;D Guidelines</li> <li>GoN laws and regulations (Chapter 2 of IEE)</li> </ul> | EPC Contractor<br><br>Include in EPC contract cost<br><br>Before design approval | NEA PMU / PISC            |
|                        | <u>SS</u><br>Access to substation and road | <ul style="list-style-type: none"> <li>Include a secure boundary fence or wall that is sufficiently high it cannot be climbed over to prevent illegal access, provide a gated, surfaced vehicular access for entry/exit off public highway having adequate sight lines for all drivers and warning signs of entranceway for road users.</li> <li>In addition to secure boundary fence the switchyard and transformers in it to be securely fenced to prevent unauthorized access to electrical equipment.</li> <li>Fencing designs for safety to and from wildlife. Stronger, higher walls with spikes, to prevent small mammals such as monkeys and also unauthorized person's intrusion.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>IFC EHS General Guidelines</li> <li>IFC EHS Electric Power T&amp;D Guidelines</li> <li>GoN laws and regulations (Chapter 2 of IEE)</li> </ul> | EPC Contractor<br><br>Include in EPC contract cost<br><br>Before design approval | NEA PMU / PISC            |

| Activity/Sub-component | Issues/ Impacts & Risks                                   | Mitigation measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Applicable Project Standards / Guidelines                                                                                                                                                                    | Implementation Responsibility (Budget Source and Timing)                                                                                     | Monitoring Responsibility |
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|                        |                                                           | <ul style="list-style-type: none"> <li>No new permanent access roads will be constructed.</li> <li>Existing access roads to the substations will be surfaced with asphalt or concrete prior to the commencement of works to minimize dust impact, the contractor will be responsible for surfacing the roads unless otherwise agreed - the road level must not be increased without adequate drainage being provided to avoid surface water entering adjacent properties where present.</li> <li>Road safety signs including speed limits to be placed on the access roads.</li> <li>Speed limits for traffic once turning off the highway will be capped at 20 km/hr.</li> <li>National speed limits to be followed on the highways.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>IFC EHS General Guidelines</li> <li>GoN laws and regulations (Chapter 2 of IEE)</li> </ul>                                                    | <p>EPC Contractor</p> <p>Include in EPC contract cost</p> <p>Before design approval</p>                                                      | NEA PMU / PISC            |
|                        | TL, SS<br>Geohazards, slope stability and climate hazards | <ul style="list-style-type: none"> <li>Identify presence of any unstable land/steep slopes and avoid these during the detailed design.</li> <li>Select an appropriate design for all civil and structural components including foundations considering climate factors, seismic and slope stability risk</li> <li>All buildings will be designed in accordance with national building safety codes and standards for earthquake resistance plus international good practice seismic design standards.</li> <li>Designs to be checked for seismic safety by design team and by an independent expert, separate to design team, to confirm international good practice seismic design standards are met.</li> <li>Identify any unstable land/steep slopes and avoid these in the layout.</li> <li>If tower or SS sites are not on flat land conduct geotechnical/slope stability analysis with slopes to be graded with drainage installed to minimize landslide risk.</li> <li>Ensure resulting slope design/topography does not exacerbate surface erosion and/or trigger a landslide; all disturbed areas are to be revegetated. Bioengineering methods can be considered for providing slope protection.</li> <li>Project components on slopes must incorporate slope stability measures such as bioengineering methods and retaining walls with adequate drainage to avoid exacerbating surface erosion</li> </ul> | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>IFC EHS General Guidelines</li> <li>IFC EHS Electric Power T&amp;D Guidelines</li> <li>GoN laws and regulations (Chapter 2 of IEE)</li> </ul> | <p>EPC Contractor</p> <p>Include in EPC contract cost</p> <p>Before design approval for further implementation during construction phase</p> | NEA PMU / PISC            |

| Activity/Sub-component | Issues/Impacts & Risks | Mitigation measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Applicable Project Standards / Guidelines                                                                                                                                                                    | Implementation Responsibility (Budget Source and Timing)                                             | Monitoring Responsibility |
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|                        |                        | <p>and/or triggering a landslide. All designs for works in steep topography but especially those on slopes of more than 30 degrees or terraced to be checked by design team and an independent geotechnical engineer, separate to design team, to confirm national standards and international good practice are met.</p> <ul style="list-style-type: none"> <li>Identify presence of floodplain, drainage routes or depressions that get waterlogged in the rainy season and avoid these during detailed design.</li> <li>Conduct flood and drainage risk assessment and incorporate effective drainage design (at 1 in 100 years allowing for climate change) to prevent possible flooding or waterlogging of SS equipment during the wet season.</li> <li>Final surface level of towers and substation will be at least 0.5 m above the existing ground level or highest flood level including an allowance for climate change based on the findings of the climate change assessment prepared for the Project (whichever is higher)</li> <li>Place electrical equipment above the flood level whilst ensuring that surface runoff from the project site is no more than the greenfield runoff rate through attenuation on site (retention ponds) to avoid exacerbating flooding of the adjacent land.</li> <li>All designs shall incorporate climate change adaptation measures per the climate risk assessment for the project.</li> <li>Construction activities must be planned not to limit the availability of or restrict access to water sources (e.g., groundwater) used by local communities</li> </ul> |                                                                                                                                                                                                              |                                                                                                      |                           |
|                        | SS Drainage            | <ul style="list-style-type: none"> <li>Identify and inventory the presence of surface water including streams/ponds and groundwater sources including springs/wells/pumps within the site boundary and adjacent, confirming if any are used by the local communities for drinking water or other purposes</li> <li>Natural flow of any surface water or drains must not be obstructed or if not possible diverted through a drainage system to another direction.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>IFC EHS General Guidelines</li> <li>IFC EHS Electric Power T&amp;D Guidelines</li> <li>GoN laws and regulations (Chapter 2 of IEE)</li> </ul> | EPC Contractor Include in EPC contract cost Before design approval for further implementation during | NEA PMU / PISC            |

| Activity/Sub-component | Issues/ Impacts & Risks                                  | Mitigation measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Applicable Project Standards / Guidelines                                                              | Implementation Responsibility (Budget Source and Timing)                                                                                     | Monitoring Responsibility |
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|                        |                                                          | <ul style="list-style-type: none"> <li>No surface drainage will be permitted to discharge directly to surface water bodies, detailed design to include sediment traps and oil interceptors to be fitted.</li> <li>Provision of oil-water separator on all surface water drainage before discharge off-site.</li> <li>Internal roads will have a camber to allow surface water to run off with side and cross drainage provided.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                        | construction phase                                                                                                                           |                           |
| TL                     | Electrocution and collision risk to notable bird species | <ul style="list-style-type: none"> <li>Bird surveys during overwintering and breeding seasons mapped presence of notable species, bird nests, communal roosts, carcass dumps and movements</li> <li>Detailed design will ensure the transmission lines are routed at least 1 km from nesting sites of notable species at risk of collision, to minimize collision risks to fledglings which are more at risk than adults. If any endangered or critically endangered nesting birds are observed (none to date) then the set back of 2km is recommended</li> <li>Final set back and routing to be agreed in consultation with Bird Conservation Nepal.</li> <li>Spacing between live and ground components will be large enough to avoid electrocution of notable species present</li> <li>Bird diverters will be installed on all forest crossings, crossings of waterbodies</li> <li>Bird diverters must also be an internationally accepted robust design, rotates, of contrasting color, reflects UV light, glows in the dark, and is guaranteed. At minimum the bird divertors to be placed at 10m spacing along the earth wire.</li> <li>Ensure detailed design of OHL HV power lines incorporates lightning protection to minimize forest fire risks.</li> <li>The biodiversity management and monitoring plan (provided in this document) is to be complied to</li> </ul> | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>APLIC guidelines<sup>5</sup></li> </ul> | <p>EPC Contractor</p> <p>Include in EPC contract cost</p> <p>Before design approval for further implementation during construction phase</p> | NEA PMU / PISC            |

<sup>5</sup> <https://www.aplic.org/documents>

| Activity/Sub-component                                    | Issues/ Impacts & Risks                            | Mitigation measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Applicable Project Standards / Guidelines                                                                                                                                                                                                  | Implementation Responsibility (Budget Source and Timing)                                                                                     | Monitoring Responsibility |
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| TL and SS: Equipment specifications and design parameters | SS Polychlorinated Biphenyls (PCB)                 | <ul style="list-style-type: none"> <li>PCBs will not be permitted for use in any transformers at substations or in any other project facilities or equipment.</li> <li>Transformers will have supplier certification stating they are PCB free with an MSDS provided for the transformer oil confirming it.</li> <li>Existing transformers will be tested to confirm they are PCB free.</li> <li>New transformers (once the PCB testing is complete) will be labelled as PCB free.</li> <li>Processes, equipment, and systems not to use chlorofluorocarbons (CFCs) including halon.</li> </ul>                                                                                                                                | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>IFC EHS General Guidelines</li> <li>IFC EHS Electric Power T&amp;D Guidelines</li> <li>Stockholm Convention</li> <li>GoN laws and regulations (Chapter 2 of IEE)</li> </ul> | <p>EPC Contractor</p> <p>Include in EPC contract cost</p> <p>Before design approval for further implementation during construction phase</p> | NEA PMU / PISC            |
|                                                           | TL and SS Exposure to electromagnetic interference | <ul style="list-style-type: none"> <li>Designs to comply with the reference and peak levels of the International Commission on Non-Ionizing Radiation Protection (ICNIRP) for EMF occupational and community exposure will be achieved within the substation and outside of the fence line respectively.</li> <li>Contractor to provide EMF calculations to the PISC for review and approval.</li> <li>Use of shielding equipment/materials to decrease electromagnetic field exposure included at any substation where calculations identify levels above ICNIRP reference levels at properties close to the substation.</li> </ul>                                                                                           | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>IFC EHS General Guidelines</li> <li>IFC EHS Electric Power T&amp;D Guidelines</li> <li>GoN laws and regulations (Chapter 2 of IEE)</li> </ul>                               | <p>EPC Contractor</p> <p>Include in EPC contract cost</p> <p>Before design approval for further implementation during construction phase</p> | NEA PMU / PISC            |
|                                                           | SS Exposure to noise                               | <ul style="list-style-type: none"> <li>Ensure maximum sound power level of equipment at 1 m is 70 dBA through use of sound attenuation. The quietest available equipment with manufacturer supplied noise mitigation will be installed. In areas where 85 dBA will be exceeded OHS noise warning signage identifying that ear protection to be worn must be installed as part of design.</li> <li>Layout substations so transformers, diesel generators and other noise sources are the furthest distance possible from the adjacent receptors to minimize corona noise/transformer hum experienced. Contractors to ensure that the design enables operation to always comply with 1-hour LAeq 70 dB(A) at the site</li> </ul> | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>IFC EHS Guidelines – Noise Management (2007)</li> <li>GoN laws and regulations (Chapter 2 of IEE)</li> </ul>                                                                | <p>EPC Contractor</p> <p>Include in EPC contract cost</p> <p>Before design approval for further implementation during construction phase</p> | NEA PMU / PISC            |

| Activity/Sub-component | Issues/ Impacts & Risks        | Mitigation measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Applicable Project Standards / Guidelines                                                                             | Implementation Responsibility (Budget Source and Timing)                                             | Monitoring Responsibility |
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|                        |                                | <p>boundary plus 55 dB(A) at the nearest commercial receptor, 45 dB(A) at the nearest non-rural residential properties, and 40 dB(A) at the nearest rural residential properties and outside the fence line in a quiet area. If levels are already exceeded the level is not to increase by more than 3dB(A) above the background.</p> <ul style="list-style-type: none"> <li>Given transformers are generally in the range 60-80 dBA at 1m they are to be located at least 5 m inside the substation site boundary but this distance will need to be increase to between 20m – 100m depending on the land use adjacent to the substation for noise limits to be met without additional attenuation. DG sets will similarly need to be located away from the SS boundaries.</li> <li>If the noise levels at the site boundary or receptors cannot be met through siting alone, then an acoustically designed enclosures or fences will be installed around either the noise source and/or substation boundary to enable the required noise level to be met as a permanent installation as part of the design.</li> <li>If residential properties or other sensitive receptors are near the substation boundary, then measurements must be carried out during detailed design and baseline noise calculations (modelling) considering low frequencies associated with transformer hum will be undertaken by the Contractor to demonstrate that the noise standards/guidelines can be met. If background noise levels already exceed the standards/guidelines the design must ensure that noise levels result in a &lt;3dBA increase in background.</li> </ul> |                                                                                                                       |                                                                                                      |                           |
|                        | TL and SS: Hazardous Materials | <ul style="list-style-type: none"> <li>No asbestos containing materials of any type will be used in the design and construction of project facilities.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>GoN laws and regulations (Chapter 2 of IEE)</li> </ul> | EPC Contractor Include in EPC contract cost Before design approval for further implementation during | NEA PMU / PISC            |

| Activity/Sub-component | Issues/ Impacts & Risks     | Mitigation measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Applicable Project Standards / Guidelines                                                                                                                                                                    | Implementation Responsibility (Budget Source and Timing)                                                                                     | Monitoring Responsibility |
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|                        | <u>SS</u><br>Oil Management | <ul style="list-style-type: none"> <li>Secure oil storage areas bunded to 110% of capacity with an impervious floor of sufficient size to accommodate all anticipated oil storage requirements will be provided. Ensure this storage areas covered, can be locked, are well-ventilated, will not reach extreme temperatures and are not connected to the surface water drainage system.</li> <li>Adequate volume of oil storage areas needs to be provided in the design to accommodate all anticipated oil storage requirements.</li> <li>Substation transformers to be mounted on impermeable surface extending beyond the transformer footprint, bunded to 110% capacity and not connected to the surface water drainage system to collect oil spill, leaks, and overflows; transformers to be sited in a separately fenced area that can be kept locked.</li> </ul> | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>IFC EHS General Guidelines</li> <li>IFC EHS Electric Power T&amp;D Guidelines</li> <li>GoN laws and regulations (Chapter 2 of IEE)</li> </ul> | <p>EPC Contractor</p> <p>Include in EPC contract cost</p> <p>Before design approval for further implementation during construction phase</p> | NEA PMU / PISC            |
|                        | <u>SS</u><br>Batteries      | <ul style="list-style-type: none"> <li>DC batteries will use lithium-ion in preference to lead acid or cadmium nickel to minimize the use of heavy metals.</li> <li>Separate room for SS batteries to be provided with ventilation and exhaust fan for taking out fume gases in case of leaks.</li> <li>Design to comply with GIIP for handling, storage and management of batteries.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>IFC EHS General Guidelines</li> <li>IFC EHS Electric Power T&amp;D Guidelines</li> <li>GoN laws and regulations (Chapter 2 of IEE)</li> </ul> | <p>EPC Contractor</p> <p>Include in EPC contract cost</p> <p>Before design approval for further implementation during construction phase</p> | NEA PMU / PISC            |

| Activity/Sub-component            | Issues/ Impacts & Risks           | Mitigation measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Applicable Project Standards / Guidelines                                                                                                                                                                                                                                                               | Implementation Responsibility (Budget Source and Timing)                                                                                     | Monitoring Responsibility |
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|                                   | SS<br>SF6                         | <ul style="list-style-type: none"> <li>Instead of SF6 insulation use of alternative insulation medium (such as Hydrophobic Cycloaliphatic Epoxy) to be considered as a preferred option. If no alternative use of SF6 in gas insulated equipment must be minimized as part of design. Design of any gas insulated equipment to comply with GIIP for handling, storage and management of SF6.</li> <li>SF6 equipment to be hermetically sealed "sealed for life" units and be tested and guaranteed by the supplier to less than 0.1% leakage rate. Installation design and operated so that any leakage will raise an alarm requiring O&amp;M staff to rectify the situation immediately.</li> <li>Provide SF6 leakage detector at each substation</li> <li>SF6 in fire extinguishers provided at substations to be avoided.</li> </ul> | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>IFC EHS General Guidelines</li> <li>IFC EHS Electric Power T&amp;D Guidelines</li> <li>Reducing SF6 Emissions in Electric Power Systems: Best Industry Practices – USEPA</li> <li>GoN laws and regulations (Chapter 2 of IEE)</li> </ul> | <p>EPC Contractor</p> <p>Include in EPC contract cost</p> <p>Before design approval for further implementation during construction phase</p> | NEA PMU / PISC            |
|                                   | SS<br>Diesel generators           | <ul style="list-style-type: none"> <li>Only "green" DG sets are to be used with supplier certification on meeting the project noise standards and GON emission standards.</li> <li>DG sets shall be installed outside in an acoustic enclosure or housed in a separate building away from other buildings. DG sets to be provided with visco damper type vibration dampening pads (suitable for the loads and vibration they are to carry) with minimum vibration transmitted to the surface the DG rests on.</li> <li>Stack emissions of DG set to comply with national emission standards with the stack height designed according to both national and the IFC EHS guideline requirements.</li> </ul>                                                                                                                                | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>IFC EHS General Guidelines</li> <li>IFC EHS Electric Power T&amp;D Guidelines</li> <li>GoN laws and regulations (Chapter 2 of IEE)</li> </ul>                                                                                            | <p>EPC Contractor</p> <p>Include in EPC contract cost</p> <p>Before design approval for further implementation during construction phase</p> | NEA PMU / PISC            |
| TL and SS during detailed designs | TL and SS Community Consultations | <ul style="list-style-type: none"> <li>Contractors to undertake and document meaningful consultations with potentially affected persons and local communities within 500m of the TL and substations as well as other stakeholders including local authorities and public utilities during design in order that any concerns raised can be reflected in the choice of route, site layout and construction method.</li> <li>For smart meters and other components where there is interaction with the community contractors to undertake and document meaningful consultations with potentially affected persons and local communities.</li> </ul>                                                                                                                                                                                        | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> </ul>                                                                                                                                                                                                                                        | <p>EPC Contractor</p> <p>Include in EPC contract cost</p> <p>Before design approval for further implementation during</p>                    | NEA PMU / PISC            |

| Activity/Sub-component | Issues/Impacts & Risks                                         | Mitigation measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Applicable Project Standards / Guidelines                        | Implementation Responsibility (Budget Source and Timing)                                                                              | Monitoring Responsibility |
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|                        | <u>TL and SS</u><br>Review of documentation, update of the IEE | <ul style="list-style-type: none"> <li>Detailed designs will be reviewed by the contractor and NEA to confirm all measures required by the IEE/EMP have been adequately incorporated and that they reflect international engineering best practice/good EHS practice before they are approved.</li> <li>Prior to NEA approval of the designs and commencement of construction, ensure that NEA have updated the IEE as required to reflect the final design, seeking ADB clearance of any updated IEE before works start by contractor.</li> </ul> | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> </ul> | EPC Contractor<br><br>Include in EPC contract cost<br><br>Before design approval for further implementation during construction phase | NEA PMU / PISC            |

| Activity/Sub-component                             | Issues/ Impacts & Risks                               | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Applicable Standards / Best Practice | Project Implementation Responsibility                                                                                                                                                                            | Monitoring Responsibility |
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| <b>Pre-construction Phase, Preparation Phase</b>   |                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                      |                                                                                                                                                                                                                  |                           |
| TL and SS: Safeguard Management Planning - General | General, unanticipated impacts and corrective actions | <ul style="list-style-type: none"> <li>Comply with the definite version of the EMP which is the version disclosed on ADB's website. This includes any measures in an updated IEE following design or any updates in response to unanticipated impacts.</li> <li>Comply with all applicable national and provincial environment, health, and safety (EHS) regulatory requirements in addition to the mitigation measures set out in the EMP – if there is any conflict between national requirements and measures set out in the EMP the most stringent provisions will take precedence</li> <li>Comply with the EHS codes of practice (ECOP) and Labour Accommodation Requirements appended to the IEE</li> <li>Comply with any corrective action plan required by NEA, contractor to cover the costs where corrective action is required due to non-compliance on behalf of the contractor, its subcontractors or third parties.</li> <li>Do not engage in any activities described on the ADB Prohibited Investment Activities List in Appendix 5 of ADB's SPS (2009)</li> <li>Ensure all subcontractors and third parties, irrespective of being formally or informally employed also comply with the EMP and any updates to it, as well as the CSEMP and that this responsibility is cascaded down any chain involved.</li> <li>Put in place appropriate incentives and/or penalties for (non-) compliance by workers related to use of PPE, and any violations of the Contractors Code of Conduct.</li> </ul> | ADB SPS (2009)                       | <p>EPC Contractor</p> <p>Include in EPC contract cost</p> <p>Before the start of any related works including site establishment, preparation and clearance works then ongoing through project implementation</p> | NEA PMU / PISC            |

| Activity/Sub-component | Issues/ Impacts & Risks | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Applicable Project Standards / Best Practice                                                                                                                                          | Implementation Responsibility                                                                                                                                                                                              | Monitoring Responsibility |
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|                        | CSEMP                   | <ul style="list-style-type: none"> <li>Preparation for NEA approval and implementation of the CSEMP and its associated management sub-plans reflecting the EMP requirements and international engineering best practice/good EHS practices-CSEMP shall include subplans as indicated in the EMP main text, such as:</li> </ul> <p><b>1 Construction Method Statement</b><br/>Identifying all construction activities, schedule, access routes, anticipated traffic volumes, and construction methods to be used as well as temporary construction facilities needed and their location e.g., laydown areas, stores, worker rest areas, toilets/washrooms, worker overnight accommodation etc.</p> <p><b>2 Pollution Prevention Plan and Emergency Response Plan(s)</b><br/>Covering dust and emissions to air management, noise management, the protection of water resources and environmentally sound and safe storage, use, and disposal of all fuels, chemicals and oils used on site and an emergency preparedness and response plan in the event of any leaks or spills (e.g., of oil, etc.) or an incident such as flood. Particular attention to receptors in 500m and along access roads. Include clear schedule for damping of site and access roads, description of water resources requirement, and time and activity restraints. Include pollution monitoring procedures and pre-construction data. Including emergency response plan to be prepared for construction to deal with event of an accidental spill leak, including leakage of SF6 as a greenhouse gas.</p> | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>IFC EHS General Guidelines/Electric Power T&amp;D Guidelines</li> <li>ILO Safety and Health in Construction</li> </ul> | <p>EPC Contractor</p> <p>Include in EPC contract cost</p> <p>Before the start of any works including site establishment, preparation and clearance works for NEA approval then implement throughout construction phase</p> | NEA PMU / PISC            |

| Activity/Sub-component | Issues/ Impacts & Risks | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Applicable Project Standards / Best Practice | Implementation Responsibility | Monitoring Responsibility |
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|                        |                         | <p><b>3 Occupational Health and Safety Plan including Risk Assessment and Emergency Response Plan(s)</b><br/>See annex, H&amp;S plan to include emergency preparedness and response plan including flow chart and contact details to deal with situation should any construction worker or community member be impacted.</p> <p><b>4 Community Health and Safety Plan including Risk Assessment and Emergency Response Plan(s)</b><br/>Outlining all the relevant measures in this EMP relating to community health and safety. Community Health and Safety Plan shall include flow chart and contact details to deal with situation should any community member be impacted.</p> <p><b>5 Biodiversity Management: Invasive Species Control Procedures and Wildlife Encounter Protocol</b><br/><br/>Including (i) prohibitions on hunting, poaching, collection of firewood, restricted areas etc. (ii) a wildlife incident reporting procedure and emergency fauna rescue and handling procedure including contractors of forest officials, nearest veterinary etc. (iii) measures to avoid the spread of invasive species, and (iv) a chance find procedure for routine findings of small animals encountered in work areas. For works in 500m of BZ, KBA, IBA and forest land additional ecological supervision will be put in situ.</p> <p><b>6 Solid and Hazardous Waste Management Plan</b></p> |                                              |                               |                           |

| Activity/Sub-component | Issues/ Impacts & Risks | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Applicable Project Standards / Best Practice | Implementation Responsibility | Monitoring Responsibility |
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|                        |                         | <p>Dealing with all solid and hazardous waste as well as wastewater generated in an environmentally sound and safe manner. Where possible it will ensure surplus materials will be reused or recycled, disposal will be the last resort. Plan shall also set out waste monitoring procedures. For smart meters, this will include an e-waste plan for the disposal of old meters to be removed by NEA.</p> <p><b>7 Traffic Management Plan</b><br/>Including detailed site access route and receptors adjacent, parking areas, traffic controls e.g., speed limits, delivery timings, ensuring use of well-maintained vehicles, access road improvements, driver training and permits etc. Considering both the safety of pedestrians and vehicles and need to avoid traffic congestion; it is to be developed in consultation with relevant local authorities to ensure proper execution of traffic controls including where temporary blockage of a road or footpath is needed for installation.</p> <p><b>8 Labor Management Plan</b><br/>Addressing employment of migrant workers, sanitation and welfare, gender-based violence/sexual exploitation, abuse, and harassment prevention etc. Including details of construction camp site/overnight accommodation meeting the requirements of ILO for labor accommodation, see annex.</p> <p><b>9 Implement the EHs Code of Conduct</b></p> <p><b>10 Chance Find Procedure for physical cultural resources</b></p> |                                              |                               |                           |

| Activity/Sub-component | Issues/ Impacts & Risks | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Applicable Project Standards / Best Practice | Implementation Responsibility | Monitoring Responsibility |
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|                        |                         | <p>Measures for coming across unknown archaeology during works including stop works and reporting to the Department of Archaeology.</p> <p><b>11 Communication Plan</b><br/> Outlining stakeholder consultation for the construction period. Provides a schedule for regular meetings, includes different communication methods as identified in the IEE.</p> <p><b>12 Training and Induction Plan</b><br/> Describing the types of EHS training required during construction for staff, schedule of training to be included.</p> <ul style="list-style-type: none"> <li>CSEMP and its associated management sub-plans will be living documents, to be updated as required and re-approved by NEA as construction proceeds, if construction methods or site conditions change, in response to an incident, near miss etc.</li> <li>CSEMP will identify all temporary construction facilities needed e.g., laydown and storage areas, temporary workers facilities etc.</li> </ul> |                                              |                               |                           |

| Activity/Sub-component | Issues/ Impacts & Risks                                                             | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Applicable Project Standards / Best Practice                                                                          | Implementation Responsibility                                                                                                                                                                             | Monitoring Responsibility |
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| TL and SS              | Non-compliance of Regulations, permits etc. Permits and Licenses not obtained/valid | <ul style="list-style-type: none"> <li>Acquire all requisite environment, health, safety and labor permits and licenses for construction activities or construction plant as required by national laws and regulations, prior to the commencement of works and then maintain them.</li> <li>If the route or site has changed since the national IEE approval was granted then it must be confirmed in writing that no further update of the national IEE is required to assess the changes.</li> <li>Statutory H&amp;S and labor requirements including permits, licenses, and insurances for all workers to be obtained and maintained.</li> <li>Medical insurance will be provided for all workers with sick leave allowance of at least 12 days to ensure symptomatic workers do not attend site due to no work-no pay policies.</li> <li>Insurance to include a community liability clause for payment of compensation in case of any accidents because of construction.</li> <li>Where tree cutting cannot be avoided required clearances to be obtained from Department of Forests and Soil Conservation and all pre-construction conditions of clearances complied with prior to the start of related works. Since trees and vegetation are not to be cleared unless essential to allow construction the areas of vegetation to be retained must be marked off from the working zones.</li> </ul> | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>GoN laws and regulations (Chapter 2 of IEE)</li> </ul> | <p>EPC Contractor</p> <p>Include in EPC contract cost</p> <p>Before the start of any works including site establishment, preparation and clearance works then implement throughout construction phase</p> | NEA PMU / PISC            |
| TL and SS              | Inadequate, EHS non-compliance - Temporary facility; Selection                      | <ul style="list-style-type: none"> <li>Local communities within 500m to be consulted when selecting sites for temporary project facilities prior to finalization.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>Project LARP</li> </ul>                                | <p>EPC Contractor</p> <p>Include in EPC contract cost</p>                                                                                                                                                 | NEA PMU / PISC            |

| Activity/Sub-component | Issues/ Impacts & Risks                   | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Applicable Project Standards / Best Practice                                                    | Implementation Responsibility                                                                                                            | Monitoring Responsibility |
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|                        | of temporary construction site/facilities | <ul style="list-style-type: none"> <li>• Provide a central covered warehouse for storage of construction materials etc.</li> <li>• Only volumes of material required for the day's work will be stored on-site</li> <li>• No borrow pits or quarries will be established and only licensed off-site materials will be used. Due diligence will be undertaken before the contractor signs any contract with an existing borrow pit or quarry for fill material etc. This includes a review of the location, licensees etc.</li> <li>• No concrete batching or hot mix will be established.</li> <li>• All temporary facilities including material and waste storage areas and offices will be sited in agreement with NEA</li> <li>• Contractor to seek to locate all temporary construction facilities required including laydown and storage areas within the boundaries of NEA land (substations) except for overnight accommodation that could be provided in existing properties off-site.</li> <li>• If other public or private land is required for temporary construction facilities noisy and dusty facilities or those that may generate sediment laden runoff or wastewater (e.g., refueling areas, maintenance yards, storage areas, temporary worker camps) must be sited 500m from residential property and other sensitive receptors (houses, schools, clinics, temples, etc.) and 100m from surface water or groundwater resource.</li> <li>• Laydown and storage areas that are not potential pollution sources may be located 50m distant but must not block accesses or road use.</li> </ul> | <ul style="list-style-type: none"> <li>• GoN laws and regulations (Chapter 2 of IEE)</li> </ul> | Before the start of any works including site establishment, preparation and clearance works then implement throughout construction phase |                           |

| Activity/Sub-component          | Issues/ Impacts & Risks                                              | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Applicable Project Standards / Best Practice | Implementation Responsibility                                                                                                                                                         | Monitoring Responsibility |
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|                                 |                                                                      | <ul style="list-style-type: none"> <li>No temporary facilities will be established in forest or other natural habitat.</li> <li>No public or private land requiring clearance of vegetation or supporting forest habitat or having waterbodies is to be used. No cutting of trees or mature vegetation clearance will be allowed for temporary facilities.</li> <li>Temporary land use to be negotiated with private landowner and compensated by the Contractor in line with the LARP entitlement matrix, submit land ownership papers and copy of agreement for temporary land use with a photographic record of pre-project condition.</li> <li>A photographic record will be made of the pre-construction condition of land used for temporary facilities before construction to inform the reinstatement works.</li> <li>After completion of the construction work the temporary structures shall be completely removed and the land will be restored to its earlier condition.</li> </ul> |                                              |                                                                                                                                                                                       |                           |
| TL and SS<br>Safeguard Staffing | Inadequate Safeguard staff for supervision, monitoring and oversight | <ul style="list-style-type: none"> <li>NEA, PISC and contractor are to appoint a suitably qualified and experienced, dedicated environment, health and safety staff as per the EMP requirements</li> <li>Ensure each active construction site and subcontractor have adequate health and safety supervision to ensure the H&amp;S of all workers and local communities</li> <li>Do not discriminate and proactively encourage the employment of (i) suitably skilled women, and (ii) local employment for unskilled roles whilst ensuring suitably qualified and experienced workers for skilled roles; noting that all workers must be</li> </ul>                                                                                                                                                                                                                                                                                                                                              | ADB SPS (2009)                               | <p>EPC Contractor</p> <p>Include in EPC contract cost with BOQ line for staff</p> <p>Staff in place prior to the start of construction and ongoing through project Implementation</p> | NEA PMU / PISC            |

| Activity/Sub-component | Issues/ Impacts & Risks   | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Applicable Project Standards / Best Practice | Implementation Responsibility                                                                                                                                     | Monitoring Responsibility |
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|                        |                           | <p>appropriately skilled given the hazardous nature of works.</p> <ul style="list-style-type: none"> <li>No child will be employed, and no under 18s will be engaged on construction site (hazardous work).</li> <li>Provide medical/accident insurance for all workers (formal and informal) for the duration of their contracts as well as at least 12 days of sick leave for all construction workers.</li> <li>National Policy of Labor Act 2074 (2017) to be abided.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                              |                                                                                                                                                                   |                           |
|                        | Induction and Orientation | <ul style="list-style-type: none"> <li>NEA to prepare a detailed training plan upon loan effectiveness detailed how training and awareness raising activities required by the EMP will be conducted.</li> <li>NEA to conduct training with support of PISC. Ensure all members of contractor's safeguards team, design team, and construction management team attend NEA EMP trainings.</li> <li>Contractor to conduct their own trainings for their construction management and provide all workers and visitors on site, irrespective of them being formally or informally employed by the contractor, subcontractor or third party with an EHS induction before being allowed on site – induction to cover orientation on EHS requirements and roles and responsibilities in relation to EMP implementation, dos and don'ts in relation to the construction site, employer provided staff accommodation, code of conduct and interaction with local communities, IBA, forest habitat, interaction with wildlife etc.</li> <li>Ensure topics covered by training and induction include, but are not limited to, good</li> </ul> | ADB SPS (2009)                               | <p>EPC Contractor</p> <p>Include in EPC contract cost</p> <p>Before the start of any works including construction site establishment then on an ongoing basis</p> | NEA PMU / PISC            |

| Activity/Sub-component | Issues/ Impacts & Risks | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Applicable Project Standards / Best Practice | Implementation Responsibility | Monitoring Responsibility |
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|                        |                         | <p>housekeeping at all times; environmentally safe and sound waste management practices; hygiene and communicable disease prevention including HIV/AIDS; gender-based violence and sexual exploitation, abuse and harassment prevention; code of conduct, interaction with local communities and culturally acceptable practices; biodiversity conservation awareness; fire safety prevention; forest fire risk; prohibition on firewood and NTFP collection by workers; prohibition on trapping, hunting, fishing, or poaching by workers; chance find procedures; H&amp;S including use of PPE; etc.</p> <ul style="list-style-type: none"> <li>• Contractors to carry out awareness raising for all construction workers about the GRM at the start of their employment on site including disseminating GRM contact details on noticeboards at construction site offices and at employer provided staff accommodation. Suggestion boxes to be provided for construction workers at construction site offices and at employer provided staff accommodation.</li> <li>• Prepare with guidance of health experts HIV/AIDS and communicable disease information video/brochures/leaflets for distribution to all workers during induction, covering factual health issues as well as behavior change issues around the transmission and infection of HIV/AIDS and other communicable diseases including improved sanitation.</li> <li>• Prepare with guidance of labor experts a worker Code of Conduct and information video/brochure/leaflet for distribution to all</li> </ul> |                                              |                               |                           |

| Activity/Sub-component | Issues/ Impacts & Risks     | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Applicable Project Standards / Best Practice                       | Implementation Responsibility | Monitoring Responsibility |
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|                        |                             | <p>workers during induction addressing culturally acceptable practices etc. Code must be informed by the CSEMP and address the following aspects:</p> <ul style="list-style-type: none"> <li>○ Zero tolerance in respect of health and safety</li> <li>○ Requirement on always wearing PPE on site</li> <li>○ Zero tolerance of bribery or corruption</li> <li>○ Respect for local community and customs, avoiding community conflict situations especially for vulnerable groups</li> <li>○ Zero tolerance of illegal and unacceptable activities/behaviour, including but not limited to engagement in: prostitution; gender-based violence/sexual exploitation, abuse, and harassment; illegal sale or purchase of alcohol; sale, purchase, or consumption of drugs; gambling; fighting</li> <li>○ Alcohol and drugs policy and testing regime</li> <li>○ Role of workers in good housekeeping</li> <li>○ Role of workers in maintaining good hygiene</li> <li>○ Respect of wildlife and the environment</li> <li>○ Description of disciplinary measures for infringement of the code of conduct and other employer rules (e.g., immediate removal from site, fine etc.)</li> </ul> |                                                                    |                               |                           |
| TI and SS Stakeholder  | Disruption to public domain | <ul style="list-style-type: none"> <li>• No works will start until NEA has locally disclosed the IEE and any update to it with</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <ul style="list-style-type: none"> <li>• ADB SPS (2009)</li> </ul> | EPC Contractor                | NEA PMU / PISC            |

| Activity/Sub-component       | Issues/ Impacts & Risks                                                                  | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Applicable Project Standards / Best Practice | Implementation Responsibility                                                                                                                                                       | Monitoring Responsibility |
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| Consultation/ Communications | adjacent TI and SS sites; Advance Notice and Consultation on Works Schedule not provided | <p>executive summary translated into Nepali and any other relevant local languages via the NEA website, NEA offices, existing substations, and construction site offices.</p> <ul style="list-style-type: none"> <li>• Brochures and posters on the main findings of the IEE and where the full version can be accessed, as well as a translation of the executive summary of the IEE, will be printed in local language and made available/displayed for public scrutiny at places easily accessible to affected persons.</li> <li>• Directly liaise one-on-one with receptors immediately adjacent to site boundary and access roads to specifically notify them about the commencement of work etc.</li> <li>• Undertake face-to-face consultations with all communities, residents, schools, clinics, temples in 500m of the site and along access roads to notify them one month prior to the commencement of works of the intended start date and schedule</li> <li>• Prior to the commencement of works all activities will be announced in local papers and on site and local community notice boards at least once month prior to works</li> <li>• Provide information to the general public about the scope and schedule of construction activities and expected disruptions and access restrictions at least 72 hours before they occur.</li> <li>• Local communities as well as individual property owners within 500m are to be consulted when selecting sites for temporary construction facilities outside of substations prior to finalization of their location.</li> </ul> |                                              | <p>Include in EPC contract cost</p> <p>Before the start of any works including site establishment, preparation and clearance works then implement throughout construction phase</p> |                           |

| Activity/Sub-component | Issues/ Impacts & Risks | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Applicable Project Standards / Best Practice                                          | Implementation Responsibility                                                                                                                                                                             | Monitoring Responsibility |
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|                        |                         | <ul style="list-style-type: none"> <li>Road authorities will be notified when oversize heavy loads need to be transported and they will be escorted by the police</li> <li>In relation to cumulative impact contractors to liaise with other utilities regarding the timing and extent of other construction works in the project area of influence and ensure plans for construction works are coordinated so emissions/disruption/ disturbance are minimized.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                       |                                                                                                                                                                                                           |                           |
|                        | GRM not operationalized | <ul style="list-style-type: none"> <li>NEA with support of contractor to inform all potentially affected persons and local communities within 500m of TL and substations and directly affected with other components as well as the GRM process and means of submitting project grievance to Inform all residents and businesses of the GRM in advance of works (at least one month).</li> <li>Community awareness raising of the GRM will be undertaken verbally, through community meetings, one-on-one consultations with landowners; through the distribution of notices/pamphlets/posters; and through other media outlets.</li> <li>Provide notice boards at all substations, construction site offices and active work sites including details of the GRM including the name, designation, contact numbers including phone/SMS/What's App, address of both the NEA and contractor's GRM focal persons plus the timeline and process of redressal together with a suggestion box that will be regularly checked for any grievances received.</li> </ul> | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>Project GRM</li> </ul> | <p>EPC Contractor</p> <p>Include in EPC contract cost</p> <p>Before the start of any works including site establishment, preparation and clearance works then implement throughout construction phase</p> | NEA PMU / PISC            |
| TL and SS              | Hydrology - Water Use   | <ul style="list-style-type: none"> <li>Any piling, drilling or excavation works within 50m of boreholes and wells used as a</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> </ul>                      | EPC Contractor                                                                                                                                                                                            | NEA PMU / PISC            |

| Activity/Sub-component | Issues/ Impacts & Risks | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Applicable Project Standards / Best Practice                                                                                                                                                                         | Implementation Responsibility                                                                                                                                                       | Monitoring Responsibility |
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|                        |                         | <p>drinking water source by local communities will require pre-construction and post construction water quality monitoring against GoN drinking water standards to ensure there is no contamination of the supply.</p> <ul style="list-style-type: none"> <li>Construction water to ideally be sourced from an existing licensed commercial supplier (preferred option especially for potable water supplies) where available or rainwater harvesting.</li> <li>If using an existing surface water or an existing borewell for construction water, permissions to be obtained from authorities together with the agreement of local communities.</li> <li>Prior agreement is required from local community users to use any existing surface water/borewell or local piped water either temporarily during construction or permanently for substations; in cases where use of local water source is not agreed contractor to import tanked water to the project area.</li> <li>No groundwater will be used in districts without additional groundwater capacity – in other districts groundwater will not be used only after it has been confirmed through assessment there will be no additional stress on groundwater resources as a result.</li> </ul> | <ul style="list-style-type: none"> <li>GoN laws and regulations (Chapter 2 of IEE and Annex X of this document)</li> </ul>                                                                                           | <p>Include in EPC contract cost</p> <p>Before the start of any works including site establishment, preparation and clearance works then implement throughout construction phase</p> |                           |
|                        | Water Pollution         | <ul style="list-style-type: none"> <li>If any surface waterbodies or groundwater sources are within 500m, undertake a baseline water quality sampling as per the EMoP to confirm their current water quality status at least one week prior to the commencement of any activity onsite.</li> <li>Plan for designated impermeable fuel/oil/chemical hazardous materials/waste</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>IFC EHS Guidelines: wastewater and ambient water quality</li> <li>GoN laws and regulations (Chapter 2 of IEE and Annex X of this document)</li> </ul> | <p>EPC Contractor</p> <p>Include in EPC contract cost</p> <p>Before the start of any works including site</p>                                                                       | NEA PMU / PISC            |

| Activity/Sub-component | Issues/ Impacts & Risks                           | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Applicable Project Standards / Best Practice                                                                                                       | Implementation Responsibility                                                                                                                                                                             | Monitoring Responsibility |
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|                        |                                                   | <p>storage areas bunded to 110% capacity and located at least 50m from surface water and groundwater sources.</p> <ul style="list-style-type: none"> <li>Storage areas should be capable of storing all the hazardous materials used and waste materials generated.</li> <li>Storage areas shall be well ventilated.</li> <li>Fuel and diesel storage tanks will be sited in suitably sized and constructed bunded areas that are designed to be impervious to water and fuel. The bund volume will be designed to no less than 110% of the tank volume. Loading and off-loading connections will be located over secondary containment. All health and safety provisions will be made for fire hazard etc.</li> <li>Refuelling procedure will be developed, which will include a restriction on refuelling within 50m of any watercourse. Designated areas with impermeable surface will be assigned for refuelling to minimize spillage to soil.</li> </ul> |                                                                                                                                                    | establishment, preparation and clearance works then implement throughout construction phase                                                                                                               |                           |
| TL and SS              | Disruption to utilities and Infrastructure supply | <ul style="list-style-type: none"> <li>Check with relevant local authorities (electric, water, telecoms) whether there are known pipes, cables, or other utility lines and carry out a scan using cable avoidance tool to identify any unknown underground utilities prior to excavation.</li> <li>Contractors to identify in consultation with service providers appropriate measures to minimize period of disruption to utilities and reduce health and safety risks during installation. If services must be disrupted contractors (via service providers if appropriate) to notify affected communities well in advance of any power outage etc.</li> </ul>                                                                                                                                                                                                                                                                                              | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>GoN laws and regulations (Chapter 2 of IEE and Annex X of this document)</li> </ul> | <p>EPC Contractor</p> <p>Include in EPC contract cost</p> <p>Before the start of any works including site establishment, preparation and clearance works then implement throughout construction phase</p> | NEA PMU / PISC            |

| Activity/Sub-component | Issues/ Impacts & Risks | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Applicable Project Standards / Best Practice | Implementation Responsibility | Monitoring Responsibility |
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|                        |                         | <ul style="list-style-type: none"> <li>Should utilities need relocating or required to be removed consult with the relevant utilities and local community to ensure that there is no change in supply because of these changes.</li> <li>Obtain necessary clearances consistent with the regulatory requirements from other utilities that could be affected by the Project (municipality for street furniture, electric, water, sewerage, telecommunications, road, rail etc.)</li> <li>All electricity and gas supply networks in the Project area will be kept operational, particularly during the winter months. Liaise with the relevant utilities operators to ensure they remain operational.</li> <li>In relation to cumulative impact liaise with other utilities regarding the timing and extent of other construction works in the same location and ensure plans for construction works are coordinated so emissions/disruption/ disturbance are minimized.</li> <li>For private property or public utilities/street furniture that may be damaged during construction, including from potential breaking/drilling vibration damage (buildings, roads, drains etc.) photographic and/or structural pre-condition surveys are to be completed and agreed with NEA prior to any works, including site establishment. To be documented in a pre-project condition report, which will serve as baseline in case any inadvertent damage or vibration impact to property occurs. If risk of structural damage to adjacent properties from vibration identified due to current condition, consider</li> </ul> |                                              |                               |                           |

| Activity/Sub-component | Issues/ Impacts & Risks                                         | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Applicable Project Standards / Best Practice                                                                                                                                                                                                                                                                                                                                                         | Implementation Responsibility                                                                                                                                                                             | Monitoring Responsibility |
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|                        |                                                                 | alternative construction methods or temporary relocation of occupants during works if at risk.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                           |                           |
| TI and SS              | Occupational Health and Safety incidents, accidents, fatalities | <ul style="list-style-type: none"> <li>Strictly implement all the OHS measures outlined in the annex and all the measures outlined below.</li> <li>Informed by risk assessment prepare H&amp;S plan for approval by NEA in accordance with the IFC EHS General Guidelines on OHS, considering occupational and community H&amp;S and including adherence to electrical safety standards and emergency preparedness and response plan with communication systems and protocols to report an emergency.</li> <li>For all pre-construction and construction works comply with GoN rules and regulations for the protection of workers.</li> <li>During construction works, ensure qualified first aider and trained fire marshal is always available on-site with an appropriately equipped first aid kit and appropriate fire extinguisher and other firefighting equipment immediately available for use.</li> <li>Contractors will set up an accident reporting system for any health and safety incidents (near miss, minor, lost time, fatal) involving workers or community to be reported to NEA within 24 hours of occurrence with a</li> </ul> | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>Project GRM</li> <li>IFC EHS Guidelines: Electrical Power and Distribution (2007)</li> <li>IFC General EHS Guidelines: Occupational Health and Safety</li> <li>IFC General EHS Guidelines: Community Health and Safety</li> <li>ILO safety and health in construction</li> <li>GoN laws and regulations (Chapter 2 of IEE)</li> </ul> | <p>EPC Contractor</p> <p>Include in EPC contract cost</p> <p>Before the start of any works including site establishment, preparation and clearance works then implement throughout construction phase</p> | NEA PMU / PISC            |

| Activity/Sub-component | Issues/ Impacts & Risks | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Applicable Project Standards / Best Practice | Implementation Responsibility | Monitoring Responsibility |
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|                        |                         | <p>response plan detailing the incident and how its reoccurrence will be avoided within 48 hours. Record of all incidents and response taken should include date, time, details of incident, treatment given and outcome, and lessons learnt for the future. Contractors will ensure all workers are covered by insurance to pay out in the event of a disability or fatality.</p> <ul style="list-style-type: none"> <li>• Emergency contact number and details for medical, fire, etc. are to be displayed in all construction sites.</li> <li>• Plan to include emergency drills to be held to ensure prompt response to medical incident or natural hazard that did occur.</li> <li>• If working under live lines (HV or LV) then a safety scaffold will be installed so that the workers cannot come in contact with the OHL, with warning signs provided – all works under HV and LV lines must have an activity specific risk assessment and management plan given the high risk of an incident</li> </ul>  |                                              |                               |                           |

| Activity/Sub-component | Issues/ Impacts & Risks  | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Applicable Project Standards / Best Practice | Implementation Responsibility                                                                                                                                                                             | Monitoring Responsibility |
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|                        | Labour and accommodation | <ul style="list-style-type: none"> <li>• Design of temporary worker camps/overnight accommodation to conform to national requirements and international good practice per the annex.</li> <li>• Contractors to provide all basic requirements (beds and beddings, mosquito nets, artificial lights, natural light, windows and ventilation, fans, emergency exits, firefighting equipment, kitchen and dining halls, mobile charging points, toilets and washing facilities, potable drinking water, recreational space etc. The contractor shall ensure the camps established for providing accommodation to laborers engaged in construction activities meet the requirements which are set out in the annex.</li> <li>• No temporary worker camps/overnight accommodation will be established in forest or other natural habitat.</li> <li>• Shaded rest area that is accessible and can accommodate the number of workers at the active works site</li> <li>• Tents may be used for day rest areas but all overnight accommodation for workers must be provided in a structurally sound built structure providing adequate shelter from rain, wind etc.</li> </ul> |                                              | <p>EPC Contractor</p> <p>Include in EPC contract cost</p> <p>Before the start of any works including site establishment, preparation and clearance works then implement throughout construction phase</p> | NEA PMU / PISC            |

| Activity/Sub-component | Issues/ Impacts & Risks     | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Applicable Project Standards / Best Practice | Implementation Responsibility                                                                                                                                                                             | Monitoring Responsibility |
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|                        |                             | <ul style="list-style-type: none"> <li>Source water from an existing licensed commercial supplier (preferred option) where available</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                              |                                                                                                                                                                                                           |                           |
|                        | Sub-contractors             | <ul style="list-style-type: none"> <li>All subcontractors and third parties irrespective of being formally or informally employed will comply with the EMP and updates to it, as well as this CSEMP, and this responsibility must be cascaded down any chain involved through their subcontract</li> <li>All sub-contractors will be supplied with copies of the EMP and CSEMP.</li> <li>Provisions will be incorporated into all works sub-contracts to ensure compliance with the CSEMP at all tiers of the sub-contracting.</li> <li>All works subcontractors in the chain will be required to appoint an EHS representative who will be available on each work site at all times when their workers or their subcontractors are working during construction to support the main contractor in providing oversight of the subcontracted activities.</li> <li>Use of work gangs and daily labor is highly discouraged due to less control over health and safety -- if used by any subcontractor in the chain the contractor will be required to provide additional environment, health and safety supervision.</li> </ul> |                                              | <p>EPC Contractor</p> <p>Include in EPC contract cost</p> <p>Before the start of any works including site establishment, preparation and clearance works then implement throughout construction phase</p> | NEA PMU / PISC            |
|                        | <u>Workers</u><br>Grievance | <ul style="list-style-type: none"> <li>Establish a formal Grievance Mechanism for workers.</li> <li>Carry out awareness raising amongst formally and informally employed workers including those of sub-contractors about the GRM at the start of their employment, including details of how to submit a grievance to the PMU/PISC and/or to the Contractor.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                              | <p>EPC Contractor</p> <p>Include in EPC contract cost</p> <p>Before the start of any works including site establishment,</p>                                                                              | NEA PMU / PISC            |

| Activity/Sub-component | Issues/ Impacts & Risks                                                    | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Applicable Project Standards / Best Practice                                                                                                                                                                    | Implementation Responsibility                                                                                                                                                                                              | Monitoring Responsibility |
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| <u>TL and SS</u>       | Community Health and Safety risks/impacts due to dust, noise and vibration | <ul style="list-style-type: none"> <li>Contractor to undertake baseline noise and air quality monitoring per the EMoP to confirm current background levels in the project area at least one week prior to the commencement of any actively on-site.</li> <li>Contractor will be required to measure and confirm the distance from their construction works to sensitive receptors to confirm if the noise standards can be met based on their construction methods or if temporary acoustic barriers are required.</li> <li>Contractor to avoid soil compaction, piling, blasting and other vibration inducing activities as much as possible</li> <li>If piling, blasting or other vibration inducing activities are to be undertaken for construction a detailed construction noise/vibration assessment is to be undertaken by the contractor to demonstrate how construction noise and vibration levels/guidelines can be achieved at the site boundary and nearest receptors and a piling/blasting management plan is to be prepared for approval.</li> <li>In locations where this is unavoidable Contractor to identify properties within the zone of influence and undertake pre-construction structural surveys to identify level of risk. If risk of structural damage to properties identified due to current condition, consider alternative construction method or</li> </ul> | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>IFC EHS General Guidelines/Electric Power T&amp;D Guidelines GoN laws and regulations (Chapter 2 of IEE and Annex X of this document)</li> </ul> | <p>EPC Contractor</p> <p>Include in EPC contract cost</p> <p>Before the start of any works including site establishment, preparation and clearance works for NEA approval then implement throughout construction phase</p> | NEA PMU / PISC            |



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| Activity/Sub-component | Issues/ Impacts & Risks    | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Applicable Project Standards / Best Practice                                                                                                                                                | Implementation Responsibility                                                                                                                                                                                              | Monitoring Responsibility |
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|                        |                            | temporary relocation of occupants during works if at risk. Consider need to install monitors during construction to monitor structural movement. Structural or cosmetic damage to be repaired by Contractor to at least pre-project condition at their own cost.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                             |                                                                                                                                                                                                                            |                           |
|                        | Community Safety Awareness | <ul style="list-style-type: none"> <li>In conjunction with the local municipality or village head in rural areas plus the media organize health and safety campaigns including the distribution of posters, leaflets, and safety booklets to all households in Nepali or local language with strong use of graphics for construction and electrical safety community awareness raising activities in local communities and schools within 500 m of the TL and substations prior to construction and then again prior to commissioning of substations about how to avoid electrical incidents having greater emphasis on operational hazard and risks, etc. Materials will be written in non-technical language and will provide illustrations where practical.</li> <li>Deliver face-to-face electrical safety awareness training to local children including their parents and/or their teachers at all educational facilities within at least 500m.</li> <li>Provide construction work site safety awareness sessions at all educational facilities within 500m of any work zone and along access roads used by construction traffic.</li> </ul> | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>IFC EHS General Guidelines/Electric Power T&amp;D Guidelines</li> <li>GoN laws and regulations (Chapter 2 of IEE)</li> </ul> | <p>EPC Contractor</p> <p>Include in EPC contract cost</p> <p>Before the start of any works including site establishment, preparation and clearance works for NEA approval then implement throughout construction phase</p> | NEA PMU / PISC            |

| Activity/Sub-component | Issues/ Impacts & Risks                                | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Applicable Project Standards / Best Practice                                                                          | Implementation Responsibility                                                                                                                                                                                              | Monitoring Responsibility |
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|                        |                                                        | <ul style="list-style-type: none"> <li>Provide EMF awareness sessions at villages within 500m of TL and substations. The awareness sessions should provide information regarding the findings of the IEE on EMF and specifically discuss best practice reference limits for EMF and how they have been applied to the Project.</li> <li>Develop and distribute leaflets/pamphlets/posters to the local community especially those living close to construction camps covering (i) health awareness including HIV/AIDS/STDs and other communicable diseases, and (ii) the conduct of construction workers that can be expected. Materials will be written in non-technical language and will provide illustrations where practical.</li> <li>Keep a record of the number of leaflets distributed and their locations.</li> </ul> |                                                                                                                       |                                                                                                                                                                                                                            |                           |
| TL and SS              | Chance Finds and damage to Physical Cultural Resources | <ul style="list-style-type: none"> <li>In consultation with the local community contractor will maintain an inventory of above ground physical cultural resources adjacent to the site and along the access roads checking against the findings of the IEE, including any trees where prayers/rituals are performed, and take measures to protect them during construction.</li> <li>For physical cultural resources that shall be impacted receptor-specific management plan will be developed in consultation with the local community to ensure significant adverse impacts can be avoided.</li> <li>Demarcation of the working area by the contractor and avoidance of encroachment outside the agreed corridor of impact. Also, demarcation of physical cultural resources</li> </ul>                                      | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>GoN laws and regulations (Chapter 2 of IEE)</li> </ul> | <p>EPC Contractor</p> <p>Include in EPC contract cost</p> <p>Before the start of any works including site establishment, preparation and clearance works for NEA approval then implement throughout construction phase</p> | NEA PMU / PISC            |

| Activity/Sub-component | Issues/ Impacts & Risks | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Applicable Project Standards / Best Practice | Implementation Responsibility | Monitoring Responsibility |
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|                        |                         | <p>(such as shrines, trees) to be avoided and retained.</p> <ul style="list-style-type: none"> <li>• Ensure workers do not loiter outside of temples etc.</li> <li>• A chance find procedure will be developed for implementation in the event physical cultural resources are found, to include the following procedures: <ul style="list-style-type: none"> <li>○ If suspected physical cultural resources are encountered, all works at the find site should be immediately halted;</li> <li>○ The find should be assessed by a competent local official managing cultural issues, and procedures to avoid, minimize or mitigate impacts to such physical cultural objects should be agreed in writing with them.</li> <li>○ Work should not begin until the procedures to avoid, minimize or mitigate impacts to the physical cultural resources have been agreed and implemented in full.</li> <li>○ If avoidance is not feasible, and no alternatives to removal exist, and the project benefits outweigh the anticipated cultural heritage loss from removal which is unlikely unless in case of resource of local value, following clearance of Department of Archaeology and ADB the physical cultural resources should be removed and preserved using the best available technique in accordance with relevant provisions</li> </ul> </li> </ul> |                                              |                               |                           |

| Activity/Sub-component | Issues/ Impacts & Risks                                              | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Applicable Project Standards / Best Practice                                                                          | Implementation Responsibility                                                                                                                                                                             | Monitoring Responsibility |
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|                        |                                                                      | <ul style="list-style-type: none"> <li>of national heritage protection laws and decrees. <ul style="list-style-type: none"> <li>Records should be maintained of all finds, including chain of custody instructions for movable finds.</li> </ul> </li> <li>All construction workers to be made aware of the chance-find procedure and types of finds to be reported.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                       |                                                                                                                                                                                                           |                           |
| TL and SS              | Impact/damage of Biodiversity/vegetation/wildlife -Project Footprint | <ul style="list-style-type: none"> <li>Along with EMP, implement BMMP</li> <li>Per the EMoP Contractors will employ an ecologist to undertake tree enumeration to quantify the number, size and species of trees to be cut by them.</li> <li>Contractor to employ field ecologists to undertake ROW and site walkover, map habitats beneath towers and ROW confirming if modified or natural habitat present, and listing species encountered. In forest habitat the quality of forest cover lost will be confirmed. Submit ecological survey report alongside design.</li> <li>Presence or absence of sensitive receptors and critical habitat species identified in IEE to be confirmed by field ecologists during route surveys including detailed species surveys as required by the IEE. Adaptive management measures to be applied according to the findings of the surveys, e.g. realignment to avoid tree roots, etc.</li> <li>Carefully select route alignments and substation layouts to avoid or at least minimize the need to cut/trim trees by avoiding areas with a high concentration of trees, mature trees must be retained</li> <li>Demarcation of the working area and avoid encroachment outside the agreed corridor of impact. Mature trees and sensitive habitats</li> </ul> | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>GoN laws and regulations (Chapter 2 of IEE)</li> </ul> | <p>EPC Contractor</p> <p>Include in EPC contract cost</p> <p>Before the start of any works including site establishment, preparation and clearance works then implement throughout construction phase</p> | NEA PMU / PISC            |

| Activity/Sub-component | Issues/ Impacts & Risks                                          | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Applicable Project Standards / Best Practice                                                                          | Implementation Responsibility                                                                                                                                                                             | Monitoring Responsibility |
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|                        |                                                                  | <p>that need to be avoided during construction (e.g., specific trees that are to be retained) will be marked for protection. Do not clear any vegetation unless it is essential to allow construction.</p> <ul style="list-style-type: none"> <li>Follow design drawings and implement careful construction practices to avoid damage to trees and vegetation. Only marked trees within the site are to be felled after joint verification with NEA and approval of the tree lists and confirmation contractor is meeting all permits etc.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                       |                                                                                                                                                                                                           |                           |
| SS                     | <u>Inadequate</u><br>Waste Management, presence of Old Equipment | <ul style="list-style-type: none"> <li>Disposal of old transformers and other hazardous wastes shall be per national regulations. Other wastes will be recycled using authorized vendors or suitably engineered and licensed waste management facilities for inert or solid waste.</li> <li>If any PCB contaminated transformers are to be disposed of the use of facilities capable of safely transporting (closed trucks) and disposing of hazardous waste containing PCBs will be a requirement.</li> <li>Any areas of oil leaks beneath existing equipment to be removed will be excavated, stored in labelled metal drums and returned to the Contractors facilities for storage according to method statements. The labelled containers will include a reference number which correlates with the removed transformer which will be tested for PCBs using rapid test kits.</li> <li>If the PCB tests indicate that the transformer oil is contaminated, the container containing the soils will be labelled as PCB waste. PCB</li> </ul> | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>GoN laws and regulations (Chapter 2 of IEE)</li> </ul> | <p>EPC Contractor</p> <p>Include in EPC contract cost</p> <p>Before the start of any works including site establishment, preparation and clearance works then implement throughout construction phase</p> | NEA PMU / PISC            |

| Activity/Sub-component | Issues/ Impacts & Risks                      | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Applicable Project Standards / Best Practice                                                                          | Implementation Responsibility                                                                                                                                                                             | Monitoring Responsibility |
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|                        |                                              | waste shall be stored, handled and disposed of in line with national regulations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                       |                                                                                                                                                                                                           |                           |
| TI and SS              | Sustainable Procurement<br>Material Sourcing | <ul style="list-style-type: none"> <li>Considering relevant technical and commercial considerations, the Project will seek to purchase goods and services from within Nepal.</li> <li>Environmental considerations will be included in the procurement process.</li> <li>Contractors will use locally sourced materials as far as practical to reduce transportation, but all raw materials will be sourced only from existing licensed sources.</li> <li>Only already existing state licensed borrow pits for land raising will be allowed for use. Provide copies of the borrow pit operator's license and permit before any materials from the borrow pit are delivered to site.</li> <li>Materials will not be sourced from quarries in the beds or rivers or other permanent watercourses even if they are licensed.</li> <li>Construction water to be sourced from an existing licensed commercial supplier (preferred option especially for potable water supplies), where available, or rainwater harvesting. If using an existing surface water or an existing borewell for construction water, permissions to be obtained from the relevant authorities together with the agreement of local communities.</li> <li>Prior agreement is required from local community users to use any existing surface water/borewell or local piped water temporarily during construction; in cases where use of local water source is not agreed, contractor to import tanked water to the project area.</li> </ul> | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>GoN laws and regulations (Chapter 2 of IEE)</li> </ul> | <p>EPC Contractor</p> <p>Include in EPC contract cost</p> <p>Before the start of any works including site establishment, preparation and clearance works then implement throughout construction phase</p> | NEA PMU / PISC            |

| Activity/Sub-component | Issues/ Impacts & Risks                         | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Applicable Project Standards / Best Practice                                                                          | Implementation Responsibility                                                                                 | Monitoring Responsibility |
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|                        |                                                 | <ul style="list-style-type: none"> <li>No groundwater will be used in locations without additional groundwater capacity – in other locations groundwater will only be used after it has been confirmed through assessment that there will be no additional stress on groundwater resources as a result.</li> <li>Construction water to be sourced from an existing licensed commercial supplier (preferred option especially for potable water supplies), where available, or rainwater harvesting. If using an existing surface water or an existing borewell for construction water, permissions to be obtained from the relevant authorities together with the agreement of local communities.</li> <li>Prior agreement is required from local community users to use any existing surface water/borewell or local piped water temporarily during construction; in cases where use of local water source is not agreed, contractor to import tanked water to the project area.</li> <li>Records to be kept of all the materials used and source with copies of licenses etc.</li> <li>Procedures will be established to determine the acceptability of material storage conditions and to promote the minimization of storage volumes on-site.</li> </ul> |                                                                                                                       |                                                                                                               |                           |
| TL and SS              | Employment - Economy Employment and Livelihoods | <ul style="list-style-type: none"> <li>Targets for local recruitment from the local communities will be agreed with NEA based on initial assessment of the labor market for unskilled and semi-skilled work force.</li> <li>Seek to manage employment expectations by explaining the number and type of opportunities in advance to local communities.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>GoN laws and regulations (Chapter 2 of IEE)</li> </ul> | <p>EPC Contractor</p> <p>Include in EPC contract cost</p> <p>Before the start of any works including site</p> | NEA PMU / PISC            |

| Activity/Sub-component | Issues/ Impacts & Risks | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Applicable Project Standards / Best Practice | Implementation Responsibility                                                               | Monitoring Responsibility |
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|                        |                         | <ul style="list-style-type: none"> <li>Applications for employment will only be considered if submitted via the official application procedure.</li> <li>Recruitment procedures will be transparent, public, and non-discriminatory and open with respect to ethnicity, religion, sexuality, disability or gender.</li> <li>Clear job descriptions will be provided in advance of recruitment and will explain the skills required for each post.</li> <li>Job vacancies will be advertised in the local communities through appropriate and accessible media.</li> <li>For unskilled use a 'ballot' system to ensure that employment is fair and not weighted to connected people for unskilled roles.</li> </ul> |                                              | establishment, preparation and clearance works then implement throughout construction phase |                           |
|                        | Workers' Rights         | <ul style="list-style-type: none"> <li>Contractor to allow collective bargaining and ensure that ILO core labor standards to which Nepal is a signatory are upheld.</li> <li>All employees will receive at least the minimum wage as defined by national legislation.</li> <li>All workers will have contracts describing their job description and conditions of work and will have the contents explained to them.</li> </ul>                                                                                                                                                                                                                                                                                    |                                              |                                                                                             |                           |
|                        |                         | <ul style="list-style-type: none"> <li>Employee Code of Conduct will prohibit the workforce from participating in illegal activities, including use of illegal drugs, bribery and corruption or requesting or receiving gifts from communities.</li> <li>Policy limiting alcohol consumption in construction camps will be applied</li> <li>Workforce training will include a briefing on camp rules and awareness of local social issues and sensitivities.</li> <li>No unauthorized access to, or use of, any camp facilities will be allowed.</li> </ul>                                                                                                                                                        |                                              |                                                                                             |                           |

| Activity/Sub-component | Issues/ Impacts & Risks | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                 | Applicable Project Standards / Best Practice | Implementation Responsibility | Monitoring Responsibility |
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|                        |                         | <ul style="list-style-type: none"> <li>Review measures to mitigate community health and safety impacts regularly, and consult community leaders every six months, informing them on the status of implementation and results, and discussing any changes needed to the Pollution Prevention Plan or the Community Health and Safety Plan in advance of proposed changes.</li> </ul> |                                              |                               |                           |

| Activity/<br>Sub-compone<br>nt                      | Impact / Issue          | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Applicable<br>Project<br>Standards / Best<br>Practice                                                                                                                                                                                      | Implementation<br>Responsibility                                                  | Monitoring<br>Responsibility |
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| <b>Construction Phase</b>                           |                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                            |                                                                                   |                              |
| TL and SS<br>–<br>Training/ca<br>pacity<br>building | Pollution<br>Prevention | <ul style="list-style-type: none"> <li>Conduct bi-monthly training of workers on pollution prevention control including good housekeeping and how to clean up oil/fuel spills and dispose of contaminated sorbent material which would be treated as a hazardous waste. Include emergency preparedness and response procedures (drills) in case of spill. To include training for subcontractors before commencement of works.</li> <li>Information will also be incorporated into the site induction process and will outline the role of personnel in the management of waste and emissions from site and spill response procedures.</li> <li>Site induction training will be supplemented by regular toolbox talks with relevant personnel if inspections or audits highlight failings in waste management.</li> </ul>                                                                                                                                                                                                                                                                                                                        | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>IFC EHS General Guidelines/Electric Power T&amp;D Guidelines</li> <li>GoN laws and regulations (Chapter 2 of IEE)</li> </ul>                                                | EPC Contractor<br><br>Include in EPC contract cost<br><br>Throughout construction | NEA PMU / PISC               |
|                                                     | OHS                     | <ul style="list-style-type: none"> <li>Conduct daily toolbox talks on pertinent topics related to the day's work and weekly training on occupational health and safety for all construction workers including refreshers. To include training for subcontractors before commencement of works.</li> <li>Ensure workers with a specific role have attended specialized health and safety trainings related that role e.g., health and safety stewards, first aiders, fire safety officers, as well as ensuring workers have received task-specific trainings for working at height, demolition, working with electricity, etc.</li> <li>Only allow suitably trained and qualified workers to work on electrical equipment and at height, these workers must have training record of attending suitable training course on electrical safety and working at height and be provided with and wear the appropriate PPE for their role.</li> <li>No workers shall be allowed to work at height unless they have passed a vertigo test</li> <li>Untrained workers must not be permitted to work with live electricity or to work at height.</li> </ul> | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>IFC EHS General Guidelines/Electric Power T&amp;D Guidelines</li> <li>ILO safety and health in construction</li> <li>GoN laws and regulations (Chapter 2 of IEE)</li> </ul> | EPC Contractor<br><br>Include in EPC contract cost<br><br>Throughout construction | NEA PMU / PISC               |
|                                                     | Emergency<br>Response   | <ul style="list-style-type: none"> <li>Conduct monthly training involving all workers on emergency preparedness and response procedures (drills) in case of an occupational or community health and safety incident during</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> </ul>                                                                                                                                                                           | EPC Contractor                                                                    | NEA PMU / PISC               |

| Activity/<br>Sub-<br>component         | Impact / Issue  | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Applicable<br>Project<br>Standards / Best<br>Practice                                                                                                                                                                                      | Implementation<br>Responsibility                                                         | Monitoring<br>Responsibility |
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|                                        |                 | <p>construction works including fire, natural disaster, disease outbreak etc. To include training for subcontractors before commencement of works.</p> <ul style="list-style-type: none"> <li>Emergency preparedness and response training for construction management will include modules on first aid and fire safety including include training on how to use first aid and firefighting equipment provided on-site, and scenario of potential or confirmed infection.</li> </ul> | <ul style="list-style-type: none"> <li>IFC EHS General Guidelines/Electric Power T&amp;D Guidelines</li> <li>ILO safety and health in construction</li> <li>GoN laws and regulations (Chapter 2 of IEE)</li> </ul>                         | <p>Include in EPC contract cost</p> <p>Throughout construction</p>                       |                              |
|                                        | Driver Training | <ul style="list-style-type: none"> <li>Driver training, monthly, to include advice on behaviours to reduce the potential for disturbance, including use of horn, loud radios with windows open, switching engines off when not in use, strictly observing speed limits and not accelerating or braking aggressively.</li> </ul>                                                                                                                                                       | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>IFC EHS General Guidelines/Electric Power T&amp;D Guidelines</li> <li>ILO safety and health in construction</li> <li>GoN laws and regulations (Chapter 2 of IEE)</li> </ul> | <p>EPC Contractor</p> <p>Include in EPC contract cost</p> <p>Throughout construction</p> | NEA PMU / PISC               |
| TL and SS: Communications/Consultation | GRM             | <ul style="list-style-type: none"> <li>Contractor's safeguards team will act as site GRM Focal and keep affected persons and local communities informed of the status of work and be readily available onsite to receive, document and deal with grievances at site level.</li> <li>Encourage use of the GRM and clarify that this does not prevent affected persons from pursuing any legal action, if they feel it is</li> </ul>                                                    | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>Project GRM</li> <li>GoN laws and regulations</li> </ul>                                                                                                                    | <p>EPC Contractor</p> <p>Include in EPC contract cost</p>                                | NEA PMU / PISC               |

| Activity/<br>Sub-<br>component | Impact / Issue                                                                | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Applicable<br>Project<br>Standards / Best<br>Practice                                                                                                                                                                        | Implementation<br>Responsibility                                                  | Monitoring<br>Responsibility |
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|                                |                                                                               | needed, and inform communities about the ADB Accountability Mechanism and their possibility to resort to it if any grievance is not resolved by the project level GRM.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | (Chapter 2 of IEE)                                                                                                                                                                                                           | Throughout construction                                                           |                              |
|                                | Worker GRM                                                                    | <ul style="list-style-type: none"> <li>GRM will be available to all workers for receiving and handling complaints about unfair treatment or unsafe living or working conditions, ensuring no coercion nor reprisal.</li> <li>Construction workers will be given access to register any grievances with the contractors or direct access to the NEA GRM Focal</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                              |                                                                                   |                              |
| TL and SS                      | Impact on air quality - Release of Dust, Exhaust Gases and Fugitive Emissions | <ul style="list-style-type: none"> <li>Emission sources (vehicles such as excavators) shall be positioned as far as is practical from sensitive receptors.</li> <li>Equipment and vehicles will be regularly maintained in accordance with the manufacturer's recommendations to maximize fuel efficiency and help minimize emissions; keep log of maintenance records.</li> <li>Use diesel fuel that has a low sulfur content, less than 0.1%</li> <li>Construction equipment and vehicles will meet national emissions standards.</li> <li>Hold valid emission certificates of all construction vehicles</li> <li>Belching of black smoke is prohibited.</li> <li>Limit engine idling to maximum 5 minutes.</li> <li>The open burning of wastes generated by project-related activities is strictly prohibited.</li> <li>Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery-powered equipment where practicable.</li> <li>Stack emissions of temporary diesel generator set or hot mix to comply with national emission standards with the stack height designed according to both national requirements and IFC EHS General Guidelines.</li> <li>Stationary emission sources (e.g., portable diesel generators, compressors, etc.) shall be positioned as far as is practical from sensitive receptors.</li> <li>Construction entrance/exit wash bays shall be provided to control sediment, dust, invasive species spread and avoid scattering of mud on the access roads</li> </ul> | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>IFC EHS Guidelines: Air Emissions and Ambient Air Quality (2007)</li> <li>GoN laws and regulations (Chapter 2 of IEE and Annex X of this document)</li> </ul> | EPC Contractor<br><br>Include in EPC contract cost<br><br>Throughout construction | NEA PMU / PISC               |

| Activity/<br>Sub-compone<br>nt | Impact / Issue | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Applicable<br>Project<br>Standards / Best<br>Practice | Implementation<br>Responsibility | Monitoring<br>Responsibility |
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|                                |                | <ul style="list-style-type: none"> <li>• Ensure an adequate supply of bowzers and carry out watering for dust control at least twice a day on the work site, more if needed, and within 500m of work sites in dry weather with temperatures of over 25°C, or in windy weather. Dust control measures will also be implemented on all access roads within 50m of receptors. Avoid overwatering as this may make the surrounding area muddy.</li> <li>• Vehicle movements will be restricted to defined access routes and demarcated working areas (unless in the event of an emergency). All internal roads and access roads to substations off the highway will be asphalt or concrete surfaced.</li> <li>• A strict speed limit of at most 20 km/hr will be enforced for construction vehicles.</li> <li>• A solid temporary fencing shall be installed around the boundary/works area to minimize the dispersion of dust, it will also function as a temporary acoustic noise fence to minimize the noise and visual impact.</li> <li>• Keep stockpiles of soil, aggregate and waste materials covered with canvas or tarpaulin when spoil heaps are not active to avoid suspension or dispersal of fine soil particles during windy days and to prevent disturbance by stray animals.</li> <li>• Earthwork operation will be suspended when the wind speed exceeds 20 km/h in areas within 500 m of any community.</li> <li>• Vehicles carrying fine aggregate materials will be sheeted with canvas or tarpaulin to help prevent dust blow and spillages.</li> <li>• Only use cutting, grinding, or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g., suitable local exhaust ventilation systems.</li> <li>• Undertake sequenced construction method and revegetate areas immediately construction activities are completed in one area rather than undertaking earthworks on all parts of the site to minimize the area of bare ground exposed at any one time.</li> <li>• Undertake weekly dust soiling checks of surfaces of adjacent properties during earthworks and help with cleaning of external surfaces of property if dust is evident.</li> </ul> |                                                       |                                  |                              |

| Activity/<br>Sub-<br>component | Impact / Issue            | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Applicable<br>Project<br>Standards / Best<br>Practice                                                                                                            | Implementation<br>Responsibility                                                  | Monitoring<br>Responsibility |
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|                                |                           | <ul style="list-style-type: none"> <li>If there is an increase in existing background air pollution or complaints are received contractor will be required to implement additional dust or noise mitigation e.g., barricading/isolating sources of dust, use of wheel wash etc.</li> <li>Provide workers with N95 dust masks to be worn when ambient conditions are dusty or when dust generating activities take place.</li> </ul>                                                                                                                                                                                        |                                                                                                                                                                  |                                                                                   |                              |
| TL and SS                      | Impact on Water resources | <ul style="list-style-type: none"> <li>Construction activities must not limit the availability of or restrict access to water sources (e.g., wells) used by local communities.</li> <li>Natural flow of waterbodies must not be obstructed or diverted to another direction.</li> <li>No works to be undertaken within 20m of the banks of waterbodies to avoid bank slippage and loss of soil that would increase the turbidity of water.</li> <li>Ensure that no construction materials or construction waste block existing drainage channels. Channels shall be kept open at all times to avoid disruption.</li> </ul> | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>GoN laws and regulations (Chapter 2 of IEE)</li> </ul>                                            | EPC Contractor<br><br>Include in EPC contract cost<br><br>Throughout construction | NEA PMU / PISC               |
|                                | Water pollution           | <ul style="list-style-type: none"> <li>Follow liquid management and storage requirements listed below under 'soils'</li> <li>No untreated wastewater will be discharged direct to surface waterbodies or groundwater.</li> <li>All wastewater to be connected to existing sewerage system or septic tank with soak away, septic tank/soakaway effluent to meet national general wastewater standards or IFC wastewater discharge limits, whatever is the most stringent given the receiving source.</li> </ul>                                                                                                             | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>IFC EHS Guidelines: Hazardous Materials Management (2007)</li> <li>IFC EHS Guidelines:</li> </ul> | EPC Contractor<br><br>Include in EPC contract cost<br><br>Throughout construction | NEA PMU / PISC               |

| Activity/<br>Sub-compone<br>nt | Impact / Issue                                   | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Applicable<br>Project<br>Standards / Best<br>Practice                                                         | Implementation<br>Responsibility                                                         | Monitoring<br>Responsibility |
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|                                |                                                  | <ul style="list-style-type: none"> <li>Self-enclosed portable toilets may be used where the wastewater generated is enclosed in a container and will later be taken offsite to a municipal sewage treatment plant for wastewater treatment and disposal.</li> <li>Use of pit latrines is prohibited as is open defecation and urination and uncivil use of roads or private premises by construction workers.</li> <li>Treated wastewater will be used for damping down earthworks and road surfaces to mitigate dust generation.</li> <li>Construction site camps will be located at least 50m from water courses.</li> <li>Ensure no hazardous materials are placed where there could be spill or leak into surface water.</li> <li>Locate mobile generators and site construction equipment at least 50m from groundwater resources and surface waters.</li> <li>Discharge of sediment laden surface water runoff directly into surface water forbidden. Construction of sedimentation ponds is required to allow sediment to settle out of surface water runoff before release of water into the downstream environment. Sedimentation ponds for treating surface water runoff to be adequately sized for the volume of runoff, contractor to provide design calculations for approval.</li> <li>Dumping of construction waste including excess spoil and concrete sludge into streams and drains will be prohibited to minimize siltation.</li> <li>Provide spill prevent kits (sorberent pads, loose sorberent material etc.) at storage areas and other at-risk locations within clearly labelled containers.</li> </ul> | Wastewater and ambient water quality GoN laws and regulations (Chapter 2 of IEE and Annex X of this document) |                                                                                          |                              |
| TL and SS                      | Soil compaction, topsoil and excavated materials | <ul style="list-style-type: none"> <li>Avoid compaction impacts outside the cleared areas i.e., vehicle movements will be restricted to working areas. In wet conditions minimize use of heavy machinery and consider temporary installation of removable steel plates to protect soil and vegetation.</li> <li>Minimize removal of existing vegetation and topsoil. Topsoil disturbed will be separately stored and used to restore the surface of the excavated area.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>IFC EHS General Guidelines</li> </ul>          | <p>EPC Contractor</p> <p>Include in EPC contract cost</p> <p>Throughout construction</p> | NEA PMU / PISC               |

| Activity/<br>Sub-<br>component | Impact / Issue | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Applicable<br>Project<br>Standards / Best<br>Practice                                         | Implementation<br>Responsibility | Monitoring<br>Responsibility |
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|                                |                | <ul style="list-style-type: none"> <li>On completion of works, stockpiled topsoil will be spread over the surface of disturbed areas (if not under hard surfaces) and used in the restoration of temporary construction facilities. Once the topsoil has been replaced it will be stone picked to remove any large stones which are not in keeping with the surrounding soil texture.</li> <li>Revegetation of the soils will follow using native seed mixes to Nepal and the project area.</li> <li>Records of excavated soil, generated waste, and transfer records will be kept.</li> <li>If topsoil is stored for more than six months, the stacks will be monitored for anaerobic conditions and manual aeration will be undertaken if they develop.</li> <li>Stored subsoil and topsoil will be segregated in a manner that avoids mixing.</li> <li>Topsoil stacks will be free draining. Topsoil will be stored outside the running track used by construction plant, equipment and vehicles.</li> <li>Soil storage areas will be protected from vehicle movements to avoid soil compaction.</li> <li>Excavation will be limited to within the agreed corridor of impact.</li> <li>Infertile and rocky material will where possible be reused as fill material around foundations. If it needs to be taken off site, it will be disposed of by licensed waste management operator at designated disposal area suitable for accepting inert wastes. No spoil shall be removed from site until the disposal locations have been approved by NEA.</li> <li>Under no circumstances will excess materials be dumped on private lands, dumped or pushed into any river, stream or drain at any location.</li> <li>Upon completion of subsoil and topsoil reinstatement, disturbed areas will be inspected jointly for signs of erosion, slope instability, topographic diversity, surface water drainage capacity and function, and compaction with the contractor implementing remedial measures where required.</li> </ul> | <ul style="list-style-type: none"> <li>GoN laws and regulations (Chapter 2 of IEE)</li> </ul> |                                  |                              |

| Activity/<br>Sub-<br>component | Impact / Issue | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Applicable<br>Project<br>Standards / Best<br>Practice | Implementation<br>Responsibility                                                         | Monitoring<br>Responsibility |
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|                                | Soil erosion   | <ul style="list-style-type: none"> <li>Schedule works during the dry season where practical to minimize any exposed areas subject to erosion by surface water runoff.</li> <li>Temporary erosion control measures will be developed and implemented after initial land disturbance and if construction activity on the working areas is suspended over the wet season before full reinstatement of the site has been completed.</li> <li>Rehabilitate any disturbed areas beyond footprint of the substation infrastructure footprint to at least original condition through revegetation using native species.</li> <li>Slope stability measures to be implemented during construction to minimize landslide risk.</li> <li>Temporary access tracks will be graded and sloped to prevent unnecessary flow of water across them and to minimize soil erosion.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                       |                                                       | <p>EPC Contractor</p> <p>Include in EPC contract cost</p> <p>Throughout construction</p> | NEA PMU / PISC               |
|                                | Soil Pollution | <ul style="list-style-type: none"> <li>Fuel, oil, and chemicals used to be kept under lock and key and stored in labelled, sealed containers on drip trays to provide secondary containment. They will be located on an impermeable surface and be under cover. This will be located at least 50m from any surface water course or seasonal water channel.</li> <li>Mount plant containing oil and diesel on drip trays to catch leaks.</li> <li>Refuelling operations, equipment servicing and washdown to take place on an impermeable surface at least 50m from watercourses, springs and wells, with drainage directed through oil and grease interceptors before being discharged into a settling pond prior to discharge offsite.</li> <li>Regular inspections and maintenance will be carried out of secondary containment areas to confirm that they are functioning effectively.</li> <li>Provide sufficient absorbent materials (e.g., sorbents, dry sand, sandbags) on-site for soaking up fuel, oil or chemical leaks/spills.</li> <li>Spill response equipment (absorbents etc.) will be available in hazardous materials storage areas.</li> <li>All material safety data sheets (MSDS) are kept on site with the relevant materials.</li> </ul> |                                                       | <p>EPC Contractor</p> <p>Include in EPC contract cost</p> <p>Throughout construction</p> | NEA PMU / PISC               |

| Activity/<br>Sub-compone<br>nt | Impact / Issue    | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Applicable<br>Project<br>Standards / Best<br>Practice                                                                                                     | Implementation<br>Responsibility                                                  | Monitoring<br>Responsibility |
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|                                |                   | <ul style="list-style-type: none"> <li>Materials that can potentially react with each other will be segregated during storage.</li> <li>Hazardous chemicals will be securely stored on site in a designated storage area.</li> <li>Relevant personnel will be trained in safe use and handling of hazardous materials.</li> <li>Relevant construction personnel will be trained in use of spill kits and disposal practices.</li> <li>Vehicles delivering fuel or hazardous liquids will carry appropriate spill kits to allow an initial response to any spill to be deployed.</li> <li>All mobile plant (excluding vehicles) will be integrally bunded or will be equipped with a bund or drip tray which will be regularly inspected and emptied to prevent rainwater accumulating.</li> </ul> |                                                                                                                                                           |                                                                                   |                              |
|                                | Contaminated Land | <ul style="list-style-type: none"> <li>Any soils within work sites that appear to be contaminated by leaked oil or fuel shall be removed and disposed of as hazardous waste</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                           | EPC Contractor<br><br>Include in EPC contract cost<br><br>Throughout construction | NEA PMU / PISC               |
| TI and SS: Biodiversity        | Project footprint | <ul style="list-style-type: none"> <li>Temporarily disturbed areas will be revegetated on completion of construction, and the entire site will be maintained free of invasive species.</li> <li>Ground cover vegetation and trees to be retained where it is not needed to facilitate construction.</li> <li>Demarcation of the working areas and avoid encroachment outside these areas.</li> <li>Cut trees and cleared vegetation will be immediately removed off site.</li> <li>Promptly revegetate disturbed areas on completion of works with plant species native to district.</li> <li>All unanticipated damage to vegetation will be restored to pre-project condition and/or compensated at the cost of the contractor in line with the entitlement matrix.</li> </ul>                   | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>IFC EHS General Guidelines</li> <li>GoN laws and regulations (Chapter 2 of IEE)</li> </ul> | EPC Contractor<br><br>Include in EPC contract cost<br><br>Throughout construction | NEA PMU / PISC               |

| Activity/<br>Sub-<br>component | Impact / Issue             | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Applicable<br>Project<br>Standards / Best<br>Practice | Implementation<br>Responsibility | Monitoring<br>Responsibility |
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|                                | Vegetation                 | <ul style="list-style-type: none"> <li>Trees and vegetation to be cleared outside the breeding bird season, unless access to the substation site is limited due to seasonal weather conditions</li> <li>Before cutting or trimming trees ecologist to check for presence of nesting birds or roosting bats.</li> <li>On-site check for ground nesting birds by experienced ecologist prior to vegetation clearance if conducted during the bird breeding season.</li> <li>If nesting birds are found present, work will not take place until the adult birds and young have left the nest. Meanwhile a suitably sized protection zone will be clearly marked around the nest site by the ecologist to prevent any accidental disturbance or damage.</li> <li>Prior to earthworks, area will be checked by an ecologist for any signs of burrows etc. If occupied work will not take place in that area during the breeding season. Meanwhile a suitably sized protection zone will be clearly marked around the nest site by the ecologist to prevent any accidental disturbance or damage. Outside the breeding season only manual digging under close supervision of the ecologist permitted.</li> <li>No works from 1 hour before sunset to 1 hour after sunrise to avoid disturbance to fauna.</li> <li>No fauna to be injured by work, conduct walkover at start of each day to give fauna the chance to move on. Direct intervention by ecologist if need to relocate fauna outside the works area before start of work.</li> <li>Excavated pits will be robustly fenced or covered to prevent fauna accidentally falling in, further an escape ramp will be provided to allow their escape.</li> <li>Keep written record, supported by photographs of any animal relocations or casualties, including a cause of death if known.</li> <li>Follow the wildlife identification and rescue protocol.</li> </ul> |                                                       |                                  |                              |
|                                | Disturbance to<br>Wildlife | <ul style="list-style-type: none"> <li>Works at all sites within 500m of areas of high biodiversity value (BZ/KBA/IBA) and in or within 500m of areas supporting</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                       |                                  |                              |

| Activity/<br>Sub-<br>component | Impact / Issue | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Applicable<br>Project<br>Standards / Best<br>Practice | Implementation<br>Responsibility | Monitoring<br>Responsibility |
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|                                |                | <p>community forest or natural habitat will only be carried out under ecological supervision to minimize disturbance.</p> <ul style="list-style-type: none"> <li>• Use existing access roads to access work sites, in areas where access is restricted use manual labor to transport, install and string the TL to minimize the need to construct new access tracks</li> <li>• Demarcate the working area and avoid encroachment outside the working area.</li> <li>• Demarcate mature trees, or other trees to be avoided.</li> <li>• Only fell marked trees within the safety clearances (working area)</li> <li>• Follow design drawings and implement careful construction practices to avoid damage to vegetation outside the working area.</li> <li>• Contractor to provide firefighting equipment at work site with compulsory basic fire training for all workers and training drills undertaken in case of forest fire; in case of incident act swiftly to avoid fire spread.</li> <li>• Strict prohibition on workers to enter forest or natural habitat outside the working area, and on the purchase, sale and use of firewood, timber, NTFPs, hunting and poaching of fauna by workers.</li> <li>• Contractor to undertake regular, compulsory awareness raising activities for all workers related to prohibitions including toolbox talks and posting information and warning signs at site officers, accommodation, patrols by security guards employed by the contractor, regular inspections of accommodation, and disciplinary procedures for any contravention by workers etc.</li> <li>• Provide a good standard of worker accommodation with heating and meals to help discourage breaches of prohibition by workers.</li> <li>• Contractor to provide alternative fuel source (LPG) which will be stored in safe conditions in communal kitchen and for heating of accommodation.</li> </ul> |                                                       |                                  |                              |

| Activity/<br>Sub-<br>component         | Impact / Issue                                         | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Applicable<br>Project<br>Standards / Best<br>Practice                                                                                                                                                                            | Implementation<br>Responsibility                                                                                                                                                  | Monitoring<br>Responsibility |
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|                                        | Invasive species                                       | <ul style="list-style-type: none"> <li>Removal and disposal of identified plant species in an ecologically sound manner.</li> <li>Use wash stations at site entrance to pressure wash vehicles, plant and equipment before import to site and as needed on leaving site to minimize accidental spread.</li> <li>Imported materials must be free of invasive plant species.</li> <li>Use of herbicides or burning to clear vegetation is strictly prohibited.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                  |                                                                                                                                                                                   |                              |
| TL and SS<br>Land Use                  | Damage to Property or cause detriment or inconvenience | <ul style="list-style-type: none"> <li>Condition surveys of access roads and adjacent properties to be completed before project commences.</li> <li>Construction work will make effort to cause as little damage to property or cause detriment and inconvenience. If caused, NEA shall make full compensation.</li> <li>All unanticipated damage to existing public and private property outside the site boundary shall be restored to pre-project condition and/or compensated at the cost of the contractor in line with the LARP entitlement matrix.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                  | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>Project LARP</li> </ul>                                                                                                                                           | <p>EPC Contractor</p> <p>Include in EPC contract cost</p> <p>Throughout construction</p>                                                                                          | NEA PMU / PISC               |
| TL and SS<br>- Waste<br>Managem<br>ent | General impacts                                        | <ul style="list-style-type: none"> <li>Excess fill from excavation works across the site to be balanced with fill.</li> <li>Provide adequate facilities for handling and storage of construction materials to reduce the amount of waste that is caused by damage or exposure to the elements and a system for the collection/storage of wastes generated.</li> <li>Any plant or equipment that is rejected during the installation and commissioning due to damage or failure to immediately be removed from the site and returned to the supplier.</li> <li>Ensure that the waste hierarchy is followed including prevention, minimization, reuse and recycling -- maximum reuse and recycling of waste and timely removal of unusable waste according to national waste management regulations.</li> <li>Restrict use of plastics and polyethene and use recyclable/biodegradable materials during construction to the extent possible.</li> </ul> | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>IFC EHS Guidelines: Waste Management (2007)</li> <li>IFC EHS Guidelines: Contaminated Land (2007)</li> <li>GoN laws and regulations (Chapter 2 of IEE)</li> </ul> | <p>EPC Contractor</p> <p>Include in EPC contract cost</p> <p>Throughout construction</p> <p>EPC Contractor</p> <p>Include in EPC contract cost</p> <p>Throughout construction</p> | NEA PMU / PISC               |

| Activity/<br>Sub-<br>component | Impact / Issue           | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Applicable<br>Project<br>Standards / Best<br>Practice | Implementation<br>Responsibility                   | Monitoring<br>Responsibility |
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|                                |                          | <ul style="list-style-type: none"> <li>In locations where waste is dumped (existing site conditions) the contractor will clean the site and collect the waste for onward disposal before they commence their works.</li> <li>Ensure sufficiently sized facilities are provided for the environmentally safe and sound collection, segregation and storage of waste (including from overnight accommodation) on-site, maximum reuse and recycling of waste by reputable, legitimate, licensed third parties and timely removal and safe transportation of unusable waste to a suitably licensed and engineered waste management facility with all waste transfer records retained. Keep copies of the waste management company's licenses on file. Document all volumes and types of wastes generated and removed off site (inert, solid, hazardous) using transfer</li> <li>Leaving or disposing of construction wastes by burying them on-site or disposing of them at unlicensed waste management facilities is strictly prohibited.</li> <li>Unsanitary open dumps are not to be used by the contractor or their third parties.</li> <li>Municipal waste collection systems must not be used as this is likely to mean that the waste is open dumped, arrangements should be made for direct disposal to a suitably licensed and engineered waste management facility with all waste transfer records retained.</li> <li>Burning of waste on-site is also strictly prohibited.</li> <li>No construction material or waste to be poured or thrown into drains</li> <li>Provide regular training of staff in waste management issues.</li> <li>All recyclable waste (plastic, metal, paper, etc.) will be sorted on source and sent for recycling where facilities for recycling of these materials exist.</li> </ul> |                                                       |                                                    |                              |
|                                | Domestic and Inert Waste | <ul style="list-style-type: none"> <li>No domestic waste shall be left at work sites.</li> <li>Any spoil material from tower or substation foundations will be removed from the site and sent to an appropriate state licensed waste management facility.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                       | EPC Contractor<br><br>Include in EPC contract cost | NEA PMU / PISC               |

| Activity/<br>Sub-<br>component | Impact / Issue  | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Applicable<br>Project<br>Standards / Best<br>Practice | Implementation<br>Responsibility                                                  | Monitoring<br>Responsibility |
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|                                |                 | <ul style="list-style-type: none"> <li>Ensure that wastes are not haphazardly dumped within the work sites and adjacent areas</li> </ul>                                                                                                                                                                                                                                                                                                                                                |                                                       | Throughout construction                                                           |                              |
|                                | Hazardous Waste | <ul style="list-style-type: none"> <li>Use containers suitable for each type of waste.</li> <li>Mark containers adequately specifying the waste types.</li> <li>Do not mix various waste streams.</li> <li>Remove waste at the completion of the work day and return it for storage at the appropriate Contractor facility before final disposal via a licensed contractor for hazardous waste removal and keep agreements with hazardous waste management company's active.</li> </ul> |                                                       | EPC Contractor<br><br>Include in EPC contract cost<br><br>Throughout construction | NEA PMU / PISC               |
|                                | Waste Tracking  | <ul style="list-style-type: none"> <li>Keep copies of waste manifests on site.</li> <li>Keep a record of waste on-site and waste removed.</li> </ul>                                                                                                                                                                                                                                                                                                                                    |                                                       | EPC Contractor<br><br>Include in EPC contract cost<br><br>Throughout construction | NEA PMU / PISC               |

| Activity/<br>Sub-<br>component | Impact / Issue                      | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Applicable<br>Project<br>Standards / Best<br>Practice                                                                                                                                                                                                                          | Implementation<br>Responsibility                                                                   | Monitoring<br>Responsibility |
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| TL and SS                      | Elevated noise levels and vibration | <ul style="list-style-type: none"> <li>Equipment and vehicles will be regularly maintained in accordance with the manufacturer's recommendations to help minimize noise emissions.</li> <li>Only well-maintained modern equipment conforming with noise standards will be used at site.</li> <li>Contractor to use suitably designed mufflers or sound reduction equipment on breakers/drills and ensure all leaks in the air line are sealed on them.</li> <li>Work will be undertaken in daytime hours only – in accordance with IFC EHS definitions (7am – 10pm).</li> <li>Unless in remote locations away from population installation works in the public domain and interacting with public roads or footpaths during 7am -10am as children are going to school and 3pm-5pm as they return back are to be avoided, especially near narrow roads where no safe alternative/diversion route is available for them.</li> <li>If the works need to be undertaken during this time then a safe and signed pedestrian diversion route must be put in place with a pedestrian marshal to ensure that children do not go near the working area and a flag man to control traffic if required to ensure children are not put at increased risk.</li> <li>Noisy construction activity at substations (especially earthworks) only between the hours of 8 am - 6 pm except where no receptors in 500m.</li> <li>Noise generating construction-related activities will be avoided during evenings, school hours, exam periods, prayer times, religious or cultural events near the sensitive receptors (within 500m).</li> <li>No works on Sundays, holidays or festival days within 500m receptors.</li> <li>Sensitive receptors within 500m to be consulted with any other special days when they would wish noise levels to be minimized.</li> <li>Loud construction noise, breaking and drilling activities, must be limited to very short periods of activity adjacent to receptors to minimize disturbance.</li> </ul> | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>IFC EHS Guidelines – Noise Management (2007)</li> <li>IFC EHS Guidelines: Electrical Power and Distribution (2007)</li> <li>GoN laws and regulations (Chapter 2 of IEE and Annex X of this document)</li> </ul> | <p>EPC Contractor</p> <p>Include in EPC contract cost</p> <p>Throughout project implementation</p> | NEA PMU / PISC               |

| Activity/<br>Sub-<br>component | Impact / Issue | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Applicable<br>Project<br>Standards / Best<br>Practice | Implementation<br>Responsibility | Monitoring<br>Responsibility |
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|                                |                | <ul style="list-style-type: none"> <li>On the boundary of the substation construction noise will be limited to 1- hour LAeq 70 dB(A).</li> <li>Construction noise experienced at rural residences must be limited to 45dB(A), other residences to 55dB(A), commercial buildings 65dB(A), and quiet areas 50dB(A) as 1hour LAeq – if nighttime work is permitted it must be limited to 40dBA in rural residences and quiet areas, 45dBA at other residences and 55dB(A) at commercial buildings as 1hour LAeq</li> <li>If these noise levels are exceeded, or background levels &gt;3dBA were already exceeded, the contractor will be required to implement additional noise mitigation measures such as adjusting working methods or placing of temporary noise barriers to ensure the noise standard is met.</li> <li>No piling or blasting is to be undertaken for construction unless a piling/blasting management plan has been agreed. Any rock removal will be undertaken using pneumatic hammer (handheld or excavator mounted).</li> <li>Use low noise generating equipment e.g., less than 55dBA sound pressure level at 1m.</li> <li>The use of horns in areas where sensitive receptors are located (houses, schools, clinics, temples, etc.) will be prohibited.</li> <li>Residents within 500m of substations will be forewarned of planned activities that are considered by the Project to be noisy (e.g., trench excavation / drilling).</li> <li>If complaints are received from the local population regarding elevated noise levels, temporary noise screens shall be installed around the work site, shielding the identified receptors from the source of noise. In the event of a grievance being received carry out an investigation of noise levels to determine whether they will comply with permitted maximum levels using a hand held noise monitor mounted on a tripod to measure IEC A-weighting dB(A) LAeq.</li> <li>Construction workers exposure to noise should not exceed the levels set out in the General EHS Guidelines on Occupational Health and Safety otherwise the hearing protection is to be</li> </ul> |                                                       |                                  |                              |

| Activity/<br>Sub-<br>component | Impact / Issue                                      | Mitigation Measures                                                                                                                                                                                              | Applicable<br>Project<br>Standards / Best<br>Practice                                                                 | Implementation<br>Responsibility                                                  | Monitoring<br>Responsibility |
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|                                |                                                     | provided e.g., 85 dB(A) during continuation of 8 working hours without wearing PPE.                                                                                                                              |                                                                                                                       |                                                                                   |                              |
| TL and SS                      | Damage to Physical Cultural Resources, Chance Finds | <ul style="list-style-type: none"> <li>Implement the chance find procedure, if required.</li> </ul>                                                                                                              | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>GoN laws and regulations (Chapter 2 of IEE)</li> </ul> | EPC Contractor<br><br>Include in EPC contract cost<br><br>Throughout construction | NEA PMU / PISC               |
| TL and SS                      | Outages, damage to utilities and                    | <ul style="list-style-type: none"> <li>All unanticipated damage to existing public utilities shall be restored immediately to pre-project condition and/or compensated at the cost of the contractor.</li> </ul> | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> </ul>                                                      | EPC Contractor<br><br>Include in EPC contract cost                                | NEA PMU / PISC               |

| Activity/<br>Sub-<br>compone<br>nt | Impact / Issue      | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                | Applicable<br>Project<br>Standards / Best<br>Practice                                         | Implementation<br>Responsibility | Monitoring<br>Responsibility |
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|                                    | private<br>property | <ul style="list-style-type: none"> <li>If existing structures (e.g., buildings) and roads, tracks, crops, or, canals, or drains are damaged by works, the Contractor will be required to rehabilitate them to at least their condition prior to construction works to the satisfaction of the property owner having reference to pre-condition surveys.</li> </ul> | <ul style="list-style-type: none"> <li>GoN laws and regulations (Chapter 2 of IEE)</li> </ul> | Throughout<br>construction       |                              |

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| TL and SS | Occupational Health and Safety General | <ul style="list-style-type: none"> <li>For all construction works comply with GoN rules and regulations for the protection of workers.</li> <li>Strictly implement all the measures outlined in annexes and all the measures outlined below.</li> <li>Emergency contact number and details for medical, fire, etc. are to be displayed in all construction sites.</li> <li>No unaccompanied members of the public shall be allowed on the construction site.</li> <li>In the event of any fatality occurring during the construction phase at any work site, provide NEA with the details of the fatality within one day (24 hours) of the event occurring in a Fatality Report (for onward reporting to ADB within 48 hours) and provide within 48 hours an incident report with corrective action detailing how reoccurrence will be prevented.</li> <li>Contractor is responsible for ensuring H&amp;S of everyone on construction site including visitors and sub-contractor workers regardless they have been formally or informally employed.</li> <li>Ensure adequate health and safety supervision is always on site (if staff temporarily off sick or on short term leave of less than a fortnight contractor to provide a named alternate in advance; if safeguard staff are on longer term leave, are posted elsewhere, or resign, contractor to ensure replacement CV is submitted to NEA in seven days of the contractor becoming aware with the staff joining the site within one month).</li> <li>Construction plant and equipment used will be modern and fitted with appropriate safety devices.</li> <li>Temporary safety fences shall be erected around each work site.</li> <li>Require workers to confirm they have seen and understood the requirements of the OHS plan before proceeding with the work.</li> <li>Warning signs will be displayed around work sites to warn workers and members of the local community of potential risks in Hindi and other languages of the workers found on site.</li> <li>MSDS are to be readily available to any exposed workers and the first-aid personnel.</li> <li>All crews shall have a competent person responsible for first aid.</li> <li>Only allow suitably trained and qualified workers to be allowed to work on electrical equipment and at height, these workers must have training record of attending suitable training course on electrical safety and working at height and have a recent medical checkup to confirm they are fit for work.</li> <li>Require other workers to observe the distances for excavations, tools, vehicle activities when working around power lines</li> <li>Provide personal protective equipment (PPEs) for workers in accordance with national OHS regulations and good international industry practice</li> </ul> | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>IFC EHS Guidelines General</li> <li>IFC EHS Guidelines: Electrical Power Transmission and Distribution (2007)</li> <li>ILO safety and health in construction</li> <li>ILO Convention - Minimum Age Convention (1973)</li> <li>ILO Convention - Worst Forms of Child Labour Convention (1999)</li> <li>ILO Convention – Forced Labour</li> <li>ILO safety and health in construction/worker accommodation guidelines</li> <li>World Bank Guidance Note on Managing Labor Influx, 2016</li> <li>GoN laws and regulations</li> </ul> | EPC Contractor<br><br>Include in EPC contract cost<br><br>Throughout construction | NEA PMU / PISC |
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| TL and SS | Community Health and Safety Grievances | <ul style="list-style-type: none"> <li>• Implement the GRM procedures to provide opportunity for residents to raise concerns.</li> <li>• Provide 72 hours advance notice of any works (not including emergency works) to the local community.</li> <li>• Robustly fence and sign immediate working area including stores/stockpiles with security presence to prevent public access during construction works.</li> <li>• Provide robust barricade/fence, hazard warning signage, and security presence whilst working in areas accessible to the public.</li> <li>• Do not allow children to play in or adjacent to the construction site</li> <li>• Do not leave hazardous conditions (e.g., unlit open excavations without means of escape) overnight unless no access from the public can be ensured.</li> <li>• Prevent standing water as it may become a breeding habitat for mosquitoes etc.</li> <li>• Construction site will be labelled / signposted in accordance with national regulations and GIIP to inform the public of the specific safety risks.</li> <li>• All work sites will be appropriately signposted and isolated (through fencing or bunting) to prevent encroachment into these areas. Where there are open excavations then solid fencing barrier must be used.</li> <li>• Safety scaffolds and safety nets will be used to protect pedestrians and vehicles (and the conductor itself) from potential injury/damage during conductor stringing – this will be used wherever stringing of OHL conductor crosses over roads, waterbodies, or nearby settlement presenting a possible risk to local communities.</li> <li>• Cut vegetation, excavated soil, poles and conductors, and other equipment will need to be stored outside of habitation, not block access or road use.</li> <li>• Contractors will be required to ensure that safe access ways to public and private amenities (including schools, public health centers, places of worship (temples) etc.) are maintained throughout the construction period.</li> <li>• In the urban areas and narrow roads transport equipment only during non-rush hours i.e., avoid the hours of 7 am to 10 am and 3 pm to 5 pm with the timing of works planned (taking in consideration school timings - going and coming back) in</li> </ul> | <ul style="list-style-type: none"> <li>• ADB SPS (2009)</li> <li>• Project GRM</li> <li>• IFC EHS Guidelines: Community Health and Safety (2007)</li> <li>• Voluntary Principles on Security and Human Rights<sup>6</sup></li> <li>• GoN laws and regulations (Chapter 2 of IEE)</li> </ul> | EPC Contractor<br><br>Include in EPC contract cost<br><br>Throughout construction | NEA PMU / PISC |
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|  |  | <p>conjunction with other construction works to minimize the cumulative impacts they may cause traffic congestion.</p> <ul style="list-style-type: none"> <li>• In dense town areas or on busy roads or narrow roads installation works affecting roads to avoid rush hours (school timings) i.e., avoid the hours of 7am to 10 am and 3 pm to 5 pm</li> <li>• Stockpiling of materials, spoil, and any new equipment (cable reels etc.) only in designated areas where no access or road use (school gates) will be blocked.</li> <li>• Temporary pedestrian and traffic diversions are to be put in place per the approved traffic management plan. Diversion works to be immediately dismantled on completion of works and the footpath and roads restored to their original condition.</li> <li>• Ensure that safe access ways to public and private amenities (including schools) are maintained, safe alternative routes provided and clearly signed where there are temporary diversions or blockages.</li> <li>• Safety guides should be provided where works are on footpaths or in locations of pedestrian crossings to help guide pedestrians, especially vulnerable persons, safely around the working area.</li> <li>• Safe access to property, footpaths and roads should be maintained and safe alternative routes and access provided and clearly signed where there are temporary diversions or blockages.</li> <li>• Damage to roads must be immediately repaired to ensure that local communities can continue to safely use the public roads/highways.</li> <li>• On completion of construction works roads must be left by the contractors in no poorer condition than when construction started.</li> <li>• For congested and narrow roads trained and experienced flagmen should be utilized to warn road users of the situation.</li> <li>• Keep a specific record of any community incidents that occur during the construction phase. Report the numbers to NEA monthly.</li> <li>• The project will implement the 'Voluntary Principles on Security and Human Rights'</li> <li>• During construction, due diligence will be applied to selection of security providers, rules of engagement will be devised, and training provided to all personnel. Performance will be monitored and audited periodically.</li> <li>• Implement agreed traffic management plan. Safe access to</li> </ul> |  |  |  |
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|  |  | <p>property and roads should be maintained and alternative routes and access provided where there are temporary diversions or blockages. Diversion works to be immediately dismantled on completion of works and the footpath and roads restored to their original condition.</p> <ul style="list-style-type: none"> <li>• Transport equipment only during non-rush hours i.e., avoid the hours of 9am to 11 am and 4pm to 6 pm to minimize traffic congestion.</li> <li>• Stockpiling of spoil and any new equipment (conductor reels, etc.) shall be away from properties and only in designated areas where no access or road use will be blocked.</li> <li>• Allow for adequate traffic flow around construction areas via diversions or temporary access roads.</li> <li>• Provide adequate traffic signs, appropriate lighting, well-designed traffic safety signs, barriers, and flag persons for traffic control.</li> <li>• Ensure that safe access ways to public and private amenities (including schools) are maintained, safe alternative routes provided and clearly signed where there are temporary diversions or blockages.</li> <li>• Traffic management will need to be done in consultation with the affected communities to ensure they are aware of likely disruption.</li> <li>• Implement traffic management controls during construction works with advance warning signs or flag persons to ensure health and safety of construction workers and road users.</li> <li>• Construction traffic warning signs will be positioned at road crossings and other appropriate locations as determined by the project, for example, along access routes before they are used by construction traffic.</li> <li>• Road safety and warning signs must be posted at 500m, 100m, and immediately in advance of the site entrance at least two days prior to the works commencing to inform the public of the temporary hazard of turning traffic.</li> <li>• For site entrances flagmen should be utilized to warn road users of the situation.</li> </ul> |  |  |  |
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| Activity/<br>Sub-<br>component | Impact / Issue                        | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Applicable<br>Project<br>Standards / Best<br>Practice              | Implementation<br>Responsibility | Monitoring<br>Responsibility |
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| TL and SS                      | Training and<br>Capacity<br>Buildings | <ul style="list-style-type: none"> <li>• Conduct bi-monthly training of workers on pollution prevent control including good housekeeping and how to clean up oil/fuel spills and dispose of contaminated sorbent material which would be treated as a hazardous waste.</li> <li>• Conduct weekly training on occupational health and safety for all construction workers including refreshers. To include training for subcontractors before commencement of works.</li> <li>• Conduct monthly training of workers on emergency preparedness and response procedures in case of an occupational or community health and safety incident during construction works. To include training for subcontractors before commencement of works.</li> <li>• Driver training, monthly, to include advice on behaviors to reduce the potential for disturbance, including use of horn, loud radios with windows open, switching engines off when not in use, strictly observing speed limits and not accelerating or braking aggressively.</li> </ul> | <ul style="list-style-type: none"> <li>• ADB SPS (2009)</li> </ul> | EPC Contractor                   | NEA PMU / PISC               |

| Activity/<br>Sub-<br>component | Impact / Issue                                | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Applicable<br>Project<br>Standards / Best<br>Practice                                 | Implementation<br>Responsibility | Monitoring<br>Responsibility |
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| TL and SS                      | GRM<br>Communication<br>and<br>Implementation | <ul style="list-style-type: none"> <li>Disseminate GRM contact details and arrangements to the community through the distribution of pamphlets, prominently posted notices at work sites, community centers etc.</li> <li>Ensure that throughout construction highly visible signage providing their and GRM Focals names and contact details are prominently displayed at all construction sites, storage areas, temporary worker camps, subproject site offices, road crossing points etc.</li> <li>To facilitate liaison with the local community the environment safeguards team will need to be supported by a member of staff who can speak the local language.</li> <li>Encourage affected persons to make use of the GRM yet clarify that this does not prevent them from pursuing legal action, if they feel that it is needed</li> <li>Keep a record of all grievances received and their resolution and to report on them.</li> </ul> | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>Project GRM</li> </ul> | EPC Contractor                   | NEA PMU / PISC               |

| Topic       | Activity / Issue               | Commitment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Applicable Project Standards Guidelines /                                                                                                                                            | Implementation Responsibility (Budget Source and Timing) | Monitoring Responsibility |
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| O&M         |                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                      |                                                          |                           |
| Substations | General impacts EHS during O&M | <ul style="list-style-type: none"><li>During the operational phase NEA will be responsible for ensuring that all required corrective actions for existing substations continue to be complied with per the Corrective Action Plan.</li><li>NEA to develop SOP for pollution control and health and safety management of substation operation and maintenance including inspections schedules etc. SOP to cover pollution control, solid and hazardous waste management, health and safety risk assessments and management plans addressing both occupational and community</li></ul> | <ul style="list-style-type: none"><li>ADB SPS (2009)</li><li>IFC EHS General Guidelines</li><li>IFC EHS Electric Power T&amp;D Guidelines</li><li>GoN laws and regulations</li></ul> | NEA O&M team<br><br>Throughout O&M phase                 | NEA PMU / PISC            |

| Topic | Activity / Issue | Commitment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Applicable Project Standards / Guidelines | Implementation Responsibility (Budget Source and Timing) | Monitoring Responsibility |
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|       |                  | <p>risks and including permit to work system of critical activities such as electrical or work at height and emergency preparedness and response provisions.</p> <ul style="list-style-type: none"> <li>• Implementation of SOP environment, health and safety measures, provision of regular EHS trainings to O&amp;M workers on SOP implementation and good housekeeping practices including how to clean up oil/fuel spills and dispose of contaminated sorbent material which would be treated as hazardous waste etc.</li> <li>• Continually improve compliance with national requirements and good international practice for EHS including health and safety and solid and hazardous materials and waste management in particular: <ul style="list-style-type: none"> <li>○ Undertake regular visual and technical inspection of condition of substation equipment and carry out maintenance as required, if SF6 or an oil leak encountered these are to be immediately addressed.</li> <li>○ Provide signage detailing NEA contacts in case of grievance.</li> <li>○ Provide at least one-month advance notice to local community about the schedule of and details of planned major maintenance works.</li> </ul> </li> <li>• Mitigation measures applicable to the construction stage are also applicable to the O&amp;M activities and workers.</li> <li>• During O&amp;M, internal audits will be undertaken by the NEA safeguards staff.</li> </ul> | (Chapter 2 of IEE)                        |                                                          |                           |

| Topic                      | Activity / Issue                                                   | Commitment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Applicable Project Standards Guidelines /                        | Implementation Responsibility (Budget Source and Timing) | Monitoring Responsibility |
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| Climate change/substations | Leakage of SF6 from any gas insulated equipment, especially at PSS | <ul style="list-style-type: none"> <li>Inventory to be maintained of all SF6 containing equipment at substation, their make and model, volume of SF6 contained, details of repair works undertaken, dates of SF6 replenishment, leakage incidents etc. Inventory to be used to monitor SF6 leakage. If trend of lowering gas pressure is observed investigate the cause and rectify any leak per the manufacturer's instruction.</li> <li>SF6 in fire extinguishers provided to be avoided.</li> <li>During operation, regular visual and technical inspections will be undertaken, SF6 leakage detection kits will be provided at each substation, and remote gas pressure alarms are to be installed where daily inspection is not an option, such that any leaks can be immediately addressed.</li> <li>NEA do not currently have procedures for safe disposal of SF6. Therefore, SOP must detail disposal at end-of-life.</li> <li>Ensure SF6 is first removed in accordance with International Electrotechnical Commission (IEC) standard 61634 to a very low pressure so losses of SF6 are less than 0.5% at end of life and then reused, recycled, or destroyed in a high-temperature incinerator.</li> <li>Training of all project and O&amp;M staff on the climate change impact of SF6, alternatives, H&amp;S risks during O&amp;M due to presence of toxic byproducts, leakage minimization, and environmentally sound and safe disposal.</li> </ul> | <ul style="list-style-type: none"> <li>ADB (2009) SPS</li> </ul> | NEA O&M team<br><br>Throughout O&M phase                 | NEA PMU / PISC            |

| Topic                                | Activity / Issue                | Commitment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Applicable Project Standards / Guidelines                                                                                 | Implementation Responsibility (Budget Source and Timing) | Monitoring Responsibility |
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| Soil and water pollution/substations | Transformers and oil management | <ul style="list-style-type: none"> <li>• Maintain inventory of transformers on site, make, model, transformer test report, details any maintenance works undertaken, dates oil changes, leakage incidents etc.</li> <li>• Maintain transformers and other noise generating equipment to meet operational noise standards.</li> <li>• Carry out regular inspections and periodic preventive maintenance to minimize oil leakages; ensure valves, nuts and bolts are fully functional and tightly secured, ensure rubber seals of radiators are intact</li> <li>• Maintenance of and handling of transformer oil to be carried out only by trained workers using appropriate PPE.</li> <li>• The acceptance of mineral oil to be accompanied with Material Safety Data Sheet and certification that it is PCB free.</li> <li>• Material Safety Data Sheets for all fuel/oil/chemical kept on site to be posted</li> <li>• Maintain spill management materials (sorbent pads, loose sorbent material, sand, etc.) next to storage areas for immediately soaking up any leaks or spills that do accidentally occur</li> <li>• Workers interacting with oil must wear suitable chemical and/or oil-resistant gloves, goggles, and protective clothing.</li> <li>• No untreated wastewater is to be discharged direct to surface water or the ground.</li> <li>• Restrict use of diesel generator to emergency power back-up to minimize air emissions.</li> <li>• Use of herbicides or burning to clear vegetation is strictly prohibited.</li> </ul> | <ul style="list-style-type: none"> <li>• ADB SPS (2009)</li> <li>• NEA laws and regulations (Chapter 2 of IEE)</li> </ul> | NEA O&M team<br><br>Throughout O&M phase                 | NEA PMU / PISC            |

| Topic                   | Activity / Issue     | Commitment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Applicable Project Standards Guidelines / | Implementation Responsibility (Budget Source and Timing) | Monitoring Responsibility |
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| Training/all components | OHS                  | <ul style="list-style-type: none"> <li>Ensure workers with a specific role have attended specialized health and safety trainings related that role e.g., health and safety stewards, first aiders, fire safety officers, as well as ensuring workers have received task-specific trainings for working with electricity, etc.</li> <li>Only allow suitably trained and qualified workers to work on electrical equipment these workers must have training record of attending suitable training course on electrical safety and working at height and be provided with and wear the appropriate PPE for their role.</li> <li>Untrained workers must not be permitted to work with live electricity.</li> </ul> | • ADB (2009) SPS                          | NEA O&M team<br><br>Throughout O&M phase                 | NEA PMU / PISC            |
|                         | Emergency Response   | <ul style="list-style-type: none"> <li>Conduct monthly training involving all workers on emergency preparedness and response procedures (drills) in case of an occupational or community health and safety incident during O&amp;M including fire, natural disaster, disease outbreak etc.</li> <li>Emergency preparedness and response training for operational management will include modules on first aid and fire safety including include training on how to use first aid and firefighting equipment provided on-site, and scenario of potential or confirmed infection.</li> </ul>                                                                                                                     | • ADB (2009) SPS                          | NEA O&M team<br><br>Throughout O&M phase                 | NEA PMU / PISC            |
|                         | Pollution Prevention | <ul style="list-style-type: none"> <li>Conduct bi-monthly training of workers on pollution prevent control including good housekeeping and how to clean up oil/fuel spills and dispose of contaminated sorbent material which would be treated as a hazardous waste.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                | • ADB (2009) SPS                          | NEA O&M team<br><br>Throughout O&M phase                 | NEA PMU / PISC            |

| Topic                         | Activity / Issue | Commitment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Applicable Project Standards / Guidelines                                                                                                                                                                                        | Implementation Responsibility (Budget Source and Timing) | Monitoring Responsibility |
|-------------------------------|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|---------------------------|
| Waste Management/ substations | General impacts  | <ul style="list-style-type: none"> <li>Collect and segregate all O&amp;M wastes including scrap metal, oil, and solid waste; ensure all workers are familiar with this segregation. Store all the wastes produced in an environmentally sound manner in designated, labelled area with separate waste containers (drums, bins, skips) for each type of waste with solid waste in enclosed bins to contain leachate and avoid vermin.</li> <li>Ensure that the waste hierarchy is followed including prevention, minimization, reuse and recycling -- maximum reuse and recycling of waste and timely removal of unusable waste according to national waste management regulations.</li> <li>Encourage recovery of recyclable wastes that could be reused or sold to recyclers, rather than disposing of it.</li> <li>Hazardous wastes (oily rags, etc.) must be disposed of using appropriately licensed waste management company.</li> <li>Ensure sufficiently sized facilities are provided for the environmentally safe and sound collection, segregation and storage of waste (including from overnight accommodation) on-site, maximum reuse and recycling of waste by reputable, legitimate, licensed third parties and timely removal and safe transportation of unusable waste to a suitably licensed and engineered waste management facility with all waste transfer records retained. Keep copies of the waste management company's licenses on file. Document all volumes and types of wastes generated and removed off site (inert, solid, hazardous) using transfer</li> </ul> | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>IFC EHS Guidelines: Waste Management (2007)</li> <li>IFC EHS Guidelines: Contaminated Land (2007)</li> <li>GoN laws and regulations (Chapter 2 of IEE)</li> </ul> | NEA<br><br>Throughout O&M phase                          | NEA PMU / PISC            |

| Topic                            | Activity / Issue | Commitment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Applicable Project Standards / Guidelines                                                                                                                                                                                                    | Implementation Responsibility (Budget Source and Timing) | Monitoring Responsibility |
|----------------------------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|---------------------------|
|                                  |                  | <ul style="list-style-type: none"> <li>Municipal waste collection systems must not be used as this is likely to mean that the waste is open dumped, arrangements should be made for direct disposal to a suitably licensed and engineered waste management facility with all waste transfer records retained. Since it is unlikely any will be available locally use waste management facilities (e.g. compost, incineration) included on-site during the design stage.</li> <li>Burning of waste on-site is also strictly prohibited, including vegetation.</li> <li>Removal and disposal of identified invasive plant species in an ecologically sound manner.</li> </ul>                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                              |                                                          |                           |
| Health and Safety/all components | General          | <ul style="list-style-type: none"> <li>NEA is responsible for ensuring H&amp;S of everyone on construction site including visitors and sub-contractor workers regardless they have been formally or informally employed.</li> <li>Strictly implement SOP and all health and safety measures in annex.</li> <li>Warning signs will be displayed around work sites to warn workers and members of the local community of potential risks.</li> <li>Maintain warning / advisory signs in good and visible condition.</li> <li>Emergency contact number and details for medical, fire, etc. are to be displayed at the site.</li> <li>For all maintenance works undertake risk assessment and prepare H&amp;S plan in accordance with EHS Guidelines, considering occupational and community H&amp;S and including adherence emergency preparedness and response plan with communication systems and protocols to report an emergency situation. Mitigation measures applicable to the</li> </ul> | <ul style="list-style-type: none"> <li>ADB SPS (2009)</li> <li>IFC EHS Guidelines General</li> <li>IFC EHS Guidelines: Electrical Power Transmission and Distribution (2007)</li> <li>GoN laws and regulations (Chapter 2 of IEE)</li> </ul> | NEA<br><br>Throughout O&M phase                          | NEA PMU / PISC            |

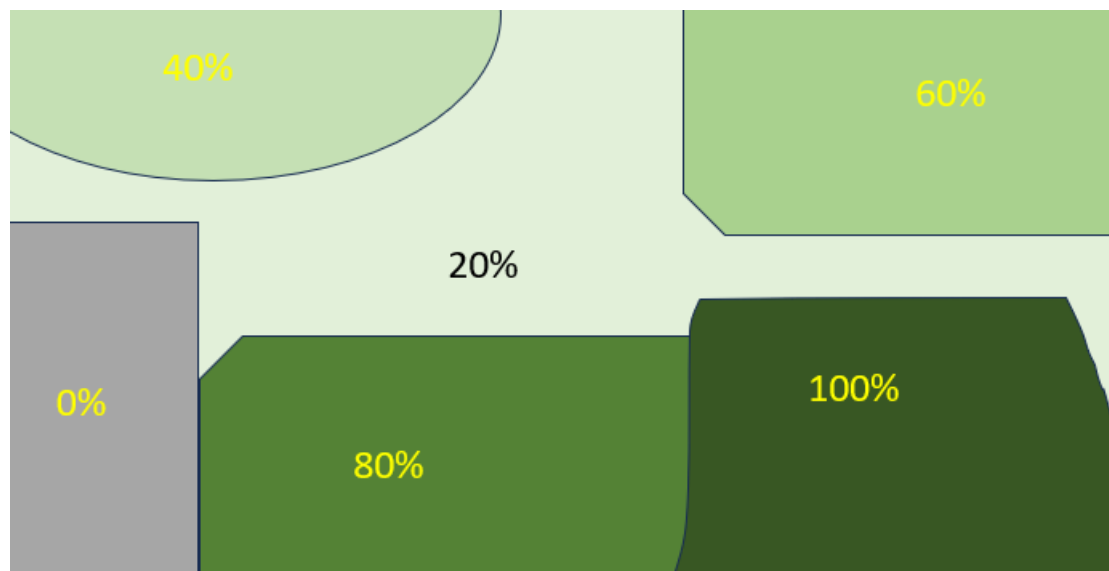
| Topic | Activity / Issue | Commitment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Applicable Project Standards Guidelines / | Implementation Responsibility (Budget Source and Timing) | Monitoring Responsibility |
|-------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|----------------------------------------------------------|---------------------------|
|       |                  | <p>construction stage are also applicable to O&amp;M activities.</p> <ul style="list-style-type: none"> <li>Enforce disciplinary system (e.g., immediate removal from site) for non-compliance with PPE requirements.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                           |                                                          |                           |
|       | OHS              | <ul style="list-style-type: none"> <li>Adequate supplies of potable drinking water meeting national standards should be provided to workers.</li> <li>Sanitation and welfare facilities to be regularly cleaned and disinfected.</li> <li>Handwashing facilities with clean running water supply and soap as well as hand sanitizers and closed bins for disposal of hygiene-related wastes to be provided on-site during works.</li> <li>Display posters to promote handwashing and respiratory hygiene etc.</li> <li>Arrange with nearest Health Center and/or Hospital for emergency cares of workers.</li> <li>Maintain incident logbook and medical tests / health check-up of staff</li> <li>Provide everyone who enters the substation with an OHS induction</li> <li>Only allow suitably trained and qualified workers to be allowed to work on electrical equipment and at height, these workers must have training record of attending suitable training course on electrical safety and working at height and have a recent medical check-up to confirm they are fit for work.</li> <li>Require other workers to observe the minimum approach distances.</li> <li>Provide personal protective equipment (PPEs) for workers in accordance with national OHS regulations and GIIP</li> </ul> |                                           |                                                          |                           |

| Topic | Activity / Issue | Commitment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Applicable Project Standards Guidelines / | Implementation Responsibility (Budget Source and Timing) | Monitoring Responsibility |
|-------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|----------------------------------------------------------|---------------------------|
|       |                  | <ul style="list-style-type: none"> <li>• Keep vents/windows unblocked and replace defunct bulbs/lights immediately</li> <li>• Ensure all substation workers receive basic first aid and firefighting training with annual refreshers</li> <li>• Ensure that at least one staff at substation is fully trained as a first aider and fire marshal</li> <li>• During O&amp;M works ensure qualified first aider and trained fire marshal is always available on-site with an appropriately equipped first aid kit and appropriate fire extinguisher and other firefighting equipment immediately available for use.</li> <li>• Maintain fully stocked, in-date first aid kit, keep first aid posters and emergency contact lists that are posted up to date</li> <li>• Maintain firefighting systems including in-date fire extinguishers and full sand buckets and keep fire safety posters up</li> <li>• Carry out regular inspections and periodic maintenance to ensure electrical standards are being upheld</li> <li>• Display clear emergency exits signs (in working order, if light signs, ensure they work) and keep exits clear of any blockages. Remove any trip hazards on the ground, e.g., materials, equipment, trash laying around.</li> <li>• Undertake regular pest control using integrated pest management approach</li> <li>• Maintain vegetation at the substation that poses a health and safety hazard</li> <li>• Cleaning of toilets on daily basis, use of disinfectant and floor cleaners; keep toilets/septic tank/soakaway maintained</li> </ul> |                                           |                                                          |                           |

| Topic | Activity / Issue | Commitment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Applicable Project Standards Guidelines / | Implementation Responsibility (Budget Source and Timing) | Monitoring Responsibility |
|-------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|----------------------------------------------------------|---------------------------|
|       |                  | <ul style="list-style-type: none"> <li>Measure exposure levels to electromagnetic fields (EMF) and provide workers working in zones where EMF levels are above reference levels with personal EMF monitoring device to be attached onto their PPE.</li> <li>Periodic spot monitoring using mobile phone app of noise levels and ambient EMF for substations at the boundary fence/near transformers to ensure they are below the occupational/community noise levels and ICNRP occupational/community EMF exposure levels</li> <li>Maintain security and prevent entry by the local community and livestock by maintaining adequate boundary fencing or wall, always keeping control room doors and gates shut, and having security persons present 24x7 to prevent unauthorized public access and trespass.</li> <li>NEA in conjunction with local municipalities, village heads, and the media with the support of CSOs to continue to organize health and safety campaigns on electrical safety community awareness raising activities in local communities and schools within 500 m of the substations</li> </ul> |                                           |                                                          |                           |
|       | Fatalities       | <ul style="list-style-type: none"> <li>In the event of any fatality occurring during the O&amp;M phase at any work site, provide PMU with the details of the fatality within one day (24 hours) of the event occurring in a Fatality Report (for onward reporting to ADB within 48 hours) and provide within 48 hours an incident report with corrective action detailing how reoccurrence will be prevented.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                           | NEA<br><br>Throughout O&M phase                          | NEA PMU / PISC            |

## MITIGATION PLAN ANNEX A: DETERMINATION OF FOREST HABITAT QUALITY

First, a preliminary map should be established using satellite imagery and/or aerial photography and/or existing land use-land cover maps. This map can then be refined using field data from surveys. These maps should distinguish between Modified and Natural Habitat within the ROW and identify the approximate condition of habitat. Figure 1 gives a generic example of a habitat condition map of a project area.



**Figure 1. Generic example of habitat condition map**

Table 7 gives a generic guide to how habitat condition could be classified, but the definitions would best be refined by the ecologist to be context-specific before surveys in agreement with NEA and ADB.

**Table 7. Generic habitat condition classification**

| Habitat condition | Condition in relation to 'perfect' habitat | Definition                                                                                                                           | Notes                                                                          |
|-------------------|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| Benchmark         | <b>100%</b> (90-100%)                      | Pristine habitat; the best quality of the type in the province                                                                       | Unlikely except in the most remote areas of province.                          |
| Good              | <b>80%</b> (70-90%)                        | Natural habitat which has been degraded in some way – e.g., selective logging, hunting, some clearings, and/or some invasive species | This can include natural grassland/shrub land areas where they occur.          |
| Moderate          | <b>60%</b> (50-70%)                        | More degraded natural habitat – e.g., with heavy logging, hunting, frequent clearings, and/or widespread invasive species            | This can include natural grassland/shrub land areas where they occur.          |
| Poor              | <b>40%</b> (30-50%)                        | Heavily degraded habitat, with major loss of native species                                                                          | Likely any lower altitude shrub land in the ROW                                |
| Very Poor         | <b>20%</b> (10-30%)                        | Habitat that has been substantially damaged by human factors                                                                         | Most likely areas of intensive cultivation, but possibly also some grasslands. |
| Absent            | <b>0%</b> (0-10%)                          | Habitat has been completely lost                                                                                                     | Only likely in already built-up areas (villages, roads, etc.)                  |

Assignment of specific habitats to condition classes should be based on a context-specific version of Table 2. For forest, it will usually be based on an overview of habitat structure, tree basal area, canopy cover, percentage of climax versus pioneer, and abundance of invasive species. In general, as habitat condition improves: the percentage of climax species increases versus pioneer species; the abundance of invasive species decreases; canopy cover increases; tree basal area increases (particularly for climax species); and habitat structure becomes more complex at first but then simplifies at good and benchmark condition.

An experienced ecologist with botanical knowledge will be able to see these changes collectively, but they are not easily identified through specific plot/quadrat/transect samples, which necessarily only take a very small sample.

#### Appendix 4: Biodiversity Management Plan and Mitigation Measures

| S.N.                                           | Impact                     | Biodiversity Features | Mitigation aim                            | Mitigation measure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Implementation Frequency         | Trigger for Implementation                                                                  | Responsibility | Means of Verification                                                                                                                                                           | Linked plans |
|------------------------------------------------|----------------------------|-----------------------|-------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|---------------------------------------------------------------------------------------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| <b>Pre-Construction and Construction Phase</b> |                            |                       |                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                  |                                                                                             |                |                                                                                                                                                                                 |              |
| <b>I</b>                                       | <b>Forest Destruction</b>  |                       |                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                  |                                                                                             |                |                                                                                                                                                                                 |              |
| <b>1</b>                                       | Impacts to forest habitats | Forest ecosystem      | Habitat protection or Forest conservation | <p>Map and confirm in writing the exact site limits for all construction sites including the access routes, storage areas and all other temporary facilities (e.g. publication of detailed plans).</p> <p>Catalogue and report the number of each species of tree that will be cleared to make way for the TL locations.</p> <p>Mark all trees to be cleared e.g. using tree tags.</p> <p>Obtain a permit for felling from the relevant government department if felling cannot be avoided.</p> <p>Complete all pre-construction measures (above actions) alongside representatives from the forest authority, community forest, leasehold forestry, and other relevant stakeholders.</p> <p>No works will take place to the trees until the above process has been completed.</p> | One time construction completion | Before any vegetation, clearance or tree felling activities begin at the construction site. | DKJTLP/DFO     | <p>Review of published report detailing results of tree enumeration for the right of way and all temporary facilities</p> <p>Review of relevant permits secured for felling</p> | Annex 1.1    |



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| S.N. | Impact         | Biodiversity Features | Mitigation aim                 | Mitigation measure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Implementation Frequency                                            | Trigger for Implementation                                                                                     | Responsibility                 | Means of Verification                                                                                    | Linked plans |
|------|----------------|-----------------------|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|--------------------------------|----------------------------------------------------------------------------------------------------------|--------------|
| 2    | Tree clearance | Forest ecosystem      | Felling and clearance of trees | <p>Mapping the exact site limits for all terrestrial sites including the access routes, storage areas and all other temporary facilities.</p> <p>Survey, map and publish details on:</p> <ul style="list-style-type: none"> <li>• habitats beneath towers and within the site limits including whether modified or natural habitat is present</li> <li>• quality of all forest cover within the site limits</li> <li>• the location, number, species of tree requiring felling/trimming/pollarding</li> <li>• the location of retained habitats and protective fencing</li> </ul> <p>Write and submit an ecological survey report alongside the design to detail the above information.</p> <p>Apply adaptive management measures to reduce impacts to habitats, species and trees as specified by the EPC Ecologist.</p> <p>Only commence works once the IES and ESMU have approved the reports and plans.</p> | Monthly to confirm compliance during construction                   | One-off upon completion of surveys and mapping, then monthly during construction to confirm ongoing compliance | EPC Contractor (EPC Ecologist) | Review of published report detailing results of survey for the right of way and all temporary facilities | Annex 1.1    |
|      |                |                       |                                | Collaborate with the local Divisional Forest Office, Community Forest User Groups, ensuring their involvement and expertise in the tree felling process.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Once during the planning phase before finalizing tree felling plans | Before finalizing any tree felling plans.                                                                      | EPC Contractor (EPC Ecologist) | Written records and photos of meetings with the DFO and CFUG                                             |              |



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| S.N. | Impact | Biodiversity Features | Mitigation aim | Mitigation measure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Implementation Frequency                                                                                   | Trigger for Implementation                                                                                       | Responsibility                        | Means of Verification                                                                                                                                                                | Linked plans |
|------|--------|-----------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
|      |        |                       |                | <p>Include any feedback within the above plans and report prior to finalizing plans.</p> <p>Undertake a pre-works check for wildlife within 24 hours of any vegetation clearance commencing.</p> <p>Delay works if any threatened, rare or other notable species are discovered during the pre-works check.</p> <p>Undertake phased clearance of the vegetation if the pre-works checks cannot confirm absence of wildlife within the vegetation.</p> <p>The phased clearance encourages species to vacate the works area, and includes the soft felling or large trees, which involves the cutting of individual branches and slowly lowering to the ground.</p> | <p>Monthly review of records from the start of construction, on site weekly checks during active works</p> | <p>Prior to the start of any vegetation clearance and then ongoing weekly during active vegetation clearing.</p> | <p>EPC Contractor (EPC Ecologist)</p> | <p>Signatory list with dated photographs detailing that a pre-works check has been undertaken prior to any vegetation clearance</p> <p>Unannounced inspections by the IES and ES</p> |              |
|      |        |                       |                | <p>Hand over any felled trees, dead wood and non-timber forest products (NTFP) to the DFO/CFUGs in compliance with national Legislation.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <p>Monthly inspection of logbook from the start of construction</p>                                        | <p>Immediately after tree felling or collection of NTFPs.</p>                                                    | <p>EPC Contractor (EPC Ecologist)</p> | <p>Review of logbook of felled trees and NTFP and disposal route confirming handover to CFUGs including signed receipts</p>                                                          |              |



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| S.N. | Impact                       | Biodiversity Features | Mitigation aim                               | Mitigation measure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Implementation Frequency                                                        | Trigger for Implementation                                                                                    | Responsibility | Means of Verification                                                                                                                                                    | Linked plans                          |
|------|------------------------------|-----------------------|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| 3    | Forest Resources degradation | Forest ecosystem      | Minimize impacts to forest resources         | <p>Provide worker accommodation per ILO guidelines with heating and all meals to help discourage breaches of prohibition by the workers. Use non-timber sources of energy (e.g., kerosene/LPG, which will be stored in safe conditions) for cooking and heating within all construction and accommodation camps.</p> <p>Strict prohibition on construction workers entering forest area outside of their working hours.</p> <p>Strict prohibition on purchase, sale, and use of firewood, timber and NTFPs, hunting and poaching of fauna by workers.</p> | Monthly review of records from the start of construction, on-site weekly checks | At the start of the project and whenever new workers arrive                                                   | EPC Contractor | <p>Review of worker accommodation provisions Unannounced inspections by the IES and ES</p> <p>Review of records and photographs of awareness programs and attendance</p> | Annex 1.3                             |
| 4    | Reduced forest product       | Forest ecosystem      | Compensatory plantation                      | <p>Select plantation sites in consultation with DFO and Community Forest User Groups (CFUGs). Implement compensatory plantation at an ratio 1:5 as per the Forest Act 2076 (amendment in 2083), of Nepal and manage all the expenses for care taking of the plantation site for 5 years.</p>                                                                                                                                                                                                                                                              |                                                                                 |                                                                                                               |                | ESMU with PSC support                                                                                                                                                    |                                       |
| 5    | Forest fire hazard           | Forest ecosystem      | Controlling the risks associated with forest | <p>Obtain guidance from local experts on the location and specifications for firebreaks.</p> <p>Construct firebreaks in strategic locations to help prevent the spread of fires, as specified and approved by a suitably qualified contractor.</p>                                                                                                                                                                                                                                                                                                        | Before commencement of construction activities near forested areas              | From project start and continuously during construction, especially before any activities near forested areas | EPC Contractor | Review of plan showing location and specification for firebreaks                                                                                                         | Forest Fire Management Strategy, 2010 |



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| S.N. | Impact | Biodiversity Features | Mitigation aim | Mitigation measure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Implementation Frequency        | Trigger for Implementation | Responsibility | Means of Verification                 | Linked plans |
|------|--------|-----------------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|----------------------------|----------------|---------------------------------------|--------------|
|      |        |                       |                | <p>Maintain the firebreaks throughout construction to effectively contain and control potential fire incidents. Educate the workforce on preventing forest fires (e.g. via toolbox talks)</p> <p>Do not use fire as a land clearance method.</p> <p>Refuel outside of the forest area/ natural habitat to minimize the risk of forest fire.</p> <p>Provide fire-fighting equipment.</p> <p>Provide compulsory basic fire training to all workers.</p> <p>Undertake training drills in preparation for forest fire.</p> <p>Act swiftly to minimize impacts on the environment and human life in the event of a fire.</p> <p>Support the Department of Forest (DFO), Department of Forest Research and Survey (DFRS) on early detection, monitoring, and rapid response for forest fires.</p> <p>Install informative signages throughout the DKJTL working area, including an emphasis on preventing fires, to im</p> | Throughout construction period. |                            |                | Forest Fire Management Strategy, 2010 |              |



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| S.N.       | Impact                                       | Biodiversity Features | Mitigation aim                          | Mitigation measure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Implementation Frequency                                                             | Trigger for Implementation                                                   | Responsibility                 | Means of Verification                  | Linked plans         |
|------------|----------------------------------------------|-----------------------|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|------------------------------------------------------------------------------|--------------------------------|----------------------------------------|----------------------|
|            |                                              |                       |                                         | <p>public awareness on forest fires.</p> <p>Collaborate with the DFO to organize training workshops to enhance awareness among the workforce and local Communities.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                      |                                                                              |                                |                                        |                      |
| <b>III</b> | <b>Critical Wildlife Habitat Disturbance</b> |                       |                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                      |                                                                              |                                |                                        |                      |
| <b>1</b>   | Loss of wildlife & wildlife habitat          | Critical Wildlife     | Avoid impacts to Frogs and Dragon flies | <p>Prepare a Frog and Dragon flies Monitoring Plan (FDMP) prior to works commencing.</p> <p>The FDMP must be based on the BMP and comprise at a minimum:</p> <ul style="list-style-type: none"> <li>o Plan objectives</li> <li>o Roles and responsibilities</li> <li>o Precise location of mitigation/monitoring</li> </ul> <p>Approved methodology to be used</p> <ul style="list-style-type: none"> <li>o Risks associated with the works</li> <li>o Timing and schedule of the works</li> <li>o Approved reporting process</li> <li>o Any adaptive management that may be required</li> </ul> <p>The FDMP must be completed with the insight and support of a specialist (herpetologist). The FDMP must be approved by EPC team for the implementation.</p> | Once before construction and conduct monitoring as scheduled throughout the project. | Before construction begins, upon receiving approval from the national expert | EPC Contractor (EPC Ecologist) | Review of Tortoise Management Plan     | Annex 1.2, Annex 1.4 |
|            |                                              |                       |                                         | Adhere to all avoidance, minimization, monthly survey and monitoring requirements as specified in the FDMP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Monthly review of records from the start of construction.                            | Starting at construction commencement and                                    | EPC Contractor (EPC Ecologist) | Review of report of monitoring surveys |                      |



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| S.N.      | Impact              | Biodiversity Features | Mitigation aim                      | Mitigation measure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Implementation Frequency                                             | Trigger for Implementation                                                | Responsibility                                                              | Means of Verification                                                                                                                                                                                                          | Linked plans           |
|-----------|---------------------|-----------------------|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|---------------------------------------------------------------------------|-----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
|           |                     |                       |                                     | <p>Undertake monitoring surveys for turtles throughout the construction period.</p> <p>Educate workers on the importance of turtle and tortoise species during toolbox talks at the commencement of works and at monthly updates. Follow advice of herpetologist if construction occurs during the proposed season, to ensure species safety protocols are followed to protect reptile habitat.</p> <p>Conduct at least annual awareness campaigns for local residents throughout the DKJTL area to highlight the ecological importance of biodiversity and the impact of poaching and forest fires on their habitat.</p> |                                                                      | continuing throughout the project duration.                               |                                                                             | <p>Review of training materials, signatures and photographs of attendance at toolbox talks for workers</p> <p>Review of awareness materials, signatures of attendance and photographs at awareness campaigns for residents</p> |                        |
| <b>IV</b> | <b>Birds</b>        |                       |                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                      |                                                                           |                                                                             |                                                                                                                                                                                                                                |                        |
| <b>1</b>  | Habitat degradation | Birds                 | Avoid impacts to vultures and birds | <p>Undertake bird surveys and study including Vantage Point Surveys, prior to any design and construction works commencing.</p> <p>Use the results of the surveys and studies to:</p> <ul style="list-style-type: none"> <li>➤ Identify additional high use/high exposure areas;</li> <li>➤ Focus mitigation in areas where it will be most beneficial and most likely to result in tangible</li> </ul>                                                                                                                                                                                                                   | Conduct a full bird survey annually prior to design and construction | Start surveys one year before any design or construction activities begin | ESMU with PSC and Environmental Specialist Support - National Ornithologist | Bird Survey Report                                                                                                                                                                                                             | Annex 1.2<br>Annex 1.3 |



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| S.N.     | Impact                                  | Biodiversity Features | Mitigation aim                                | Mitigation measure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Implementation Frequency                                                                     | Trigger for Implementation                                      | Responsibility                 | Means of Verification                                                                                                                                | Linked plans |
|----------|-----------------------------------------|-----------------------|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
|          |                                         |                       |                                               | <p>conservation benefits and avoided vulture mortality;</p> <p>➤ Use the results of the surveys and studies to design additional mitigation if required. Study findings may suggest that the preliminary mitigation recommendations described in the IEE are not optimal, and that those funds can be otherwise applied for greater conservation benefit to bird species</p>                                                                                                                                                                                       |                                                                                              |                                                                 |                                |                                                                                                                                                      |              |
| <b>V</b> | <b>Impact on birds nesting</b>          |                       |                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                              |                                                                 |                                |                                                                                                                                                      |              |
| <b>1</b> | Disturbance to breeding / nesting birds | Bird community        | Avoid disturbance to breeding / nesting birds | <p>Schedule vegetation clearance avoiding bird breeding season of focal species.</p> <p>Undertake a pre-clearance checking of trees for bird nests within 24 hours of works commencing</p> <p>Where avoidance of the breeding season is not practical, vegetation clearance to only be undertaken in areas where threatened, rare or other notable species are unlikely to be encountered.</p> <p>Hold tree felling in the breeding season if nests are found. This applies both to low vegetation, which can host nests of ground nesting species, and larger</p> | Conduct pre-clearance nesting bird checks within 24 hours before vegetation clearance starts | Prior to any vegetation clearance activities during the project | EPC Contractor (EPC Ecologist) | Review of report of preclearance nesting bird checks including dates, species found, location, and whether the area is approved for clearance or not | Annex 1.1    |

| S.N.      | Impact                 | Biodiversity Features | Mitigation aim                          | Mitigation measure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Implementation Frequency                                                                            | Trigger for Implementation                                                                    | Responsibility                 | Means of Verification                                                                                                    | Linked plans           |
|-----------|------------------------|-----------------------|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|--------------------------------|--------------------------------------------------------------------------------------------------------------------------|------------------------|
|           |                        |                       |                                         | shrubs and trees where other species may nest.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                     |                                                                                               |                                |                                                                                                                          |                        |
|           |                        |                       |                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                     |                                                                                               |                                |                                                                                                                          |                        |
|           |                        |                       | Implementation of Bird Diverter         | <p>Do not undertake works within 2km of endangered or critically endangered nesting sites during the breeding season between January and March.</p> <p>Fit bird diverters to the DKJTL alignment as per the recommendation of BSR when installing conductors..</p> <p>Deploy bird diverters on the OPGW/earth wire during the installation process (N.B. on every wire 10 to 20m apart as per requirement and as per recommendation of BSR and IEE.</p> <p>Markers shall be high contrast, with reflective and phosphorescent components, and manufactured by either Power Line Sentry due to their established track record of effectiveness and durability.</p> | <p>One off prior to the start of construction</p> <p>Quarterly inspections in O&amp;M</p>           | Before construction starts in breeding season areas; during the conductor installation phase. | EPC Contractor (EPC Ecologist) | Review of design plans showing location of works in relation to bird nesting sites, and specifications of bird diverters |                        |
| <b>VI</b> | <b>Common wildlife</b> |                       |                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                     |                                                                                               |                                |                                                                                                                          |                        |
| <b>1</b>  | Disturbance to fauna   | Common wildlife       | Avoid and minimize disturbance to fauna | All works to ensure no animals are present within the working area and avoid the unnecessary killing or injury. Checks will be for all vertebrate species and will specifically include nesting birds and reptiles. Only manual                                                                                                                                                                                                                                                                                                                                                                                                                                   | Monthly review of records from the start of construction, on site weekly checks during active works | Preconstruction and during construction                                                       | EPC Contractor (EPC Ecologist) | Report of pre-works checks records including dates, species found,                                                       | Annex 1.4<br>Annex 1.5 |



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| S.N. | Impact               | Biodiversity Features | Mitigation aim                      | Mitigation measure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Implementation Frequency                                                                            | Trigger for Implementation                                                                                                                            | Responsibility                 | Means of Verification                                                                                                                     | Linked plans |
|------|----------------------|-----------------------|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|--------------|
|      |                      |                       |                                     | <p>under the supervision of an ecologist will be permitted if burrows or similar are determined to be occupied.</p> <p>Install a temporary fence around compounds and worksites at the end of each working day to prevent entry of mammals during the night.</p> <p>Robustly fence excavated pits or cover to prevent fauna accidentally falling in at the end of each working day. Install escape ramps to allow their escape particularly in forest area</p>                                                                                                                                                         |                                                                                                     |                                                                                                                                                       |                                | location, and whether the area is approved for clearance or not and photographic evidence of fencing / covering / ramps on excavated pits |              |
| 2    | Poaching and hunting | Wildlife habitats     | Avoid loss of fauna due to poaching | <p>Session every month during construction and whenever new staff are inducted into the project, to raise awareness of the threatened species present and the potential risks to them. This will include:</p> <ul style="list-style-type: none"> <li>➤ roles and responsibilities</li> <li>➤ inventory of all critically endangered, endangered, and protected wildlife species using photographs</li> <li>➤ behavior including bans on hunting, foraging, and trapping,</li> <li>➤ national regulatory requirements,</li> <li>➤ activities that should be observed in specific sections or periods/months.</li> </ul> | Monthly review of records from the start of construction, on site weekly checks during active works | <p>At project mobilization and before work starts, to begin awareness and contract enforcement</p> <p>Weekly monitoring during construction works</p> | EPC Contractor (EPC Ecologist) | Review of training materials and signatory list and photographs showing presence of workers at talk                                       | Annex 1.5    |

| S.N.       | Impact                             | Biodiversity Features | Mitigation aim                                  | Mitigation measure                                                                                                                                                                                                                                                                                                                                                                                                                            | Implementation Frequency                                                                            | Trigger for Implementation | Responsibility | Means of Verification                                                                                              | Linked plans |
|------------|------------------------------------|-----------------------|-------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|----------------------------|----------------|--------------------------------------------------------------------------------------------------------------------|--------------|
|            |                                    |                       |                                                 | <p>Obtain signatures for all site workers and contractors to confirm attendance.</p> <p>Enforce a hunting ban for all workers, with anti-poaching clauses included within all contractual agreements. No potential hunting equipment is allowed within the working area including traps and firearms.</p> <p>Undertake weekly checks on construction camps/overnight accommodation and enforce the measure with fines given to offenders.</p> |                                                                                                     |                            |                |                                                                                                                    |              |
| <b>VII</b> | <b>Waste generation</b>            |                       |                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                     |                            |                |                                                                                                                    |              |
| <b>1</b>   | Irresponsible for waste management | Habitat quality       | Responsible waste management                    | Manage waste created during the construction activities under the EMP, to limit the disturbance to fauna because of presence of wastes and spills.                                                                                                                                                                                                                                                                                            | Monthly review of records from the start of construction, on site weekly checks during active works | Construction               | EPC Contractor | Visual inspection of work site and waste storage areas including photographic records                              | Annex 1.3    |
|            |                                    |                       | Responsible waste hazardous material management | <p>Do not store wastes and any other product containing hazardous chemical substances (e.g., fuel) in the proximity of freshwater features.</p> <p>Do not dump excavated materials into freshwater features, or store in their proximity, to avoid any increase of the turbidity levels</p>                                                                                                                                                   | Monthly review of records from the start of construction, on site weekly checks during active works | Construction               | EPC Contractor | Visual inspection of storage areas and of handling of hazardous chemical substances including photographic records |              |



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| S.N. | Impact                                                      | Biodiversity Features | Mitigation aim                          | Mitigation measure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Implementation Frequency                                                                            | Trigger for Implementation       | Responsibility | Means of Verification                                                                 | Linked plans |
|------|-------------------------------------------------------------|-----------------------|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|----------------------------------|----------------|---------------------------------------------------------------------------------------|--------------|
| 2    | Improper disposal risks (cut vegetation and tree trimmings) |                       | Responsible vegetation waste management | <p>Remove cut/trimmed trees and other vegetation trimmings offsite immediately for disposal as soon as vegetation clearance is Completed.</p> <p>Dispose of vegetation waste to a suitably with collaboration of local governance (Ward/RM) facility with all waste transfer records retained, unless handed over to the landowner, DFO, user groups or otherwise sold for reuse.</p> <p>Temporarily store cut/trimmed trees and other vegetation Trimmings away from the roadside. No blocking of accesses or roads with cut vegetation. No dumping of cut vegetation on agricultural fields.</p> | Monthly review of records from the start of construction, on site weekly checks during active works | Preconstruction and construction | EPC Contractor | Review of waste transfer records for disposal by licensed waste management contractor |              |

#### Operation Phase

|   |                 |                     |  |                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                    |                                                                                    |     |                                            |           |
|---|-----------------|---------------------|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|------------------------------------------------------------------------------------|-----|--------------------------------------------|-----------|
| 1 | Vegetation loss | Forest Biodiversity |  | <p>Regular but Controlled Vegetation Management (CVM) in right-of-way (ROW) clearance only up to safety standards. Selective &amp; Manual Clearing. Allow natural regeneration wherever possible. Prevent Encroachment &amp; Fire Risk. Stabilize soil with grass planting or bioengineering in ROW to avoid erosion. Maintain habitat corridors across the line (avoid blocking wildlife movement). Periodic Monitoring &amp; Reporting</p> | Conduct annual ecological monitoring of vegetation | When trees/shrubs grow close to conductors (violating minimum clearance standards) | NEA | Examine the published annual report of NEA | Annex 1.5 |
|---|-----------------|---------------------|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|------------------------------------------------------------------------------------|-----|--------------------------------------------|-----------|



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| S.N. | Impact                      | Biodiversity Features       | Mitigation aim | Mitigation measure                                                                                                                                                                                                                                                                                                                                                                                                       | Implementation Frequency            | Trigger for Implementation                                                  | Responsibility | Means of Verification                                                        | Linked plans                          |
|------|-----------------------------|-----------------------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-----------------------------------------------------------------------------|----------------|------------------------------------------------------------------------------|---------------------------------------|
| 2    | Disturbance in breeding     | Bird Biodiversity (general) |                | Schedule vegetation clearance outside the nesting bird season, with particular attention to avoiding the Bird breeding season.                                                                                                                                                                                                                                                                                           | Annually (Prior to clearance works) | When vegetation clearance is required in or near potential breeding habitat | NEA            | If bird nesting occurs, the safe bird evacuation procedure will be followed. | Annex 1.6                             |
| 3    | Impacts of wildlife         | Wildlife diversity          |                | Avoid using lightening unless it is essential for safety.                                                                                                                                                                                                                                                                                                                                                                | As needed                           | When there is a safety requirement (e.g., nighttime work).                  | NEA            | Review of site inspections                                                   | Annex 1.3                             |
| 4    | Impacts to forest resources | Ecosystem services          |                | Enforce a strict prohibition on workers entering the outside of RoW in forest area during O & M.                                                                                                                                                                                                                                                                                                                         | As needed                           | When regrowth of trees in ROW threatens line safety                         | NEA            | Inspection reports Documenting compliance                                    | Annex 1.1                             |
| 5    | Forest Fire                 | Forest Biodiversity         |                | Clear (bushes) RoW before dry seasons in order to maintained the forest break line to prevent forest fire.                                                                                                                                                                                                                                                                                                               | Once per year                       | Before Dry Season                                                           | NEA            | Inspection report                                                            | Forest Fire Management Strategy, 2010 |
|      |                             |                             | Safety measure | Maintain a minimum vertical clearance of 7 m between the conductor and tree canopy ground throughout works. This gap ensures safe passage for fauna by minimizing the risk of wildlife collisions or obstructions caused by the DKJTL infrastructure. For example, this height requirement ensures that larger animals such as deer can pass underneath the conductor without risk of collision or entanglement. It also | yearly inspections in O&M           | maintenance inspections                                                     | GRID/NEA       | Report of inspections to confirm clearances maintained due to sag            |                                       |



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| S.N. | Impact | Biodiversity Features | Mitigation aim     | Mitigation measure                                                                                                     | Implementation Frequency                                 | Trigger for Implementation   | Responsibility                 | Means of Verification                                           | Linked plans |
|------|--------|-----------------------|--------------------|------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|------------------------------|--------------------------------|-----------------------------------------------------------------|--------------|
|      |        |                       |                    | the safe movement of arboreal species like monkeys or birds that may use the elevated space for navigation or nesting. |                                                          |                              |                                |                                                                 |              |
|      |        |                       | Record of incident | Record and photograph any animal casualties, including a cause of death if known.                                      | Monthly review of records from the start of construction | During and post construction | EPC Contractor (EPC Ecologist) | Review of incident log within 24 hours of casualties by ES unit |              |

## **BIODIVERSITY MONITORING, EVALUATION AND ADAPTIVE MANAGEMENT**

### **B. Monitoring and Mitigation Measure**

Monitoring the implementation of project mitigation measures involves a structured framework that details how biodiversity impacts will be avoided, reduced, or restored, along with clear guidance for execution and evaluation. The monitoring and mitigation measures framework includes following elements:

- Mitigation Aim outlines whether the goal is to avoid, minimize, or restore biodiversity impacts, ensuring alignment with conservation principles.
- Required Actions define the specific steps needed to meet each mitigation objective.
- Project Phase indicates when during the DKJTLP project lifecycle each action will be undertaken.
- Responsible Party assigns the entity or individual accountable for carrying out the mitigation activity.
- Accountability identifies who will be held responsible if actions are not implemented properly.
- Verification Method describes how success will be measured and actions validated.
- Key Performance Indicators (KPIs) provide quantifiable benchmarks to assess progress.
- Timing and Frequency specifies the schedule for implementation and monitoring of each action.
- Monitoring Responsibility designates the agency or personnel tasked with overseeing monitoring processes.

#### **Implementation and Oversight:**

Mitigation measures are to be implemented and monitored throughout both the construction and operational phases, covering the entire project site, especially ecologically sensitive areas such as natural habitats, transmission line routes, and access roads. Verification tools include Codes of Conduct, training documentation, satellite imagery analysis, and site rehabilitation plans referenced in annexes. The Project Management Unit (PMU)/Project Supervision Consultant (PSC) and District Forest Office (DFO) are responsible for supervising the application and effectiveness of mitigation actions, ensuring consistency with the Biodiversity Management Plan and its supporting annexes.

## Annexure 7: Biodiversity Monitoring the Implementation of Project Mitigation Measure

| Ref. I.D. | Mitigation Measure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Indicators                                                                                                                                                                                                    | Means of Verification                                                                                                                                                                 | Monitoring Frequency                                                            | Responsibility                                 | Thresholds                                                                                  |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|------------------------------------------------|---------------------------------------------------------------------------------------------|
| I 1       | <p>Map and confirm in writing the exact site limits for all construction sites including the access routes, storage areas and all other temporary facilities.</p> <p>Catalogue and report the number of each species of tree that will be cleared to make way for the TL and mark all trees to be cleared e.g. tree tags.</p> <p>Obtain a permit for felling from the relevant government department if felling cannot be avoided.</p> <p>Complete all pre-construction measures (above actions) alongside representatives from the forest authority, community forest, leasehold forestry, and other relevant stakeholders.</p> | <p>Satisfactory surveys, designs and plans prepared pre-construction, and approved by PSC</p> <p>Written approval of tree enumeration by DFO</p> <p>Relevant permits having been secured prior to felling</p> | <p>Review of published report (EME) detailing results of tree enumeration for the right of way and all temporary facilities</p> <p>Review of relevant permits secured for felling</p> | <p>One-off upon completion of survey, marking, and documentation</p>            | <p>ESMU with support PSC/Forest Department</p> | No issues; approval and permits verified.                                                   |
|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                               |                                                                                                                                                                                       |                                                                                 |                                                | Delays or minor gaps in documentation requiring further investigation or corrective action. |
|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                               |                                                                                                                                                                                       |                                                                                 |                                                | Works commence without approval/permits or unreported felling detected                      |
| II 2      | <p>Map and confirm in writing the exact site limits for all terrestrial sites including the access routes, storage areas and all other temporary facilities.</p> <p>Survey habitats beneath towers and within the site limits including natural habitat is present</p> <ul style="list-style-type: none"> <li>• quality of all forest cover within the site limits</li> <li>• the location, number, species of tree requiring felling/trimming/pollarding</li> </ul> <p>Apply adaptive management measures to reduce impacts to habitats and species.</p> <p>Works commence only after IES and ES approval.</p>                  | <p>Satisfactory surveys, designs and approved in writing by PSC IES and ESMU</p>                                                                                                                              | <p>Review Ecological Monitoring Report (EMR), covering RoW and temporary facilities</p>                                                                                               | <p>One-off survey completion; monthly compliance checks during construction</p> | <p>ESMU with support PSC</p>                   | Surveys approved and adaptive measures implemented.                                         |
|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                               |                                                                                                                                                                                       |                                                                                 |                                                | Delays or incomplete surveys requiring corrective action.                                   |
|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                               |                                                                                                                                                                                       |                                                                                 |                                                | Works commenced without approvals                                                           |
|           | Collaborate with Divisional Forest Office, Community Forest User Groups ensuring their                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Records of                                                                                                                                                                                                    | Meeting records, minutes, photos with DFO/CFUG                                                                                                                                        | One off prior to construction                                                   | ESMU with support PSC                          | Stakeholder consultations completed,                                                        |

| Ref. I.D. | Mitigation Measure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Indicators                                                       | Means of Verification                                                                                                        | Monitoring Frequency                                                 | Responsibility              | Thresholds                                                           |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|-----------------------------|----------------------------------------------------------------------|
|           | involvement and expertise in the tree felling process.<br>Include feedback within the above plans                                                                                                                                                                                                                                                                                                                                                                                                                                                         | stakeholders collaboration integrated into plans                 |                                                                                                                              |                                                                      |                             | records maintained.                                                  |
|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                  |                                                                                                                              |                                                                      |                             | No stakeholder consultation                                          |
|           | Undertake a pre-works check for wildlife within 24 hours of any vegetation clearance commencing.<br><br>Delay works if any threatened, rare or other notable species are discovered during the pre-works check.<br>Undertake phased clearance of the vegetation if the pre-works checks cannot confirm absence of wildlife within the vegetation.<br>The phased clearance encourages species to vacate the works area, and includes the soft felling or large trees, which involves the cutting of individual branches and slowly lowering to the ground. | No loss/ harm to threatened, other notable species               | Signatory list with dated photographs detailing that a pre-works check has been undertaken prior to any vegetation clearance | Monthly review of records, weekly checks during active works         | ESMU with support PSC       | Wildlife checks completed, phased clearance followed.                |
|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                  |                                                                                                                              |                                                                      |                             | Missed or incomplete wildlife checks.                                |
|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                  |                                                                                                                              |                                                                      |                             | Wildlife harmed or clearance without checks                          |
|           | Hand over any felled trees, dead wood and non-timber forest products (NTFP) to the CFUGs in compliance with national legislation.                                                                                                                                                                                                                                                                                                                                                                                                                         | Felled trees and NTFP handed over to CFUGs                       | Logbook of felled trees and NTFP and handover to CFUGs including signed receipts                                             | Monthly inspection of logbook during construction                    | ESMU with support PSC       | Handover records complete and verified.                              |
|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                  |                                                                                                                              |                                                                      |                             | Delays or incomplete logbook entries.                                |
|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                  |                                                                                                                              |                                                                      |                             | Illegal disposal or failure to hand over NTFPs                       |
| II 3      | Provide worker accommodation per ILO guidelines with heating and all meals to help discourage breaches of prohibition by the workers. Use non-timber sources of energy (e.g., LPG, which will be stored in safe conditions) for                                                                                                                                                                                                                                                                                                                           | Accommodation provisions reviewed and approved in writing by PSC | Review of worker accommodation provisions<br><br>Unannounced                                                                 | Monthly review of records, weekly on-site checks during construction | Contractors' responsibility | Accommodation up to standard, LPG used, >90% attendance at talks, no |



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| Ref. I.D. | Mitigation Measure                                                                                                                                                                                                                                                                                                                                                                                                                                      | Indicators                                                                                                                   | Means of Verification                                                                              | Monitoring Frequency                                                | Responsibility                                    | Thresholds                                                                                                                                                                                                                                           |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           | <p>cooking and heating within all construction and accommodation camps.</p> <p>Strict prohibition on construction workers entering forest area/natural habitat outside of their working hours.</p> <p>Strict prohibition on purchase, sale, and use of firewood, timber and NTFPs, hunting and poaching of fauna by workers.</p>                                                                                                                        | <p>Good standard of worker accommodation</p> <p>More than 90% worker attendance at awareness talk</p>                        | <p>by the IES and ES</p> <p>Records and photographs of awareness programs and attendance</p>       |                                                                     |                                                   | <p>breaches recorded.</p> <p>Minor lapses (e.g., &lt;90% attendance, occasional small violations, minor LPG storage issues)</p> <p>Serious breaches (illegal firewood/NTFP use, hunting/poaching, unsafe fuel practices, or repeated violations)</p> |
| II 4      | <p>Select plantation sites for compensatory planting in consultation with the respective DFO and user groups prior to works commencing.</p> <p>Coordinate with the DFO and involve the affected Community Forest User Groups in implementation of compensatory plantation activities.</p> <p>Create plantation sites for compensatory planting at a ratio of 1:5. Plantation and the care taking of the plantation sites as per the requirements of</p> | <p>Landscape Management Plan approved prior to construction.</p> <p>Compensatory plantation completed prior to handover.</p> | <p>Review of Landscape Management Plan.</p> <p>Survey report of compensatory plantation areas.</p> | Monthly during initial phase; periodic reviews until end of 5 years | ESMU with PSC support (with DFO/CFUG involvement) | Plantation plan approved, compensatory planting completed at required ratios, DFO approval obtained.                                                                                                                                                 |

| Ref. I.D. | Mitigation Measure                                                                                                                                                                                                                                                                                             | Indicators                                                                                                  | Means of Verification                                                                                    | Monitoring Frequency                                                | Responsibility                                    | Thresholds                                                            |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------|-----------------------------------------------------------------------|
|           | <p>forest act 2076. Sapling species will be selected in consultation with the communities and DFOs.</p> <p>Aim at plantation of a standard of 1600 seedlings per ha.<br/>Bear all the expenses related to the cutting, stockpiling, and transportation of the trees.</p>                                       | Written approval from DFO                                                                                   | Photographs of plantation measures.                                                                      |                                                                     |                                                   | Minor gaps in ratios, delays in planting, or incomplete documentation |
|           |                                                                                                                                                                                                                                                                                                                |                                                                                                             |                                                                                                          |                                                                     |                                                   | Failure to implement compensatory plantation or secure DFO approval   |
|           | <p>Monitor the current health and survival status of newly planted trees, for a minimum of five years following plantation.</p> <p>NEA may opt to delegate the management of the plantation areas to the local DFO or user groups, with continued support from the DKJTL for designated period of 5 years.</p> | <p>≥80% survival in initial establishment.</p> <p>≥60% survival at 5-year completion. management period</p> | <p>Review of plantation survival status reports.</p> <p>Visual inspections of sites by PSC/IES/ESMU.</p> | Monthly during initial phase; periodic reviews until end of 5 years | ESMU with PSC support (with DFO/CFUG involvement) | ≥80% establishment initially, ≥60% survival at 5 years.               |
|           |                                                                                                                                                                                                                                                                                                                |                                                                                                             |                                                                                                          |                                                                     |                                                   | Survival rates (e.g., 60–79% initially, 50–59% at 5 years)            |
|           |                                                                                                                                                                                                                                                                                                                |                                                                                                             |                                                                                                          |                                                                     |                                                   | Severe plantation failure (<60% initial survival or <50% at 5 years)  |

| Ref. I.D. | Mitigation Measure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Indicators                                                                                                                                                                                                                                              | Means of Verification                                                                                                                                                                                                                | Monitoring Frequency                                                                                                                  | Responsibility        | Thresholds                                                                                                                                                                                                                                                                                   |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| II 5      | <p>Obtain guidance from local experts on the location and specifications for firebreaks.</p> <p>Construct firebreaks in strategic locations to help prevent the spread of fires, as specified and approved by a suitably qualified contractor.</p> <p>Maintain the firebreaks throughout construction to effectively contain and control potential fire incidents.</p> <p>Educate the workforce on preventing forest fires (e.g. via toolbox talks)</p> <p>Do not use fire as a land clearance method.</p> <p>Refuel outside of the forest area /natural habitat to minimize the risk of forest fire.</p> <p>Provide fire-fighting equipment.</p> <p>Provide compulsory basic fire training to all workers.</p> <p>Undertake training drills in preparation for forest fire.</p> <p>Act swiftly to minimize impacts on the environment and human life in the event of a fire.</p> | <p>Firebreak plan approved by PSC/ESMU (Comply Fire Management Strategy, 2010)</p> <p>Firefighting equipment available and functional.</p> <p>Records of workforce training and drills.</p> <p>No fire incidents caused by construction activities.</p> | <p>Review of approved firebreak plan and specifications.</p> <p>Review of inspection logbooks.</p> <p>Records of training, toolbox talks, drills, and awareness workshops.</p> <p>On-site verification of signage and equipment.</p> | One-off review of firebreak plan prior to construction; then monthly review of records and weekly on-site checks during construction. | ESMU with PSC support | <p>Firebreak plan approved, firebreaks constructed and maintained, equipment available, ≥90% workers trained, no construction-related fire incidents.</p> <p>Minor issues (e.g., &lt;90% workers trained, delayed maintenance of some firebreaks, gaps in signage) but no fire incidents</p> |

| Ref. I.D. | Mitigation Measure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Indicators                                                                        | Means of Verification                                                                        | Monitoring Frequency                       | Responsibility        | Thresholds                                                                                                                                                                                                                       |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|--------------------------------------------|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           | <p>Support the Department of Forest and Soil Conservation (DoFSC), Department of Forest Research and Survey (DFRS) on early detection, monitoring, and rapid response for forest fires.</p> <p>Install informative signages throughout the DKJTL working area, including an emphasis on preventing fires, to improve public awareness on forest fires.</p> <p>Collaborate with the DFOs to organize training workshops to enhance awareness among the workforce and local communities.</p>                                                                                                                                                                                                                                                                                                                |                                                                                   |                                                                                              |                                            |                       | Fire incidents caused by project, major gaps in firebreak maintenance, lack of firefighting equipment, or no worker training                                                                                                     |
| III 1     | <p>Prepare a Frog &amp; Dragon Flies Monitoring Plan (FDMP) prior to works commencing.</p> <p>The FDMP must be based on the BMP and comprise at a minimum:</p> <ul style="list-style-type: none"> <li>o Plan objectives</li> <li>o Roles and responsibilities</li> <li>o Precise location of mitigation/monitoring</li> </ul> <p>Approved methodology to be used</p> <ul style="list-style-type: none"> <li>o Risks associated with the works</li> <li>o Timing and schedule of the works</li> <li>o Approved reporting process</li> <li>o Any adaptive management that may be required</li> </ul> <p>The FDMP must be approved by the independent national herpetologist (environment specialist support) before issue to the PMU for approval and the EPC construction team for the implementation.</p> | FDMP completed and approved in writing by independent herpetologist, IES, and ES. | <p>Review of FDMP document.</p> <p>Confirmation of approval by herpetologist and IES/ES.</p> | One off prior to the start of construction | ESMU with PSC support | <p>FDMP approved by herpetologist and IES/ES; ready for implementation.</p> <p>Minor revisions requested by herpetologist or IES/ES before approval; work delayed until FDMP finalized.</p> <p>FDMP not prepared or approved</p> |

| Ref. I.D.   | Mitigation Measure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Indicators                                                                                                                                                                                                            | Means of Verification                                                                                                                                                                      | Monitoring Frequency                                                                                | Responsibility                                                                                    | Thresholds                                                                                                                                                                                                                                                                                                                                                             |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|             | <p>Adhere to all avoidance, minimization, monthly survey and monitoring requirements as specified in the FDMP</p> <p>Undertake monitoring surveys for turtles throughout the construction period.</p> <p>Educate workers on the importance of Frog species during toolbox talks at the commencement of works, and at monthly updates.</p> <p>Follow advice of herpetologist if construction occurs during the proposed season, to ensure species safety protocols are followed to protect reptile habitat.</p> <p>Conduct at least annual awareness campaigns for local residents throughout the DKJTL area to highlight the ecological importance of Frogs and the impact of poaching and forest fires on their habitat.</p> | <p>No loss or harm to frog, Dragon flies and other reptile species</p> <p>Monthly monitoring surveys conducted.</p> <p>Toolbox talks delivered to workers.</p> <p>Annual community awareness campaigns conducted.</p> | <p>Review of monitoring survey reports.</p> <p>Review of toolbox talk materials, attendance sheets, and photos.</p> <p>Review of awareness campaign materials, attendance, and photos.</p> | <p>Monthly review of records; weekly on-site inspections; annual review of community campaigns.</p> | <p>ESMU with PSC support</p>                                                                      | <p>Monitoring surveys conducted on schedule, ≥90% workers trained, annual community campaigns completed, no mortality or habitat disturbance.</p> <p>Minor lapses (e.g., some surveys delayed, &lt;90% workers trained, campaign postponed) but no species mortality</p> <p>Mortality or habitat destruction recorded, surveys/training /campaigns not implemented</p> |
| <b>IV 1</b> | <p>Undertake a bird surveys and studies including Transponder Study and Vantage Point Surveys the year prior to any design and construction works commencing.</p> <p>Use the results of the surveys and studies to:</p> <ul style="list-style-type: none"> <li>➤ Identify additional high use/high exposure areas;</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                 | <p>Surveys and studies completed prior to design/ construction.</p> <p>BMP and IEE updated to reflect survey findings.</p>                                                                                            | <p>Review of survey reports.</p> <p>Review of updated BMP and IEE, including mitigation refinements.</p> <p>Confirmation of</p>                                                            | <p>One off prior to the start of design and construction</p>                                        | <p>Environmental Specialist Support – National Ecologist, if possible International Ecologist</p> | <p>Surveys completed and BMP/IEE updated; no issues detected; mitigation measures incorporated.</p>                                                                                                                                                                                                                                                                    |

| Ref. I.D. | Mitigation Measure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Indicators                                                          | Means of Verification                                                                                                                                                                    | Monitoring Frequency                                                                                           | Responsibility        | Thresholds                                                                                                                                                                                                                                                                               |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           | <ul style="list-style-type: none"> <li>➤ Focus mitigation in areas where it will be most beneficial and most likely to result in tangible conservation benefits and avoided birds mortality;</li> <li>➤ Use the results of the surveys and studies to design additional mitigation if required. Study findings may suggest that the preliminary mitigation recommendations described in the EIA are not optimal, and that those funds can be otherwise applied for greater conservation benefit to vulture species.</li> </ul> <p>Update the BMP and IEE based on the above prior to design and construction works commencing, as relevant, and disclose update</p>                                                                 | Updated BMP/IEE disclosed and incorporated in contract documents.   | inclusion in contract documentation                                                                                                                                                      |                                                                                                                |                       | <p>Surveys completed but findings suggest additional high-risk areas or refinements needed; update BMP/IEE and apply stricter mitigation.</p> <p>Surveys not completed, or BMP/IEE not updated; high-risk areas not addressed.</p>                                                       |
| V 1       | <p>Schedule vegetation clearance outside the nesting bird season, with particular attention to avoiding the birds breeding season between January and March.</p> <p>Undertake a pre-clearance nesting bird check of the vegetation to be cleared within 24 hours of works commencing</p> <p>Where avoidance of the breeding season is not practical, vegetation clearance to only be undertaken in areas where threatened, rare or other notable species are unlikely to be encountered.</p> <p>Defer clearance until after the breeding season is over if nests are discovered. This applies both to low vegetation, which can host nests of ground nesting species, and larger shrubs and trees where other species may nest.</p> | <p>No loss or harm to birds</p> <p>No disturbance of bird nests</p> | <p>Review of pre-clearance nesting bird check reports, including dates, species found, locations, and clearance approvals.</p> <p>Verification that deferred areas remain protected.</p> | Monthly review of records from start of construction; on-site weekly checks during active vegetation clearance | ESMU with PSC support | <p>Pre-clearance checks conducted; no nests disturbed; clearance approved in safe areas.</p> <p>Minor oversights in pre-clearance checks; some risk of disturbance; corrective action needed immediately.</p> <p>Nesting birds disturbed or harmed; clearance conducted in breach of</p> |



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| Ref. I.D. | Mitigation Measure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Indicators                                                                            | Means of Verification                                                                                                                                                  | Monitoring Frequency                                                                            | Responsibility        | Thresholds                                                                                    |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-----------------------|-----------------------------------------------------------------------------------------------|
|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                       |                                                                                                                                                                        |                                                                                                 |                       | breeding season                                                                               |
| VI 1      | <p>All works to ensure no animals are present within the working area and avoid the unnecessary killing or injury. Checks will be for all vertebrate species and will specifically include nesting birds and reptiles. Only manual digging under the supervision of an ecologist will be permitted if burrows or similar are determined to be occupied.</p> <p>Undertake checks of any open works (e.g., pits, trenches) daily and move animals found moved to safety.</p> <p>Install a temporary fence around compounds and worksites at the end of each working day to prevent entry of mammals during the night.</p> <p>Robustly fence excavated pits or cover to prevent fauna accidentally falling in at the end of each working day. Install escape ramps to allow their escape particularly in forest area</p> | No loss or harm to wildlife                                                           | <p>Pre-works check records including dates, species found, locations, and clearance approvals.</p> <p>Photographic evidence of fencing, covering, and escape ramps</p> | Monthly review of records from start of construction; on-site weekly checks during active works | ESMU with PSC support | Checks conducted; no wildlife harmed; fences, covers, and ramps correctly installed.          |
|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                       |                                                                                                                                                                        |                                                                                                 |                       | Minor lapses in checks or temporary fencing/covering; corrective action required immediately. |
|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                       |                                                                                                                                                                        |                                                                                                 |                       | Wildlife harmed, trapped, or killed; fences/covers absent or ineffective                      |
| VI 2      | <p>Session every month during construction and whenever new staff are inducted into the project, to raise awareness of the threatened species present and the potential risks to them. This will include:</p> <ul style="list-style-type: none"> <li>➤ roles and responsibilities</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <p>≥90% worker attendance at toolbox talks.</p> <p>No evidence of hunting, traps,</p> | <p>Review of training materials and signatory lists.</p> <p>Photographic evidence of worker attendance.</p>                                                            | Monthly review of records from start of construction; weekly on-site                            | ESMU with PSC support | ≥90% attendance; no evidence of poaching; all inspections compliant.                          |

| Ref. I.D. | Mitigation Measure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Indicators                                                      | Means of Verification                                                                                                            | Monitoring Frequency                                                                 | Responsibility           | Thresholds                                                                                                                                                                                                        |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           | <ul style="list-style-type: none"> <li>➤ inventory of all critically endangered, endangered, and protected wildlife species using photographs</li> <li>➤ behavior including bans on hunting, foraging, and trapping,</li> <li>➤ national regulatory requirements,</li> <li>➤ activities that should be observed in specific sections</li> </ul> <p>Obtain signatures for all site workers and contractors to confirm attendance.</p> <p>Enforce a hunting ban for all workers, with anti-poaching clauses included within all contractual agreements. No potential hunting equipment is allowed within the working area including traps and firearms.</p> | firearms, or dogs on site                                       | Records of inspections, fines, and enforcement actions.                                                                          | checks during active works                                                           |                          | <p>Attendance &lt;90% or minor lapses in enforcement; corrective measures applied immediately.</p> <p>Hunting or poaching incidents occur; traps, firearms, or dogs found on site</p>                             |
| VII 1     | Manage waste created during the construction activities under the EMP, to limit the disturbance to fauna because of presence of wastes and spills.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Zero waste-related incidents impacting fauna or the environment | <p>Visual inspection of work sites and waste storage areas.</p> <p>Review of monthly reports including photographic records.</p> | Monthly review from start of construction; weekly on-site checks during active works | ES ESMU with PSC support | <p>Waste properly managed; no incidents observed.</p> <p>Minor issues in waste management; corrective measures applied immediately.</p> <p>Significant waste-related incidents affecting fauna or environment</p> |
|           | Do not store wastes and any other product containing hazardous chemical substances (e.g., fuel) in the proximity of freshwater features.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | No spills of hazardous chemical substances into water bodies    | Visual inspection of storage areas and of handling of hazardous                                                                  | Monthly review from start of construction; weekly on-site                            | ESMU with PSC support    | No spills; storage and handling compliant.                                                                                                                                                                        |

| Ref. I.D. | Mitigation Measure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Indicators                                                                                                                                                 | Means of Verification                                                                                      | Monitoring Frequency                                                                 | Responsibility        | Thresholds                                                                                                                                                   |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           | Do not dump excavated materials into freshwater features, or store in their proximity, to avoid any increase of the turbidity levels.                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                            | chemical substances<br><br>Review of monthly reports including photographic records.                       | checks during active works                                                           |                       | Minor lapses in storage or handling; corrective measures applied immediately.                                                                                |
|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                            |                                                                                                            |                                                                                      |                       | Spill or contamination affecting freshwater                                                                                                                  |
|           | Remove cut/trimmed trees and other vegetation trimmings offsite immediately for disposal as soon as vegetation clearance is completed.<br><br>Dispose of vegetation waste to a suitably licensed waste management facility with all waste transfer records retained, unless handed over to the landowner, DFO, user groups or otherwise sold for reuse.<br>Temporarily store cut/trimmed trees and other vegetation trimmings away from the roadside. No blocking of accesses or roads with cut vegetation. | All vegetation waste disposed to licensed facility or handed over/reused appropriately.<br><br>No obstruction of roads/access                              | Review of waste transfer records for licensed disposal.<br><br>Verification of temporary storage practices | Monthly review from start of construction; weekly on-site checks during active works | ESMU with PSC support | All waste disposed or handed over appropriately; no road/access blockage.                                                                                    |
|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                            |                                                                                                            |                                                                                      |                       | Vegetation waste improperly stored or disposed; roads/access blocked                                                                                         |
| O.1       | Regular but controlled vegetation management (CVM) in ROW: selective/manual clearing only; encourage native low-height species; allow natural regeneration; prevent encroachment & fire risk; stabilize soil; maintain wildlife corridors; periodic monitoring & reporting                                                                                                                                                                                                                                  | 1. Regular Bushes cutting within ROW<br>2. Presence of native low-height species<br>3. Evidence of natural regeneration<br>4. Habitat corridors maintained | 1. Published Annual Report of NEA<br>2. Field inspection reports and photographs                           | 1. Annual ecological monitoring of vegetation<br>2. Periodic field inspections       | NEA                   | All clearing limited to approved areas, corridors intact<br>Minor non-compliance or delays in natural regeneration/soil stabilization<br>Unapproved clearing |
| O.2       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1. Work schedule and site plan indicating                                                                                                                  | 1. Verification of clearance timing                                                                        | Annually during                                                                      | NEA                   | Clearance avoided during                                                                                                                                     |



|            |                                                                                                                                |                                                                                                                                                                    |                                                                                         |                                                                     |     |                                                                                                                                                                                  |
|------------|--------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|---------------------------------------------------------------------|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|            | Schedule vegetation clearance outside the nesting bird season, with particular attention to avoiding the Bird breeding season. | clearance timing<br>2. Ecologist assessment confirming absence of threatened/rare /Notable species<br>3. Marked-up site plans showing cleared vs. restricted areas | 2. Pre-clearance work order issued<br>3. Photographs of site before and after clearance | breeding season; daily pre-clearance checks during active clearance |     | breeding season or pre-clearance confirms no nests<br>Minor deviations from timing or limited areas cleared<br>Clearance conducted in active nesting areas without authorization |
| <b>O.3</b> | Avoid using lighting unless essential for safety. Where necessary, lighting must be directional and use non-UV sources.        | Lighting used on-site; confirmation that only directional, non-UV lighting is installed                                                                            | Review of lighting used at site, site inspection reports, and photographs               | Once before installation; review whenever new lighting is added     | NEA | Only approved lighting installed<br>Few & unstandardized lighting installed<br>No lighting installed                                                                             |
| <b>O.4</b> | Enforce a strict prohibition on workers entering the outside of RoW in forest area during O & M.                               | Records of unannounced site inspections confirming no unauthorized entry                                                                                           | Inspection reports; photographic evidence                                               | During the time of each ROW bushes cutting time                     | NEA | No unauthorized entry detected<br>Entry detected<br>Instance of unauthorized entry regularly                                                                                     |
| <b>O.5</b> | Clear (bushes) RoW before dry seasons in order to maintained the forest break line to prevent forest fire.                     | Attendance sheets, signed records of work done and photos                                                                                                          | Site inspection; reports; photographic evidence                                         | At least once at site setup, with refresher sessions annually       | NEA | Signed records of work done and photos<br>Absence of signed records or photographs<br>Failure to conduct works                                                                   |

**Note:** Some thresholds are not categorized in Ambur, as it would not be practical to apply mitigation measures for them.

### **C. Monitoring and Adaptive Management**

The contractor is required to develop a Construction-Specific Environmental Management Plan (CSEMP), which must include relevant ecological species plans and align with both the Biodiversity Management Plan (BMP) and the Environmental Management Plan (EMP) for the DKJTL project. This plan must be reviewed and approved by the PMU, with input from the Project Supervision Consultant (PSC), before any construction begins. The EPC Contractor will be responsible for implementing, supervising, and monitoring the proposed mitigation measures. These efforts will be evaluated to ensure compliance and effectiveness, with further adaptive actions taken as needed. Qualified professionals must carry out all supervision and monitoring tasks.

The recommended avoidance and mitigation actions follow internationally recognized best practices and are considered manageable. The EPC Contractor must report regularly to the Project Management Unit (PMU), while the ESMU will oversee the IEE compliances and the E&S performance of the EPC contractor. Routine checks such as signage placement or toolbox talks will be part of this verification process.

#### **Wildlife Monitoring**

The ESMU, with assistance from the PMU's team, will set up a wildlife monitoring system before construction starts and continue it throughout the construction phase. This system will track sightings of key species identified in the Critical Habitat Assessment (CHA). All personnel, including contractors and locals, will be encouraged to report sightings or evidence (live sightings, remains, or signs within 100 m of the project) to the project ecologists/environmentalist. These observations, supported by photographs and shared during toolbox talks, will help assess the need for additional conservation actions.

The monitoring program, led by the ESMU and supported by the EPC ecologist, will guide decision-making to avoid biodiversity loss. If impacts on species occur-such as electrocution or failed restoration efforts-new measures will be designed in collaboration with specialists. The collected data will help evaluate whether conservation goals are being met, and further guidance is provided in the Biodiversity Action Plan (BAP).

#### **Habitat Restoration**

To offset vegetation loss, tree planting will occur at a ratio of 1:5 as per forest act 2076. The Nepal Electricity Authority (NEA)' with the support DFO to monitor these compensatory plantings over five years, ensuring legal compliance and adherence to ADB requirements. Monthly inspections will verify tree survival and health.

If issues arise-such as high planting failure, natural disasters, or limited availability of suitable species-adaptive actions will be triggered. After five years, the responsibility for ongoing maintenance and monitoring may transfer to the District Forest Office (DFO) or local User Groups, with the possibility of early handover supported by NEA.

#### **BMP Implementation**

To successfully implement the BMP, the EPC Contractor must fully understand and take charge of all biodiversity-related responsibilities during the pre-construction and construction phases. The contractor's qualifications, experience, and financial resources-as outlined in the EMP-will be critical. This includes proof of past success with similar biodiversity plans and the assignment of a competent ecological expert.

The Environmental and Social (ES) Unit will conduct regular field inspections (weekly or monthly, depending on the activity) to monitor all mitigation efforts. Details of responsibilities are specified in earlier tables of the BMP.

#### **Reporting Commitments**

Throughout pre-construction and construction, the EPC ecologist and ESMU will submit monthly reports to the PMD/PMU Project Manager. These reports will include updates on environmental progress, QA/QC, financials, contract changes, project delays, and any environmental or social issues, including photos.

Additionally, the PMD/PMU, assisted by the PSC/International Environmental Specialist (IES), will provide quarterly updates to the ADB. Semi-annual Environmental Monitoring Reports (EMRs) will detail BMP, BAP, and EMP compliance, with urgent issues reported immediately. Monthly coordination meetings and regular site inspections by the ESMU and PSC will ensure alignment. An International Ecologist will also submit quarterly reports to ADB on BMP.

### **BMP Updates**

The current BMP was developed based on ecological assessments, the approved Initial Environmental Examination (IEE), and follow-up site visits. If project designs change and affect additional natural habitats, the BMP will be revised accordingly. Any significant changes must follow the PMD/PMU's change management protocols and be reviewed by Environmental Specialist Support consultants as specified in the plan.

## BMMP ANNEXES



## Annex 1: Protocol



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**Annex 1. 1: Biomass Removal Plan/ Protocol**

|                  |                                              |
|------------------|----------------------------------------------|
| <b>Title</b>     | Biomass Removal Plan/Protocol                |
| <b>Objective</b> | Outline methods to undertake biomass removal |

**Biomass Removal Plan**

|                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Section                          | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Objective                        | Biomass Removal Plan                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Use of Best Practices            | Reference to:<br><ul style="list-style-type: none"> <li>■ Titus, B.D., Brown, K., Helmisaari, H.S., Vanguelova, E., Stupak, I., Evans, A., Clarke, N., Guidi, C., Bruckman, V.J., Varnagiryte-Kabasinskiene, I. and Armolaitis, K., 2021. Sustainable forest biomass: A review of current residue harvesting guidelines. Energy, Sustainability and Society, 11, pp.1-32.</li> <li>■ Gregory, A., Spence, E., Beier, P. and Garding, E., 2021. Toward best management practices for ecological corridors. Land, 10(2), p.140.</li> </ul> |
| Priority Objectives              | <ul style="list-style-type: none"> <li>■ Collect maximum commercially valuable timber from Transmission Line areas</li> <li>■ Remove above-ground biomass to reduce collision with line impacts and accident generation</li> </ul>                                                                                                                                                                                                                                                                                                       |
| Biomass Removal Options          | <ul style="list-style-type: none"> <li>■ Do nothing</li> <li>■ Partial biomass removal (salvage logging)</li> <li>■ Complete biomass removal</li> <li>■ Salvage logging + drawdown clearance</li> </ul>                                                                                                                                                                                                                                                                                                                                  |
| Selected Biomass Removal Options | <ul style="list-style-type: none"> <li>■ Residual biomass removal <ul style="list-style-type: none"> <li>- Lesser value biomass extraction (by local communities)</li> <li>- Biomass clearance</li> </ul> </li> </ul>                                                                                                                                                                                                                                                                                                                    |

**Table 2: Salvage Logging Management**

|                                     |                                                                |
|-------------------------------------|----------------------------------------------------------------|
| Role                                | Responsibility                                                 |
| DKJTLP Project Team                 | Coordinate, manage, and monitor all salvage logging operations |
| Logging Contractor                  | Undertake salvage logging operations                           |
| Ministry of Forests and Environment | Ensure compliance with relevant regulations and guidelines     |

**Commercial Viability Assessment:**

- **Highly viable areas:** Commercial harvesting
- **Marginally viable areas:** Partial/subsidized harvesting

**Guidelines to Follow:**

- FAO Forest Harvesting Code of Practice
- Environmental Protection Regulation, 2077
- Ministry of Forests and Environment guidelines

**Residual Biomass Removal Management**

| Role                                | Responsibility                                             |
|-------------------------------------|------------------------------------------------------------|
| DKJTLP Project Team                 | Coordinate, manage, and monitor biomass removal operations |
| Logging Contractor                  | Undertake biomass removal operations                       |
| Ministry of Forests and Environment | Ensure compliance with regulations                         |

**Lesser Value Biomass Extraction**

Materials used for:

- Building
- Firewood
- Charcoal / Biochar
- Recycled products

**Biomass Removal Techniques**

Manual Cutting/Clearing:

- Cutting and leaving on-site
- Cutting, stockpiling, mulching for local/contractor use

## Annex 1. 2: Biodiversity Induction and Training Procedure

|                  |                                                                              |
|------------------|------------------------------------------------------------------------------|
| <b>Title</b>     | Biodiversity Induction and Training Procedure                                |
| <b>Objective</b> | Outline the steps to educate the workforce on protecting biodiversity values |

### Application

|                                                                                                                     |
|---------------------------------------------------------------------------------------------------------------------|
| <b>Details</b>                                                                                                      |
| Applies to all DKJTLP personnel and contractors at or visiting the site                                             |
| All existing personnel must be inducted; refresher training every six months                                        |
| New personnel must be inducted before starting any work                                                             |
| Maintain an attendance register of training and refresher sessions attended                                         |
| Slide deck to be prepared in Nepali and contractor languages                                                        |
| Slide deck must include pictures of species                                                                         |
| Training to be delivered by qualified persons, preferably with involvement of local NGOs and government authorities |
| Induction content to be regularly updated and improved                                                              |

### Training Topics

|                                                                                                       |
|-------------------------------------------------------------------------------------------------------|
| Topics                                                                                                |
| ■ Implementation of anti-illegal logging policy and related sanctions                                 |
| ■ Implementation of “no-poaching and no-hunting” policy and related sanctions                         |
| ■ Awareness of biodiversity values in the project area and potential impacts from construction        |
| ■ Individual responsibilities to reduce biodiversity impacts in line with related procedures such as: |
| – Wildlife Rescue and Reporting Procedure                                                             |
| – Sediment and Erosion Control Procedure                                                              |

### Anti-Illegal Logging Policy Implementation

|                                                                                                        |
|--------------------------------------------------------------------------------------------------------|
| <b>Key Points</b>                                                                                      |
| All personnel must commit to DKJTLP's anti-illegal logging policy                                      |
| Strict “no access” rule for unauthorized personnel, vehicles, and equipment in DKJTLP-controlled areas |
| Aim: Prevent illegal loggers from accessing DKJTLP and adjacent (including protected) areas            |
| Anyone involved in illegal logging will be dismissed and banned from re-employment                     |
| Monitoring measures include:                                                                           |
| – 24-hour vehicle inspections at site entrances                                                        |
| – Random vehicle inspections                                                                           |
| Illegal activity will be reported to authorities                                                       |

|                                                                                                     |
|-----------------------------------------------------------------------------------------------------|
| Species for monitoring will be based on conservation significance as determined in baseline studies |
|-----------------------------------------------------------------------------------------------------|

**No-Poaching and No-Hunting Policy Implementation**

| Key Points                                                                                                                                                                                                                         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DKJTLP enforces a zero-tolerance policy on wildlife and forest product possession                                                                                                                                                  |
| Strict ban on possession, trade, purchase, or collection of: <ul style="list-style-type: none"> <li>– Legally protected species (Nepal Law)</li> <li>– CITES-listed species</li> <li>– IUCN Red List threatened species</li> </ul> |
| Offenders will be dismissed and banned from re-employment                                                                                                                                                                          |
| Monitoring includes: <ul style="list-style-type: none"> <li>– 24-hour vehicle inspections</li> <li>– Random vehicle checks</li> </ul>                                                                                              |
| Offenders will be reported to relevant authorities                                                                                                                                                                                 |

**Awareness of Biodiversity in Project Area**

| Key Briefing Points                                                                          |
|----------------------------------------------------------------------------------------------|
| Include information on local flora and fauna species                                         |
| Highlight critical habitat species and their conservation status (based on baseline studies) |
| Importance of conservation to be emphasized                                                  |
| Include photos of flora and fauna in the training materials                                  |

**Individual Responsibilities to Reduce Biodiversity Impacts**

| Guidelines for Personnel                                                                                                                                            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Proper behavior during animal encounters: <ul style="list-style-type: none"> <li>– Do not provoke</li> <li>– Do not feed</li> <li>– Keep a safe distance</li> </ul> |
| Follow Wildlife Rescue and Reporting Procedure                                                                                                                      |
| Follow Invasive Species Management Procedure                                                                                                                        |
| Report wildlife encounters on site                                                                                                                                  |
| Prevent invasive species transmission through proper actions                                                                                                        |

**Annex 1. 3: Biodiversity Community Engagement Procedure**

|                  |                                                                                           |
|------------------|-------------------------------------------------------------------------------------------|
| <b>Title</b>     | Biodiversity Community Engagement Procedure                                               |
| <b>Objective</b> | Outline measures to engage the community to conserve biodiversity within the project area |

**Application**

|                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Details</b>                                                                                                                                                                                                                                                                                                                                                                                                                     |
| DKJTLP will conduct biodiversity engagement with local communities every 6 months.                                                                                                                                                                                                                                                                                                                                                 |
| Topics include: wildlife protection, poaching, illegal logging, forest product collection, and H&S.                                                                                                                                                                                                                                                                                                                                |
| DKJTLP commits to: <ul style="list-style-type: none"> <li>■ Raise awareness of local habitats and species (including future biodiversity offset areas).</li> <li>■ Discourage illegal activities through proactive dialogue and alternatives.</li> <li>■ Provide forums for questions, concerns, and comments, ensuring inclusive participation.</li> <li>■ Educate the community on legal obligations under Nepal law.</li> </ul> |

**Community Access and Engagement Procedure****1. Government Empowerment**

|                                                                                      |
|--------------------------------------------------------------------------------------|
| <b>Actions</b>                                                                       |
| Engage local government and conservation authorities on logging/clearing activities. |
| Prepare a MoU outlining roles in reporting and enforcing illegal activity.           |
| MoU to reflect DKJTLP's zero tolerance policy on wildlife and forest resources.      |

**2. Intelligence Gathering**

|                                                                                                             |
|-------------------------------------------------------------------------------------------------------------|
| <b>Actions</b>                                                                                              |
| Work with authorities, communities, traders, law enforcement, and others to identify illegal activity.      |
| Visit local markets discreetly (via Nepali locals) to investigate illegal wildlife and timber trade chains. |
| Use intelligence to map stakeholders, access routes, and develop targeted campaigns.                        |

**3. Raising Awareness of Biodiversity & Illegal Activities**

|                                                                                       |
|---------------------------------------------------------------------------------------|
| <b>Actions</b>                                                                        |
| Run biannual workshops to highlight conservation value and threatened species.        |
| Ensure inclusive participation (elders, youth, women, hunters, etc.).                 |
| Conduct school education sessions annually on forest and bird conservation.           |
| Educate communities on the regulatory framework against poaching and illegal logging. |
| Visit every village in the project area at least once every 5 years.                  |

**4. Community Empowerment**

|                                                                                                 |
|-------------------------------------------------------------------------------------------------|
| Actions                                                                                         |
| Identify and hire “paid volunteers” from the community for biodiversity patrols.                |
| Assign local ambassadors to educate their communities using accessible formats (e.g., theatre). |

**5. Fostering Inclusiveness**

|                                                                                        |
|----------------------------------------------------------------------------------------|
| Actions                                                                                |
| Maintain open forums for grievances and feedback, inclusive of vulnerable populations. |
| Keep communities updated on project-related developments (e.g., provision of timber).  |

**6. Livelihood Restoration & Biodiversity Management**

|                                                                                    |
|------------------------------------------------------------------------------------|
| Actions                                                                            |
| Provide training, support, and contacts to help manage biodiversity.               |
| Establish community nurseries for native species with incentives.                  |
| Enable community patrols to monitor biodiversity threats (e.g., snares, poaching). |

**7. Regular Patrols**

|                                                                               |
|-------------------------------------------------------------------------------|
| Actions                                                                       |
| Conduct routine patrols within project areas to detect illegal activity.      |
| Train community rangers/wardens to report infractions and receive incentives. |
| Share findings with relevant conservation authorities for enforcement.        |

**8. Managing Community Access**

|                                                                                     |
|-------------------------------------------------------------------------------------|
| Actions                                                                             |
| Brief community members on safe zones and no-access areas.                          |
| Maintain records for permitted community visits to worksites (check-in/out system). |

**9. Monitoring and Evaluation**

|                                                                                              |
|----------------------------------------------------------------------------------------------|
| Actions                                                                                      |
| Conduct an annual community survey on attitudes towards conservation and illegal activities. |
| Survey results must be submitted to DKJTLP within 1 month of completion.                     |

## Annex I. 4: Site Rehabilitation Plan

|                  |                                                  |
|------------------|--------------------------------------------------|
| <b>Title</b>     | Site Rehabilitation Plan                         |
| <b>Objective</b> | Outline methods to undertake site rehabilitation |

**Site Rehabilitation Plan****1. Use of Best Practices**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Guidelines to Follow                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <ul style="list-style-type: none"> <li>■ Meaux, L.B., 2020. Transmission Line and Substation Project Environmental Assessment and Site Analysis.</li> <li>■ Li, X., Chen, Y., Wang, C., Che, Y., Weng, S. and Chen, Z., 2022, November. Practice of Ecological Restoration of Slope in Power Transmission and Transformation Project. In Proceedings of the 4th International Conference on Advances in Civil and Ecological Engineering Research: ACEER2022 (pp. 125-136). Singapore: Springer Nature Singapore.</li> <li>■ Pedrini, S. and Dixon, K.W., 2020. International principles and standards for native seeds in ecological restoration. Restoration Ecology, 28, pp.S286-S303.</li> </ul> |

**2. Plan Goals (for Natural Habitat)**

|                                                                                                                                                                                                                                                                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ecological Objectives                                                                                                                                                                                                                                           |
| <ul style="list-style-type: none"> <li>■ Enable indigenous species to perform natural functions (breeding, foraging)</li> <li>■ Create habitat for native species</li> <li>■ Establish canopy cover</li> <li>■ Restore diversity of indigenous trees</li> </ul> |

**3. Restoration Planting Strategy**

|                                                                                                                                                                                                                                                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Restoration Priorities                                                                                                                                                                                                                         |
| <ul style="list-style-type: none"> <li>■ Focus on significant remnant forest patches (even if degraded)</li> <li>■ Promote natural regeneration (e.g., through IAS control)</li> <li>■ Use tree planting to assist natural recovery</li> </ul> |

**4. Pre-planting Surveys**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Key Data to Collect                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <ul style="list-style-type: none"> <li>■ Site conditions: degradation, terrain, soil fertility, microclimate</li> <li>■ Scale of effort: area, number of plants</li> <li>■ Budget and timeframe (e.g., intensive vs. phased planting)</li> <li>■ Technical &amp; human resources (in-house or outsourced)</li> <li>■ Community involvement</li> <li>■ Plant material sourcing (nurseries, seeds, location, survival rates)</li> <li>■ Machinery feasibility and nursery establishment options</li> </ul> |
| Reference Survey                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

|                                                                                                               |
|---------------------------------------------------------------------------------------------------------------|
| Conduct a reference survey in a nearby undisturbed natural area to guide expected outcomes for rehabilitation |
|---------------------------------------------------------------------------------------------------------------|

**5. Succession Planting Strategy**

|                                                                                                                                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Phased Planting Approach                                                                                                                                               |
| <ul style="list-style-type: none"> <li>■ First plant pioneer species</li> <li>■ Once pioneers are established, introduce climax species beneath their shade</li> </ul> |

**6. Planting Pattern**

|                                                                                                                                                                                                                             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Line Planting Method                                                                                                                                                                                                        |
| <ul style="list-style-type: none"> <li>■ Recommended for areas lacking original tree cover</li> <li>■ Row spacing: 2–4 meters</li> <li>■ Density target: ~3,100 regenerates per hectare (~1.8 m average spacing)</li> </ul> |

**7. Maintenance Regime**

|                                                                                |
|--------------------------------------------------------------------------------|
| Note                                                                           |
| Rehabilitation maintenance to be conducted in accordance with given references |

**8. Monitoring and Evaluation**

| Monitoring Types                     | Purpose                                                                                                                                         |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Operational Monitoring               | Track implementation of restoration activities and responsibilities. Frequent intervals recommended.                                            |
| Strategic & Effectiveness Monitoring | Evaluate if objectives are being met using indicators (e.g., vegetation cover, biodiversity).                                                   |
| Threats Monitoring                   | Assess risks that may compromise restoration (e.g., invasive species, erosion, grazing). Indicators to be developed based on threat assessment. |

**Rehabilitation Maintenance Regime**

| No. | Activity                                  | Methods                                                                                                                                                | Frequency                   | Inputs                                                                                                                 |
|-----|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|------------------------------------------------------------------------------------------------------------------------|
| 1   | Additional planting to replace dead trees | <ul style="list-style-type: none"> <li>■ In-filling with new seedlings/saplings</li> </ul>                                                             | When required               | <ul style="list-style-type: none"> <li>■ Labor</li> <li>■ Planting materials</li> <li>■ Machinery and tools</li> </ul> |
| 2   | Removal of weeds and invasive species     | <ul style="list-style-type: none"> <li>■ Manual removal, slashing, pressing</li> <li>■ Use herbicides in severe cases</li> </ul>                       | Every 3 months or as needed | <ul style="list-style-type: none"> <li>■ Labor</li> <li>■ Machinery and tools</li> <li>■ Herbicides</li> </ul>         |
| 3   | Protection from encroachment              | <ul style="list-style-type: none"> <li>■ Site patrolling</li> <li>■ Cautioning offenders</li> <li>■ Report serious cases to law enforcement</li> </ul> | Daily                       | <ul style="list-style-type: none"> <li>■ Labor</li> <li>■ Protection &amp; communication equipment</li> </ul>          |

**Annex****Biodiversity Management Plan**

|          |                                            |                                                                                                    |                                                           |                                                          |
|----------|--------------------------------------------|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------|----------------------------------------------------------|
| <b>4</b> | Prevention of damage by wildlife/livestock | ■ Fence site boundary<br>■ Use nets/barriers around seedlings<br>■ Daily patrols to inspect fences | Fence installation: At project start<br>Patrolling: Daily | ■ Labor<br>■ Fencing and netting materials               |
| <b>5</b> | Application of fertilizer                  | ■ Prefer organic fertilizers like manure<br>■ Focus on seedlings <1.5 m tall                       | During critical growth stages                             | ■ Organic/chemical fertilizers                           |
| <b>6</b> | Irrigation                                 | ■ Drip, sprinkler, or manual depending on site and budget                                          | As required                                               | ■ Labor<br>■ Irrigation/watering system                  |
| <b>7</b> | Monitoring                                 | ■ As per methods in Monitoring & Evaluation section                                                | As per monitoring plan                                    | ■ Labor<br>■ Monitoring tools (e.g., forms, GPS, camera) |

## Annex 1. 5: Injured and/or Distressed Wildlife Management Protocol

**Objective:** Guide for responding to injured/distressed wildlife during project activities (construction/operation)

**Applicability:**

For small/medium wildlife within project area

**Wildlife Response Protocol**

| Event                                    | Action                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Discovery of injured/distressed wildlife | <ul style="list-style-type: none"> <li>■ Record date, time, location, condition, with photos</li> <li>■ Stop work nearby</li> <li>■ Observe from a safe distance</li> <li>■ If not in danger, wait for it to leave</li> <li>■ If in danger, assess safe capture options</li> <li>■ Notify relevant authorities and arrange same-day transfer</li> </ul>                                         |
| Preparation for containment              | <ul style="list-style-type: none"> <li>■ Equip staff with gloves, towel/gunny sack</li> <li>■ Keep vehicle ready for transport</li> </ul>                                                                                                                                                                                                                                                       |
| Management (small/medium animals)        | <ul style="list-style-type: none"> <li>■ Use covered box/cage with soft lining</li> <li>■ Handle gently; approach slowly</li> <li>■ Wrap with towel to cover body and head</li> <li>■ Keep quiet to reduce stress</li> </ul>                                                                                                                                                                    |
| Treatment                                | <ul style="list-style-type: none"> <li>■ Transfer to authorities ASAP</li> <li>■ If overnight care needed: Keep in dark, ventilated, secure box; do not feed or handle</li> <li>■ Discard used boxes or sterilize reusable cages</li> <li>■ All staff: wash hands and clothes after handling</li> </ul>                                                                                         |
| Post-Incident                            | <ul style="list-style-type: none"> <li>■ Follow up with authorities</li> <li>■ Senior Environment Executive to: <ul style="list-style-type: none"> <li>– Investigate cause</li> <li>– Interview staff</li> <li>– Identify preventive measures</li> </ul> </li> <li>■ Record actions in BMP change and incident logs</li> <li>■ Share findings with all staff during toolbox meetings</li> </ul> |

**Incident Reporting Form**

|                    |  |
|--------------------|--|
| Submission Details |  |
| Name:              |  |



*[Signature]*

**Annex****Biodiversity Management Plan**

|                  |                                                                                                                                                        |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Designation:     |                                                                                                                                                        |
| Date:            |                                                                                                                                                        |
| Type of Incident | <input checked="" type="checkbox"/> Wildlife <input type="checkbox"/> Sighting <input type="checkbox"/> Injury/Roadkill <input type="checkbox"/> Other |
| Health & Safety  | <input type="checkbox"/>                                                                                                                               |
| Illegal Activity | <input type="checkbox"/>                                                                                                                               |

|                                        |                               |
|----------------------------------------|-------------------------------|
| Incident Details                       |                               |
| Date:                                  |                               |
| Time:                                  |                               |
| Location/GPS:                          |                               |
| Description of Incident:               | (Include photos if available) |
| Eyewitnesses:                          |                               |
| Condition of Animal & Suspected Cause: | (Include photos if available) |
| Action Taken                           |                               |
| Action & Date:                         |                               |
| Involved Personnel:                    |                               |
| Forest Department Contact:             |                               |

## INJURED WILDLIFE PROTOCOL

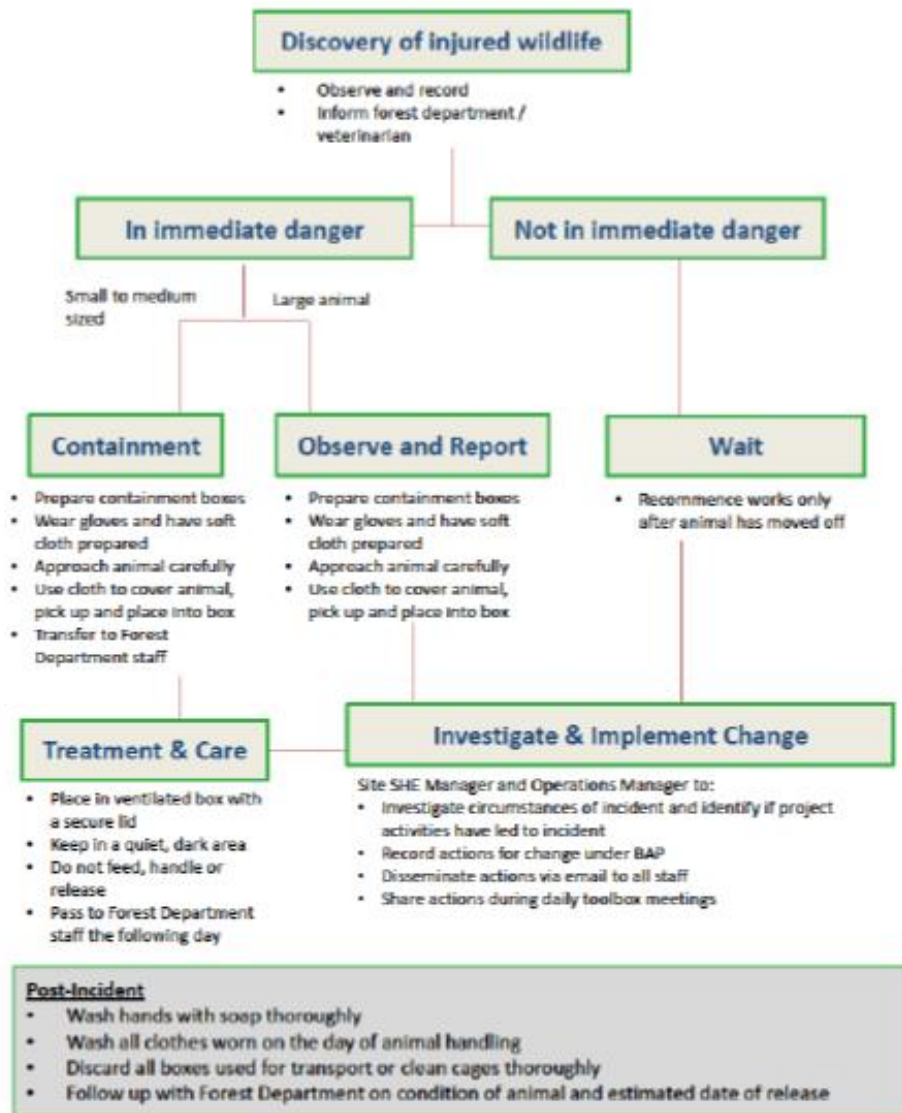


Figure 1: Chart of injured wildlife protocol

### Incident Reporting Communication Chain Form

| Designation                 | Name & Address (if applicable) | Contact Number |
|-----------------------------|--------------------------------|----------------|
| Senior Manager              |                                |                |
| SHE Site Manager            |                                |                |
| Process Senior Executive    |                                |                |
| Security Supervisor         |                                |                |
| Forest Department Warden 1  |                                |                |
| Forest Department Warden 2  |                                |                |
| Veterinarian                |                                |                |
| Police Department Officer 1 |                                |                |
| Police Department Officer 2 |                                |                |
| Hospital                    |                                |                |

### Key Steps of Incident Communication and Response

#### 1. Immediate Notification

Upon any incident (wildlife, safety, or illegal activity), the SHE Site Manager must be notified immediately with:

Type of incident

Location

Brief description

#### 2. Tier 1- Response Activation

Wildlife Incident: SHE Site Manager → Process Senior Executive

Decision: Halt work, cordon off area

Health & Safety Incident: SHE Site Manager → Process Senior Executive

Decision: Halt work, cordon off area

Illegal Activity Incident: SHE Site Manager → Security Supervisor

Decision: Secure site, detain suspects if necessary

#### 3. Tier 2- Escalation (If Needed)

Based on incident severity, the following actions may be taken:

Wildlife Incident:

Contact Forest Wardens or Veterinarian

Health & Safety Incident:

Contact Hospital to prepare for incoming casualty

#### Illegal Activity:

Notify Forest Wardens or Police if:

Poaching/logging is confirmed

Suspects are aggressive or crime is prosecutable

#### 4. Tier 3- Escalation (If Critical)



For serious or dangerous incidents, escalate to Police or other relevant authorities as required

#### 5. Reporting and Review

SHE Site Manager: Leads the incident reporting process

Senior Manager: Reviews the report and approves corrective actions (if impact on project is minimal)



## Annex 1. 6: Erosion Control Procedure

|                  |                                                                           |
|------------------|---------------------------------------------------------------------------|
| <b>Title</b>     | <b>Erosion Control Procedure</b>                                          |
| <b>Objective</b> | Outline measures to reduce impacts from soil erosion impacts by tower pad |

### Application

The following erosion control procedure is to apply to all project area components during construction and operation.

### Erosion Control Procedure

| <b>Objective</b>        | <b>Erosion Control Procedure</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Use of best practices   | <p>Reference to the following best practices are to be made for erosion control activities:</p> <ul style="list-style-type: none"> <li>■ Hedges, B. and Bodington, A., 2004, March. A comparison of monitoring techniques for improved erosion control: A field study. In <i>NACE CORROSION</i> (pp. NACE-04355). NACE.</li> <li>■ Li, L., Xin, H.X., Xiaofeng, C., Xi, C. and Qian, H., 2021, August. Research on key technology of soil erosion control of transmission line project in Hilly Area. In <i>IOP Conference Series: Earth and Environmental Science</i> (Vol. 831, No. 1, p. 012007). IOP Publishing.</li> <li>■ Kumarasinghe, U., 2021. A review on new technologies in soil erosion management. <i>Journal of research technology and engineering</i>, 2(1), pp.120-127.</li> </ul>                                                                                                                                                                                                                                             |
| Management of tower pad | <p>All tower pads are to be subject to a detailed engineering design.</p> <ul style="list-style-type: none"> <li>■ All disturbed soil surfaces are to be rehabilitated immediately after the contractor completes the work.</li> <li>■ Any fill material used for tower pad construction is to be compacted according to required engineering standards.</li> <li>■ Tower pads are to be constructed and cut into the slope to avoid the use of fill batters. Where fill batters are used, they must be stabilized using appropriate sediment and erosion control best practices outlined in the standards above.</li> <li>■ Excess fill is to be transported to an appropriate fill location. Fill material must not be disposed of over batters.</li> <li>■ All drains are to be armored within 10 meters of a drainage feature crossing.</li> <li>■ All drainage feature crossings must be designed to convey a storm size of at least 1:10 year event.</li> <li>■ Soil must not be placed within the bed and banks of a waterway.</li> </ul> |
| Erodible soils          | <p>All erodible soils are to be identified in the field prior to disturbance Where erodible soils are identified surface stabilization measures are to be used, including (but not limited to):</p> <ul style="list-style-type: none"> <li>■ <u>Mulch</u>: Apply to ground or slope surface as an erosion prevention measure that aids in plant growth and revegetation. On steep slopes and critical areas near waterbodies, mulch matting should be used with netting or anchoring to secure it.</li> <li>■ <u>Matting</u>: Matting or erosion control blankets (ECBs) provide protection against surface runoff. Matting and ECBs should be made of fully biodegradable material.</li> <li>■ <u>Plastic sheeting</u>: Apply to ground or slope surface as an erosion prevention measure.</li> </ul>                                                                                                                                                                                                                                           |
| Spoil disposal          | <ul style="list-style-type: none"> <li>■ All spoil disposal areas are to be subject to a detailed engineering design – only areas identified in the IEE and approved by the World Bank and the Nepal Ministry of Forests and Environment can be used for spoil disposal.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                           | <ul style="list-style-type: none"> <li>■ All spoil disposal areas are to be rehabilitated as soon as practicable using a cover crop and native flora.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                     |
| Monitoring and evaluation | <ul style="list-style-type: none"> <li>■ A maintenance program should include daily routine checks, repairs and replacements.</li> <li>■ Erosion control measures must remain in place and be maintained in functional condition until the site is stabilized with vegetation.</li> <li>■ Inspections are to identify areas that require erosion control for rectification immediately.</li> <li>■ Inspection records containing compliance to the procedure, non-compliance and correction actions are to be maintained.</li> </ul> |

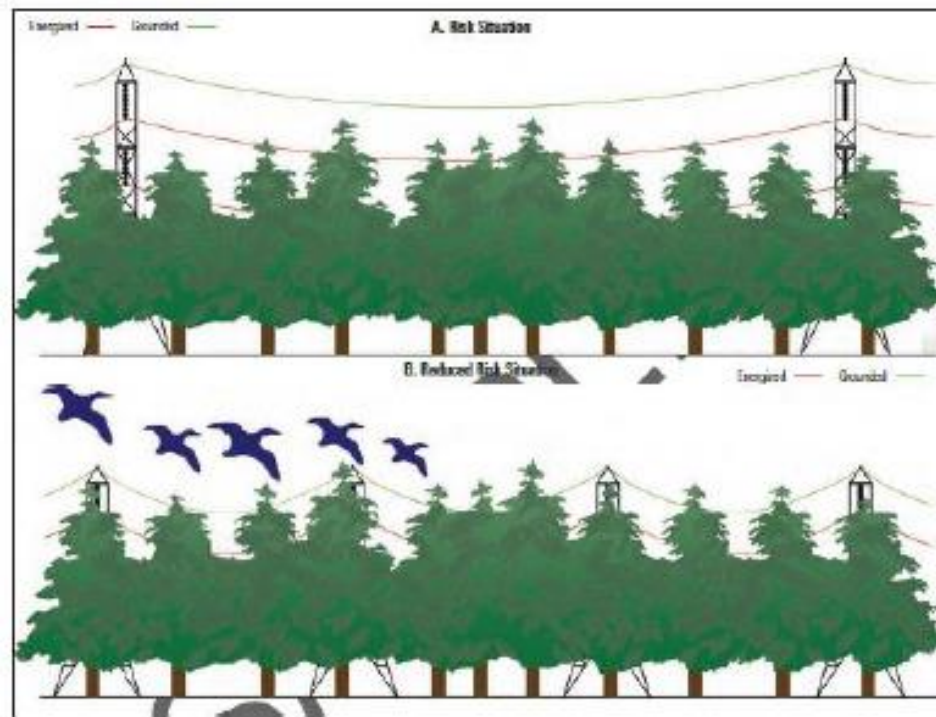
## **Annex 2: Bird mitigation procedure**

## Reducing Avian Collisions with Power Lines

This annex outlines technical and design measures aimed at reducing avian collisions with power lines during both the construction and operational phases of the project. The guidance is based on standards recommended by the Avian Power Line Interaction Committee (APLIC), 2019, and is an integral part of ensuring avian-friendly infrastructure in transmission line development.

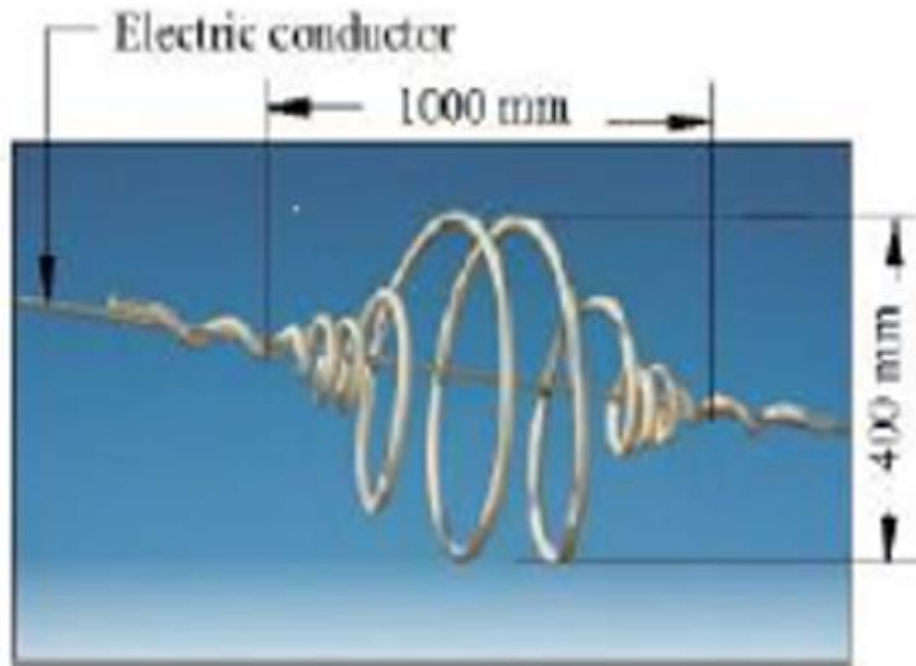
The **primary objective** of this annex is to manage and minimize the risk of bird collisions through strategic planning and design interventions. Key standards include:

- **Using bird diverter**



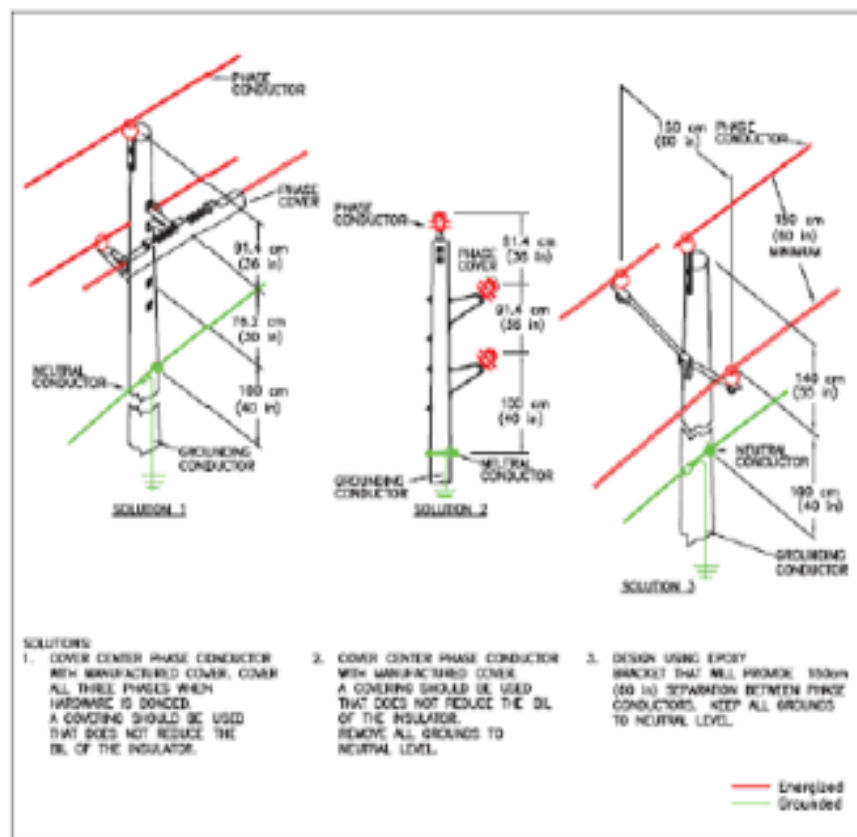
**Figure 1.1:** Structure of TLP to reduce avian

Install visibility enhancement objects such as marker balls, bird deterrents, bird flight diverters, suspended devices, solar-powered reflectors, and/or aerial marker spheres (typically 30 cm in diameter) on static lines to increase line visibility to birds and reduce bird-line collisions, especially where lines cross known flyways (Figures I.2 and I.3). The size and type of deterrent should be selected based on terrain characteristics, forest type, the target bird species, and the potential for corona discharge.



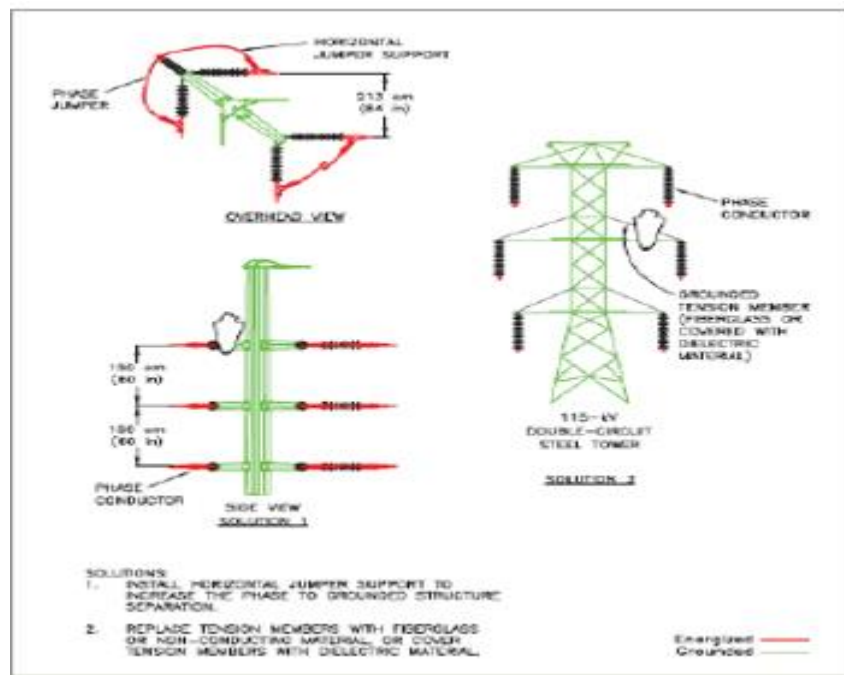
**Figure 1.2: Bird Diverter**

Maintain 1.5 m separation between energized conductors or energized and grounded hardware or, where spacing is not feasible, cover energized parts and hardware (Figures 1.4, 1.5, and 1.6).



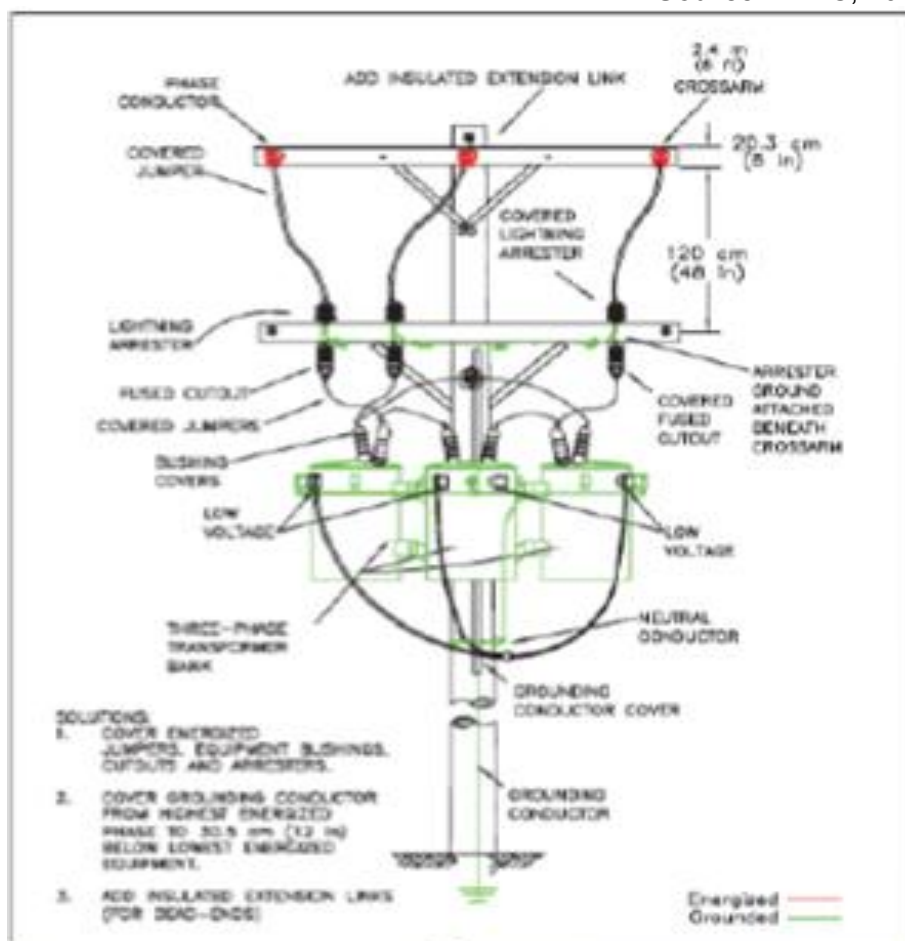
**Figure 1.4: Avian-safe three-phase design**

**Source:** APLC, 2019



**Figure 1.5: Avian-safe Transmission Tower Design**

**Source:** APLC, 2019



**Figure 1.6: Avian-safe Phase Transformer Bank**

**Source:** APLC, 2019

Provide measures to deter raptors from perching on transmission line structures (e.g., perch guards) in designated areas or provide platforms for safe perching/nesting.

### **Annex 3: Critical Species List**

**Table 3.1: Critical Species List (CSP)**

| S. N. | Common/<br>Scientific Name                         | Photograph                                                                          | Key features                                                                                                                                                                                                                                                                                                                                                                                                            | Status         |
|-------|----------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| 1     | White-rumped vulture<br><i>Gyps bengalensis</i>    |    | It has been listed as Critically Endangered on the IUCN Red List since 2000, as the population severely declined.<br>White-rumped vultures die of kidney failure caused by diclofenac poisoning.<br>As of 2021, the global population was estimated at less than 6,000 mature individuals.<br>It weighs 3.5–7.5 kg (7.7–16.5 lb), measures 75-93 cm (30–37 in) in length, and has a wingspan of 1.92–2.6 m (6.3–8.5 ft) | Present        |
| 2     | Slender-billed vulture<br><i>Gyps tenuirostris</i> |   | It is Critically Endangered since 2002 as the population on the Indian subcontinent has declined rapidly.<br><br>At 80 to 95 cm, in length, this mid-sized vulture.                                                                                                                                                                                                                                                     | Present        |
| 3     | Himalayan Monal<br><i>Lophophorus impejanus</i>    |  | A strikingly colorful pheasant native to the Himalayan region. It inhabits high-altitude forests and alpine meadows, typically between 2,100 - 4,500 meter.<br>The species is currently listed as Least Concern by the IUCN.<br>Holds cultural importance in Himalayan communities                                                                                                                                      | Present        |
| 4     | Rara paa frog<br><i>Nanorana rarica</i>            |  | It is known from the Lake Rara at an elevation of about 3,000 m (9,800 ft) above sea level, and is associated with tropical montane forest.<br>The habitat and ecological requirements of this species are poorly known, One specimen was found along the outlet stream called Nijar Khola that runs slowly through the Majghatta, Murma village, Near rara lake                                                        | May be present |

|   |                                               |                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                |
|---|-----------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| 5 | Dubois' paa frog<br><i>Nanorana rostandi</i>  |    | <p>A species of frog in the family Dicroglossidae. It is endemic to western Nepal. It is a rare species found near high-altitude streams, springs, and other running waters within forests and grasslands. It is threatened by <a href="#">habitat loss</a> due to subsistence wood collecting.</p> <p><b>Conservation status</b></p> <p>Extinct (EX) Threatened (EW, CR, EN, <b>VU</b>, NT) Least Concern (LC)</p> <p>Vulnerable (IUCN 3.1)<sup>[1]</sup></p> | Present        |
| 6 | Nepal lazy toad<br><i>Scutiger nepalensis</i> |    | <p>Its natural habitats are subtropical or tropical high-altitude grassland and rivers. It is threatened by habitat loss.</p>                                                                                                                                                                                                                                                                                                                                  | May be Present |
| 7 | Dragonflies<br><i>Somatochlora nepalensis</i> |   | <p>Found in Nepal and surrounding Himalayan regions. Occurs in high-altitude streams, ponds, and slow-flowing rivers, often between 1,000–3,000 m above sea level. Adults are aerial hunters, feeding on mosquitoes, midges, and other flying insects. IUCN Red List: Data Deficient (due to limited research).</p>                                                                                                                                            | Present        |
| 8 | Red Panda<br><i>Ailurus fulgens</i>           |  | <p>Inhabits coniferous forests as well as temperate broadleaf and mixed forests, favouring steep slopes with dense bamboo cover close to water sources. It is threatened by poaching as well as destruction and fragmentation of habitat due to deforestation. The species has been listed as Endangered on the IUCN Red List since 2015.</p>                                                                                                                  | Present        |

|    |                       |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |         |
|----|-----------------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| 9  | <i>Sorea Robusta</i>  |   | <p>It can grow up to 50 metres tall in fertile soils, but is more likely to be 20 - 25 metres tall in poorer soils. The straight, cylindrical bole can be unbranched for up to 25 metres and up to 200cm in diameter. It yields a resin that is traded and an oil that is used locally as well as being exported in large quantities. It addition, it supplies tannins, an edible seed and medicines for local use. The leaves are used commercially for making plates and containers.</p> | Present |
| 10 | <i>Taxus Contorta</i> |  | <p>The total extent of occurrence is in excess of 20,000 km<sup>2</sup>. However, it is likely to be less than 2,000 km<sup>2</sup> now its occurrence.</p>  <p>Bark, leaves and twigs have a range of traditional medicinal uses and are also used for the commercial production of Taxol, an anti-cancer drug.</p>                                                                                     | Present |

## **Annex 4: Mitigation Measures Procedure**



## I. Mitigation Measures Procedure for Frogs (*Nanorana rarica*, *Nanorana rostandi*, *Scutiger nepalensis*) in DKJ Transmission Line Project

### 1. Background

These frog species are sensitive to habitat disturbance, especially during their breeding season. Construction activities such as clearing, earthworks, and conductor installation can affect their breeding sites, calling areas, and migration paths. The protocol aims to minimize impacts and support the conservation of these species.

### 2. Timing Restrictions

Avoid construction and conductor installation in known breeding habitats during the breeding season:

Breeding season: Typically between May and July (confirm local timing with experts).

No heavy earthworks, clearing, or conductor installation within or within 500 meters of breeding habitats during this period.

If unavoidable, restrict work to daylight hours to minimize disturbance.

### 3. Pre-Construction Surveys

Conduct detailed herpetofauna surveys to identify breeding sites, calling areas, and migration corridors at least 1 month before construction.

Mark sensitive zones on construction maps for protection and monitoring.

Engage amphibian experts for guidance on sensitive periods and critical habitats.

### 4. Construction Phase Measures

Habitat Protection:

Fence off breeding pools, streams, and moist habitats with temporary barriers to prevent accidental disturbance.

Avoid clearing vegetation near breeding sites to maintain microhabitats and shade.

Conductor Installation Specifics:

Schedule conductor stringing and installation outside peak breeding season wherever possible.

When working near streams or wetlands, use non-intrusive methods and avoid working at night when frogs are most active.

Install erosion and sediment controls to prevent siltation of breeding pools.

Noise and Vibration Control:

Use quieter equipment and minimize heavy machinery operation near breeding sites.

Limit noisy activities to daytime hours only.

Waste and Pollution Management:

Prevent chemical spills and manage construction waste carefully to avoid contamination of aquatic habitats.

Worker Training:

Train workers to recognize target frog species and habitats, emphasizing the importance of minimizing disturbance.

Establish a reporting protocol if injured or dead amphibians are found.

### 5. Operation Phase Measures

Habitat Maintenance:

Preserve vegetation buffers around known breeding sites and migration corridors.

Regularly inspect for habitat degradation or invasive species that may threaten frog populations.

**Monitoring:**

Conduct annual amphibian population monitoring during breeding seasons for at least 3 years post-construction to assess impacts.

Use results to adapt mitigation as needed.

**Minimize Disturbance from Maintenance Activities:**

Schedule line maintenance outside breeding season when possible.

Use manual clearing techniques rather than heavy machinery near sensitive sites.

**6. Emergency Response**

Develop protocols for accidental injury or habitat damage incidents involving frogs, including immediate reporting and rescue measures in coordination with local wildlife authorities.

**7. Community Engagement**

Inform local communities about the importance of these frog species and involve them in conservation awareness activities to reduce poaching or habitat destruction.

## II. Mitigation Measures Protocol for *Samatochlora nepalensis* in DKJ Transmission Line Project

### 1. Background

*Samatochlora nepalensis* is an aquatic insect species dependent on clean, undisturbed freshwater habitats such as streams, ponds, and wetlands. Its survival can be threatened by habitat loss, pollution, and disturbance during construction and operation activities.

### 2. Timing Restrictions

Avoid construction and conductor installation activities near known habitats during the critical life stages, typically in the warmer months (April to September).

Conduct activities outside peak emergence or breeding times wherever possible.

### 3. Pre-Construction Surveys

Conduct detailed surveys at least 1 month before construction to identify key habitats such as breeding pools, streams, and riparian zones.

Map critical habitats and mark buffer zones for protection during construction.

### 4. Construction Phase Measures

Habitat Protection:

Establish and maintain a buffer zone of at least 30 meters around aquatic habitats (streams, ponds).

Avoid removing riparian vegetation which provides essential shade and prey habitat.

Sediment and Erosion Control:

Implement erosion control measures like silt fences and sediment traps to prevent sediment runoff into water bodies.

Stabilize disturbed soils quickly with vegetation or mulching.

Water Quality Management:

Prohibit dumping or spillage of chemicals, oil, or waste into or near aquatic habitats.

Monitor water quality regularly during construction.

Noise and Vibration Minimization:

Limit heavy machinery use near water bodies during sensitive periods.

Conductor Installation:

Schedule installation activities away from breeding or emergence times.

Use low-impact methods near streams or wetlands to avoid habitat disturbance.

Worker Awareness and Training:

Train workers to recognize *S. nepalensis* habitats and report any sightings or impacts.

Prohibit unnecessary disturbance of aquatic habitats.

### 5. Operation Phase Measures

Habitat Preservation:

Maintain riparian vegetation and water quality in the area throughout operation.

Prevent encroachment or pollution near known habitats.

Monitoring:

Conduct periodic surveys of *S. nepalensis* populations and habitat conditions annually for at least 3 years after construction.

Adapt management practices based on monitoring results.

Maintenance Work:

Schedule transmission line and right-of-way maintenance outside critical life stages.

Use manual vegetation clearing near aquatic habitats to reduce disturbance.

#### **6. Emergency Response**

Develop a response plan for any accidental habitat damage or contamination incidents affecting aquatic habitats.

Report and remediate any impact on *S. nepalensis* populations in coordination with local environmental authorities.

#### **7. Community Involvement**

Educate local communities about the importance of clean freshwater habitats and species like *S. nepalensis*.

Encourage community participation in habitat protection efforts.

1.

### III. Mitigation Measures Protocol for Red Panda (*Ailurus fulgens*) in DKJ Transmission Line Project

#### 1. Background

The red panda is a vulnerable mammal species inhabiting temperate forests with dense bamboo undergrowth in the Himalayan region. It is sensitive to habitat fragmentation, disturbance, and human activities such as construction.

#### 2. Timing Restrictions

Avoid construction activities within red panda habitats during critical periods such as breeding season (January to March) and cub rearing. Schedule noisy or disruptive activities outside dawn and dusk when red pandas are most active.

#### 3. Pre-Construction Surveys

Conduct detailed surveys and habitat mapping to identify red panda presence, feeding sites, resting trees, and movement corridors at least 1 month before construction.

Mark sensitive areas as no-go zones on construction maps.

#### 4. Construction Phase Measures

Habitat Protection:

Avoid clearing or disturbance of bamboo undergrowth and mature trees in identified habitats and corridors.

Establish buffer zones (minimum 100 m) around key habitat patches.

Noise and Disturbance Control:

Limit heavy machinery use near habitats, especially during dawn and dusk.

Restrict construction activities to daylight hours.

Waste and Pollution Management:

Properly manage construction waste to avoid attracting scavengers or polluting the habitat.

Worker Training:

Educate workers on red panda ecology and conservation importance.

Prohibit hunting, feeding, or disturbing wildlife.

Movement and Access:

Limit new road or trail construction to the minimum necessary and avoid fragmentation of habitats.

#### 5. Operation Phase Measures

Habitat Maintenance:

Maintain vegetation corridors and bamboo patches to ensure connectivity.

Monitor for invasive species or habitat degradation.

Monitoring:



Conduct regular monitoring of red panda populations and habitat condition during operation phase.

Adapt mitigation as needed based on findings.

Minimize Disturbance from Maintenance Activities:

Schedule line maintenance outside red panda active hours.

Use manual clearing near habitats.

#### **6. Emergency Response**

Prepare a response protocol for incidents such as injury to animals, habitat destruction, or fire in the project area.

Coordinate with local wildlife authorities for rescue and rehabilitation.

#### **7. Community Engagement**

Raise awareness among local communities about the importance of red pandas and their habitats.

Involve communities in monitoring and protection efforts.



#### IV. Mitigation Measures Protocol for *Taxus contorta* in DKJ Transmission Line Project

##### 1. Background

*Taxus contorta* is an endangered medicinal tree species valued for its anticancer compounds and ecological importance. It grows in temperate forest zones, often in steep and fragile habitats sensitive to disturbance.

##### 2. Pre-Construction Survey and Mapping

Conduct detailed surveys to identify *Taxus contorta* individuals and populations within the project corridor. Mark their locations and create buffer zones (minimum 50 m) around significant individuals or groves.

##### 3. Construction Phase Measures

Avoid direct cutting or removal of *Taxus contorta* trees whenever possible.

If removal is unavoidable, ensure proper compensation through replanting or assisted regeneration nearby.

Restrict construction activities and machinery movement in marked buffer zones.

Control soil erosion and runoff to protect root zones and prevent habitat degradation.

##### 4. Operation Phase Measures

Protect existing trees and prevent damage from maintenance activities.

Implement regular monitoring of tree health and habitat condition.

Promote natural regeneration and, if possible, active restoration through planting seedlings.

##### 5. Community and Stakeholder Engagement

Involve local communities in conservation awareness programs about *Taxus contorta*.

Support alternative livelihood programs to reduce pressure on natural populations.

## Appendix 6: Environmental Monitoring Plan

**Table A6-1. General Environmental Monitoring Plan (EMoP) for all Project Components  
TL AND SS**

| Project Activity or Environment Impacts/ Risks | Monitoring Parameters                                      | Method of Monitoring including Standards/ Guidelines                                                                                                                 | Frequency and Timing                                                                                         | Location/ Components                   | Performance Indicator                                                                                                                 | Implementation                                                                                                             | Supervision (NEA PMU)                                                                                 |
|------------------------------------------------|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| <b>Pre-construction</b>                        |                                                            |                                                                                                                                                                      |                                                                                                              |                                        |                                                                                                                                       |                                                                                                                            |                                                                                                       |
| Statutory Clearances                           | Licenses / Permits and Insurances                          | Review of all applicable clearances, licenses, permits and insurances before the start of construction                                                               | One time prior to the start of construction                                                                  | In general, for all project components | All relevant permits, licenses and insurances outlined in the IEE are obtained prior to the start of works.                           | EPC contractor to undertake monitoring and report to NEA in monthly and quarterly reports with copies attached.            | Review all clearances, licenses, permits and insurances and document compliance in EMR                |
| Staffing                                       | Contractors environmental, social, health and safety staff | Review of staff contracts, timesheets and payslips                                                                                                                   | Prior to the start of construction then periodically throughout construction                                 | In general, for all project components | All staff outlined in the IEE are in place at the start of construction and are on site for the allotted periods specified in the EMP | EPC contractor to undertake monitoring and report to NEA in monthly and quarterly progress reports with evidence attached. | Review contracts, timesheets and payslips and document compliance in EMR                              |
| Training and Inductions                        | Training records                                           | Review of all induction training records, including training materials, attendance sheets and photographs. Attendance at sample of sessions and randomized sample of | One time prior to the start of construction. Then periodically through construction to ensure new staff have | In general, for all project components | All people on-site whether formally or informally employed have received the required training and induction.                         | EPC contractor to undertake monitoring and report to NEA in monthly and quarterly progress reports with evidence attached. | Review all training and induction records, attendance at sample of sessions, sample of people on site |

| Project Activity or Environment Impacts/ Risks | Monitoring Parameters                                                           | Method of Monitoring including Standards/ Guidelines                                                                                                                                                                     | Frequency and Timing                                                                          | Location/ Components                                                                                                                                               | Performance Indicator                                                                                             | Implementation                                                                                                                                                            | Supervision (NEA PMU)                                                                                                         |
|------------------------------------------------|---------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
|                                                |                                                                                 | people on site to assess if they have received training and induction.                                                                                                                                                   | received induction training and refreshers are being delivered.                               |                                                                                                                                                                    |                                                                                                                   |                                                                                                                                                                           | and document compliance in EMR                                                                                                |
| Community Awareness                            | Pre-construction and pre-operation awareness documents                          | Review documents prepared for community awareness activities, attendance sheets and photographs of meetings held to deliver them. Randomized sample of residents to assess if they have received any awareness materials | One time prior to the start of construction and again during commissioning prior to operation | In general, for all project components                                                                                                                             | Awareness documents completed and distributed to adjacent villages within 500m                                    | EPC contractor to undertake monitoring and report to NEA in monthly and quarterly progress reports with evidence attached.                                                | Review awareness documents, attendance at sample of sessions held, conduct sample of residents and document compliance in EMR |
| Environmental management                       | Incident reporting system including GRM and environmental management provisions | Review of incident reporting system including GRM, inspection audit of environmental management provisions by environment safeguard staff                                                                                | Prior to the start of construction then periodically throughout construction                  | For all project components, in particular at TL, SS, DC and DRC all construction areas and related facilities, labour camps and overnight accommodation areas etc. | System established and contract is fully compliance with EMP requirements, GON legislation and IFC EHS Guidelines | EPC contractor to undertake monitoring and report to NEA in monthly and quarterly progress reports with evidence attached including environment officer's checklists etc. | Review of contractor's system and audit, inspection audit by PISC environment expert and document compliance in EMR           |
| Labor Camps                                    | GON legislation,                                                                | Inspection audit of                                                                                                                                                                                                      | Prior to the                                                                                  | For all project                                                                                                                                                    | Labor camps and                                                                                                   | EPC contractor to                                                                                                                                                         | Review of                                                                                                                     |

| Project Activity or Environment Impacts/ Risks                                                          | Monitoring Parameters                                                                                                        | Method of Monitoring including Standards/ Guidelines                                                                             | Frequency and Timing                                                         | Location/ Components                                                                                                           | Performance Indicator                                                                                                                                                                | Implementation                                                                                                                                                    | Supervision (NEA PMU)                                                                                               |
|---------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| and Overnight Accommodation , Sanitation and Welfare Facilities                                         | ILO Safety and Health in construction and guidance on worker accommodation , and IOM migrant workers accommodation checklist | labor camps and overnight accommodation by labor staff.                                                                          | start of construction then periodically throughout construction              | components, all labor camps and overnight accommodation areas as well as day rest areas                                        | overnight accommodation are compliant with EMP requirements, GON legislation, ILO guidance and IOM checklist                                                                         | undertake monitoring and report to NEA in monthly and quarterly progress reports with their labor officer's inspection audit and other evidence attached.         | contractor's audit, inspection audit by PISC labor expert, and document compliance in EMR                           |
| Health and Safety                                                                                       | Health and Safety Risk Assessment, Incident Reporting System including labor GRM and H&S provisions                          | Review of risk assessment and incident reporting system including GRM, inspection audit of H&S provisions by H&S safeguard staff | Prior to the start of construction then periodically throughout construction | For all project components, all construction areas and related facilities, labour camps and overnight accommodation areas etc. | Risk assessment completed, system established, and contract is fully compliance with EMP requirements, GON legislation, IFC EHS Guidelines and ILO Safety and Health in Construction | EPC contractor to undertake monitoring and report to NEA in monthly and quarterly progress reports with evidence attached including H&S officer's checklists etc. | Review of contractor's system and audit, inspection audit by PISC environment expert and document compliance in EMR |
| Construction including Site Establishment, Preparation and Clearance Works and Commissioning Activities |                                                                                                                              |                                                                                                                                  |                                                                              |                                                                                                                                |                                                                                                                                                                                      |                                                                                                                                                                   |                                                                                                                     |
| Health and Safety incidents                                                                             | Records of health and safety incidents                                                                                       | Keep records of near miss, minor, lost time, and fatal health and safety incidents related to the project, compile records from  | Ongoing with Monthly Compilation of Records                                  | For all project components, all construction areas and related facilities, labour camps and                                    | Zero lost time incidents or fatalities (among workers and community)                                                                                                                 | EPC contractor to undertake monitoring and report to NEA in monthly and quarterly                                                                                 | Check monitoring being undertaken, review records and reports,                                                      |

| Project Activity or Environment Impacts/ Risks | Monitoring Parameters        | Method of Monitoring including Standards/ Guidelines                                                                                                              | Frequency and Timing                        | Location/ Components                                                                                                                   | Performance Indicator                                                                                                                                                                                                                                                                                                                                                                                                                    | Implementation                                              | Supervision (NEA PMU)                                                            |
|------------------------------------------------|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|----------------------------------------------------------------------------------|
|                                                |                              | construction sites into a database for tracking. Carry out randomized interviews with workers and the community to identify if any unrecorded incidents occurred. |                                             | overnight accommodation areas etc. Offsite traffic incidents related to contractor's vehicles or the condition of access roads to site | For 100% lost time incidents or fatalities immediate action taken to avoid repeat or escalation of situation<br><br>All incidents including minor and near miss dealt with in accordance with EMP/CSEMP with lessons learnt for future<br><br>100% lost time and fatalities reported to NEA within 24 hours and ADB within 48 hours with incident report submitted within 48 hours with root cause analysis and corrective action taken. | progress reports with records and reports attached.         | conduct interviews with workers and the community and document compliance in EMR |
| Water resources                                | Water volume used and source | Keep records of all water used (volume in m <sup>3</sup> ) and source. Carry out randomized                                                                       | Ongoing with Monthly Compilation of Records | For TL, SS, DC and DRC, all construction areas and related                                                                             | Water use documented. No grievance received during                                                                                                                                                                                                                                                                                                                                                                                       | EPC contractor to undertake monitoring and report to NEA in | Check monitoring being undertaken,                                               |

| Project Activity or Environment Impacts/ Risks | Monitoring Parameters                        | Method of Monitoring including Standards/ Guidelines                                                                                                                                                                                                                                                                                            | Frequency and Timing                        | Location/ Components                                                                                                       | Performance Indicator                                                                                                                                                                                                                 | Implementation                                                                                                                         | Supervision (NEA PMU)                                                                                                                  |
|------------------------------------------------|----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
|                                                |                                              | interviews with the community to identify if any unrecorded grievances occurred.                                                                                                                                                                                                                                                                |                                             | facilities, labour camps and overnight accommodation areas etc.                                                            | construction or operation regarding conflict with other water users                                                                                                                                                                   | monthly and quarterly progress reports with records and evidence provided.                                                             | review records, conduct interviews with the community and document compliance in EMR                                                   |
| Soil (earthworks)                              | Volume of soil disturbed during construction | Keep records of earthworks involved, including total volume in m <sup>3</sup> of soil excavated and reused (any disposed of as spoil off site to licensed waste disposal facilities recorded as per waste generation)<br>Carry out visual inspection and randomized interviews with community to identify if any unrecorded grievances occurred | Ongoing with Monthly Compilation of Records | For TL, SS, DC and DRC, construction sites involving earthworks/cut and fill activities                                    | Earthworks documented, and all excavated and cut and fill volumes accounted for, either reused on-site or disposed of off-site to licensed waste disposal facilities with no grievance received related to spoil disposal unresolved. | EPC contractor to undertake monitoring and report to NEA in monthly and quarterly progress reports with records and evidence provided. | Check monitoring being undertaken, review records, conduct Inspection and interviews with the community and document compliance in EMR |
| Hazardous materials– incidents                 | Pollution incidents                          | Records of pollution incidents (e.g., type of material spilled, amount in kg or m <sup>3</sup> , and action taken to clean up)<br><br>Carry out visual inspection and interviews with                                                                                                                                                           | Ongoing with Monthly Compilation of Records | For TL, SS, DC and DRC, all construction areas and related facilities, labour camps and overnight accommodation areas etc. | Zero major incidents occurred. Minor incidents responded to in accordance with EMP/CSEMP with lessons learnt for future.                                                                                                              | EPC contractor to undertake monitoring and report to NEA in monthly and quarterly progress reports with records and reports attached.  | Check monitoring being undertaken, review records and reports, conduct Inspection and interviews with the workers and                  |



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| Project Activity or Environment Impacts/ Risks                     | Monitoring Parameters                                                          | Method of Monitoring including Standards/ Guidelines                                                                                                                                                                                                                                                                                                                                                              | Frequency and Timing                        | Location/ Components                                                                                                           | Performance Indicator                                                                                                                                                                                                                                      | Implementation                                                                                                                               | Supervision (NEA PMU)                                                                                                                  |
|--------------------------------------------------------------------|--------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
|                                                                    |                                                                                | workers and the community to identify if any unrecorded incidents occurred                                                                                                                                                                                                                                                                                                                                        |                                             |                                                                                                                                |                                                                                                                                                                                                                                                            |                                                                                                                                              | community and document compliance in EMR                                                                                               |
| Natural Resource Use (Construction Materials) and Waste Generation | Volume of construction materials used, and waste generated, and disposal route | Keep records of all types of materials used and wastes produced by type, volume/ weight. Document waste disposal through transfer notes including type, volume/ weight, transport provider, intermediaries if any and final treatment or disposal facility (with its license and capacity) Carry out visual inspection and randomized interviews with community to identify if any unrecorded grievances occurred | Ongoing with Monthly Compilation of Records | For all project components, all construction areas and related facilities, labour camps and overnight accommodation areas etc. | Transfer of 100% of construction wastes documented, and all wastes disposed of in an environmentally safe and sound manner in accordance with the EMP/CSEMP and IFC General EHS Guidelines with no grievance received related to waste disposal unresolved | EPC contractor to undertake monitoring and report to NEA in monthly and quarterly progress reports with records and other evidence provided. | Check monitoring being undertaken, review records, conduct Inspection and interviews with the community and document compliance in EMR |
| Wildlife                                                           | Animal casualties                                                              | Keep written record, supported by photographs, of any animal conflicts or casualties, including a cause of death if known                                                                                                                                                                                                                                                                                         | Ongoing with Monthly Compilation of Records | For TL, SS, DC and construction site, including temporary construction facilities. Offsite                                     | Zero fatal animal casualties occurred For 100% incidents immediate action taken per wildlife                                                                                                                                                               | EPC contractor to undertake monitoring and report to NEA in monthly and quarterly progress reports                                           | Check monitoring being undertaken, review records and reports, conduct                                                                 |

| Project Activity or Environment Impacts/ Risks | Monitoring Parameters                                                                                                                     | Method of Monitoring including Standards/ Guidelines                                                                                                                                                                                                                                                               | Frequency and Timing                        | Location/ Components                                                                                     | Performance Indicator                                                                                                                                                                                       | Implementation                                                                                                                               | Supervision (NEA PMU)                                                                                                             |
|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
|                                                |                                                                                                                                           | Carry out visual inspection and randomized interviews with workers and community to identify if any unrecorded grievances occurred                                                                                                                                                                                 |                                             | traffic incidents related to the contractor's vehicles or the condition of village roads used for access | encounter protocol and GON legislation and to avoid repeat or escalation of situation<br>All incidents including minor and near miss dealt with in accordance with EMP/CSEMP with lessons learnt for future | with records and reports attached.                                                                                                           | inspections and interviews with the community and document compliance in EMR                                                      |
| Employment                                     | Records of all construction workers including subcontractor workers whether formally or informally employed and including any daily labor | Keep records of employment generated, age/gender/sex-disaggregated employment data, home locations, medical checks, if labor accommodation provided, and trainings and inductions received<br>Carry out visual inspection and randomized interviews with workers to identify if any unrecorded grievances occurred | Ongoing with Monthly Compilation of Records | For all project components, construction site                                                            | Employment in accordance with EMP/CSEMP plus GON legislation; no grievance received related to employment of workers unresolved                                                                             | EPC contractor to undertake monitoring and report to NEA in monthly and quarterly progress reports with records and other evidence provided. | Check monitoring being undertaken, review records, conduct inspections and interviews with workers and document compliance in EMR |
| Climate change emissions                       | SF6 used and leakage rates                                                                                                                | Keep records of SF6 total volume used in                                                                                                                                                                                                                                                                           | Ongoing with Monthly                        | Substations                                                                                              | EMP compliance: significantly less                                                                                                                                                                          | EPC contractor to undertake                                                                                                                  | Check monitoring                                                                                                                  |



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| Project Activity or Environment Impacts/ Risks | Monitoring Parameters                  | Method of Monitoring including Standards/ Guidelines                                                                                           | Frequency and Timing                        | Location/ Components                                                                                                                                        | Performance Indicator                                     | Implementation                                                                                                                             | Supervision (NEA PMU)                                                                                                             |
|------------------------------------------------|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
|                                                |                                        | SS installation and leakage rates                                                                                                              | Compilation of Records                      |                                                                                                                                                             | than 0.1% leakage rate                                    | monitoring and report to NEA in monthly and quarterly progress reports with records attached                                               | being undertaken, review records, and document compliance in EMR                                                                  |
| Drinking water supplies                        | GON drinking water standards           | Drinking water tests from supplier<br>Carry out visual inspection and randomized interviews with workers to identify any unrecorded grievances | Ongoing with Monthly Compilation of Records | For all project components, sources of drinking water for construction for which supplier can provide copies of drinking water tests to confirm compliance. | GON drinking water parameters                             | EPC contractor to undertake monitoring and report to NEA in monthly and quarterly progress reports with records and test reports attached. | Check monitoring being undertaken, review records, conduct inspections and interviews with workers and document compliance in EMR |
| <b>O&amp;M</b>                                 |                                        |                                                                                                                                                |                                             |                                                                                                                                                             |                                                           |                                                                                                                                            |                                                                                                                                   |
| Climate change emissions                       | SF6 used and leakage rates             | Keep records of SF6 total volume used and leakage rates                                                                                        | Ongoing with Monthly Compilation of Records | Substations                                                                                                                                                 | EMP compliance: significantly less than 0.1% leakage rate | NEA O&M team to undertake monitoring and report to PMU in monthly and quarterly progress reports with records attached                     | Check monitoring being undertaken, review records, and document compliance in EMR                                                 |
| Health and Safety – incidents                  | Records of health and safety incidents | Keep records of near miss, minor, lost time, and fatal health and safety incidents,                                                            | Ongoing with Monthly Compilation of Records | Substations                                                                                                                                                 | Zero lost time incidents or fatalities (among workers and | NEA O&M team to undertake monitoring and report to PMU in                                                                                  | Check monitoring being undertaken,                                                                                                |

| Project Activity or Environment Impacts/ Risks | Monitoring Parameters        | Method of Monitoring including Standards/ Guidelines                                                                                                                    | Frequency and Timing                | Location/ Components    | Performance Indicator                                                                                                                                                                                                                                                                                                                                                                                                                                | Implementation                                                           | Supervision (NEA PMU)                                                                                        |
|------------------------------------------------|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
|                                                |                              | compile incident records into database for tracking<br>Carry out randomized interviews with workers and the community to identify if any unrecorded incidents occurred. |                                     |                         | community)<br><br>For 100% lost time incidents or fatalities immediate action taken to avoid repeat or escalation of situation<br><br>All incidents including minor and near miss dealt with in accordance with EMP with lessons learnt for future<br><br>100% lost time and fatalities reported within NEA in 24 hours and ADB within 48 hours with incident report submitted within 48 hours with root cause analysis and corrective action taken. | monthly and quarterly progress reports with records and reports attached | review records and reports, conduct interviews with workers and the community and document compliance in EMR |
| Water resources                                | Water volume used and source | Keep records of all water used (volume in m <sup>3</sup> ) and source. Carry                                                                                            | Ongoing with Monthly Compilation of | Substations, DC and DRC | Water use documented. No grievance                                                                                                                                                                                                                                                                                                                                                                                                                   | NEA O&M team to undertake monitoring and                                 | Check monitoring being                                                                                       |

| Project Activity or Environment Impacts/ Risks | Monitoring Parameters                                   | Method of Monitoring including Standards/ Guidelines                                                                                                                                                                                                      | Frequency and Timing                        | Location/ Components | Performance Indicator                                                                                                                                                            | Implementation                                                                                                                      | Supervision (NEA PMU)                                                                                                                                          |
|------------------------------------------------|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                |                                                         | out randomized interviews with community to identify if any unrecorded grievances occurred.                                                                                                                                                               | Records                                     |                      | received during construction or operation regarding conflict with other water users                                                                                              | report to PMU in monthly and quarterly progress reports with records provided.                                                      | undertaken, review records, conduct interviews with the community and document compliance in EMR                                                               |
| Hazardous materials– incidents                 | Pollution incidents                                     | Records of pollution incidents (e.g., type of material spilled, amount in kg or m <sup>3</sup> , and action taken to clean up) Carry out visual inspection and interviews with workers and the community to identify if any unrecorded incidents occurred | Ongoing with Monthly Compilation of Records | Substations          | Zero major incidents occurred. Minor incidents responded to in accordance with EMP with lessons learnt for future.                                                               | NEA O&M team to undertake monitoring and report to PMU in monthly and quarterly progress reports with records and reports attached. | Check monitoring being undertaken, review records and reports, conduct Inspection and interviews with the workers and community and document compliance in EMR |
| Solid and Hazardous Waste Generation           | Solid and hazardous waste generated, and disposal route | Keep records of all types of wastes produced by type, volume/ weight. Document waste disposal through transfer notes including type, volume/ weight, transport provider, intermediaries if any and final treatment or                                     | Ongoing with Monthly Compilation of Records | Substations          | Transfer of 100% of O&M wastes documented, and all wastes disposed of in an environmentally safe and sound manner in accordance with the EMP and IFC General EHS Guidelines with | NEA O&M team to undertake monitoring and report to PMU in monthly and quarterly progress reports with records provided              | Check monitoring being undertaken, review records, conduct Inspection and interviews with the community and document compliance in EMR                         |

| Project Activity or Environment Impacts/ Risks | Monitoring Parameters        | Method of Monitoring including Standards/ Guidelines                                                                                                                        | Frequency and Timing                        | Location/ Components                                                                                                                        | Performance Indicator                                      | Implementation                                                                                                              | Supervision (NEA PMU)                                                                                                             |
|------------------------------------------------|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
|                                                |                              | disposal facility (with its license and capacity)<br>Carry out visual inspection and randomized interviews with community to identify if any unrecorded grievances occurred |                                             |                                                                                                                                             | no grievance received related to waste disposal unresolved |                                                                                                                             |                                                                                                                                   |
| Drinking water supplies                        | GON drinking water standards | Drinking water tests from supplier<br>Carry out visual inspection and randomized interviews with workers to identify any unrecorded grievances                              | Ongoing with Monthly Compilation of Records | SS, DC and DRC sources of drinking water for operation for which supplier can provide copies of drinking water tests to confirm compliance. | GON drinking water parameters                              | NEA O&M team to undertake monitoring and report to PMU in monthly and quarterly progress reports with test reports attached | Check monitoring being undertaken, review records, conduct inspections and interviews with workers and document compliance in EMR |

**Table A6-2: Quantitative and Instrumental Environmental Monitoring Plan (EMoP)**

| Project Activity or Environment Impacts/ Risks | Monitoring Parameters                                                         | Method of Monitoring including Standards/ Guidelines                                                                                                                                                                                                       | Frequency and Timing  | Location                                                                                                                                                                                   | Performance Indicator | Implementation                                                                                                                             | Supervision (NEA PMU)                                            |
|------------------------------------------------|-------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| <b>Pre-construction</b>                        |                                                                               |                                                                                                                                                                                                                                                            |                       |                                                                                                                                                                                            |                       |                                                                                                                                            |                                                                  |
| Property and physical cultural resources       | Pre-construction survey of property condition and physical cultural resources | Detailed photographic survey of property condition and physical cultural resources including structural engineering survey where at risk of cosmetic or structural damage from construction works (e.g., soil compaction, piling works, traffic movements) | Once pre-construction | Private properties, buildings, drains, public utilities, physical cultural resources within TL RoW or within 50m of substation or along village roads that will be used for offsite access | EMP compliance        | Contractor to undertake monitoring and report to PMU before the commencement of construction works with copy of survey reports             | Check monitoring being undertaken and document compliance in EMR |
| Vegetation/trees                               | Pre-clearance survey of trees to be cut                                       | Detailed survey/ inventory of the number, location, size, and species of trees to be cut                                                                                                                                                                   | Once pre-construction | TL, SS, construction site, including temporary construction facilities                                                                                                                     | EMP compliance        | Contractor's ecologist to undertake monitoring and report to PMU before the commencement of construction works with copy of survey reports | Check monitoring being undertaken and document compliance in EMR |

| Project Activity or Environment Impacts/ Risks | Monitoring Parameters                                                                                    | Method of Monitoring including Standards/ Guidelines                                                                                                                                                                                          | Frequency and Timing                                                                      | Location                                                               | Performance Indicator                                                                                                                                                        | Implementation                                                                                                                             | Supervision (NEA PMU)                                            |
|------------------------------------------------|----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| Vegetation/trees                               | Pre clearance survey of habitat types, species present                                                   | Habitat/ vegetation survey with method to be agreed with PISC ecologist but including determination of MH or NH extent, extent x quality of habitat, invasive species, type dominance and extent, with incidental records of species presence | Once pre-construction                                                                     | TL, SS, construction site, including temporary construction facilities | EMP compliance                                                                                                                                                               | Contractor's ecologist to undertake monitoring and report to PMU before the commencement of construction works with copy of survey reports | Check monitoring being undertaken and document compliance in EMR |
| Bird survey                                    | Pre-detailed design surveys of notable bird species presence, nests, communal roosts, carcass dumps etc. | Bird survey with method to be agreed with PISC ecologist but including point counts of bird nests, communal roosts, and carcass dumps and vantage point surveys <sup>7</sup> on sections crossing forest, waterbodies, and in the IBA         | Once during overwintering season and once during breeding season prior to detailed design | TL route alignment and 1km buffer either side of route                 | EMP compliance; baseline population established, no notable bird species nests or communal roosts found within 1 km of RoW and bird diverters installed on at risk locations | Contractor's ecologist to undertake monitoring to inform detailed design prior to approval with copy of survey reports                     | Check monitoring being undertaken and document compliance in EMR |

<sup>7</sup> Following Scottish Natural Heritage method (<https://www.nature.scot/doc/recommended-bird-survey-methods-inform-impact-assessment-onshore-windfarms>) or similar to obtain flight line and height information

| Project Activity or Environment Impacts/ Risks | Monitoring Parameters                                                                                                                                | Method of Monitoring including Standards/ Guidelines                                                                                   | Frequency and Timing                                                                               | Location                                                                                                                                                                 | Performance Indicator                                                                                                                                                                                                  | Implementation                                                                                                                                                          | Supervision (NEA PMU)                                            |
|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| Air Quality                                    | PM10, PM2.5, to be measured as 24hrs average over a fortnight along with meteorological data- temperature, humidity, wind speed, and wind direction. | Measurement professional, calibrated portable monitoring devices by accredited service provider (record 24-hour data over a fortnight) | One time for baseline establishment prior to the start of any activity on site (during dry season) | SS site boundary and nearest receptor to dusty construction works where receptors <500m from site boundary – if no receptors in 500m no receptor monitoring is required. | Project standards as per IEE (national air quality standards complied with, no increase in baseline levels at receptors where WHO PM10 and PM2.5 levels already exceeded)                                              | EPC contractor to undertake monitoring and report to NEA in monthly and quarterly progress reports with monitoring data provided including laboratory QA certification. | Check monitoring being undertaken and document compliance in EMR |
| Noise                                          | LAeq 1hr day and night for representative 48hr period (ideally 24hr weekday + 24hr weekend and avoid holidays, festivities, strong wind, rain etc.)  | Measurement professional, calibrated portable monitoring devices by accredited service provider                                        | One time for baseline establishment prior to the start of any activity on site                     | SS site boundary and nearest receptor to noisy construction works where receptors <500m from site boundary – if no receptors in 500m no receptor monitoring is required. | Project standards as per IEE (most stringent of GON and WHO guidelines on receptor not area basis for ambient noise) at site boundary and sensitive receptors (or less than 3dBA increase if ambient already exceeded) | EPC contractor to undertake monitoring and report to NEA in monthly and quarterly progress reports with monitoring data provided including laboratory QA certification. | Check monitoring being undertaken and document compliance in EMR |

| Project Activity or Environment Impacts/ Risks | Monitoring Parameters                                                                                                                                                                                                                                                                  | Method of Monitoring including Standards/ Guidelines                                                                                    | Frequency and Timing                                                           | Location                                                                                                                                                                                                                                                                                                                                                                                                                             | Performance Indicator                                           | Implementation                                                                                                                                                          | Supervision (NEA PMU)                                            |
|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| Surface and Ground Water Quality               | <p>pH, EC, turbidity, color, TSS, DO, BOD5, COD, oil and grease, total and faecal coliform bacteria, total nitrogen, total phosphorus</p> <p>If used by local community as a source of drinking water to also test against GON drinking water standards (full suite of parameters)</p> | Water sample is to be taken in a clean, non-contaminated, well-sealed container and tested within the next 48h by accredited laboratory | One time for baseline establishment prior to the start of any activity on site | <p>TL surface waterbody and groundwater wells within 50m of tower sites, at least one surface water sample from nearest surface water body and one groundwater sample from nearest groundwater well to be sampled – if no receptors in 50m no receptor monitoring is required.</p> <p>SS surface waterbody and groundwater wells within 500m of sites, at least one surface water sample from nearest surface water body and one</p> | GoN guidelines for surface water/drinking water for groundwater | EPC contractor to undertake monitoring and report to NEA in monthly and quarterly progress reports with monitoring data provided including laboratory QA certification. | Check monitoring being undertaken and document compliance in EMR |

| Project Activity or Environment Impacts/ Risks | Monitoring Parameters                                                                                     | Method of Monitoring including Standards/ Guidelines                                                                                                           | Frequency and Timing                                                                     | Location                                                                                                                                           | Performance Indicator                                  | Implementation                                                                                                                                                          | Supervision (NEA PMU)                                            |
|------------------------------------------------|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
|                                                |                                                                                                           |                                                                                                                                                                |                                                                                          | groundwater sample from nearest groundwater well to be sampled – if no receptors in 500m no receptor monitoring is required.                       |                                                        |                                                                                                                                                                         |                                                                  |
| Soil Quality                                   | pH, TPH, heavy metals, PCBs, PAHs, and any other contaminants indicated by contaminated land professional | Soil samples to be taken from surface and at depth in a clean, non-contaminated, well-sealed container and tested within the next 48h by accredited laboratory | One time for baseline establishment prior to the start of any activity on site           | NEW SS at locations of visible contamination in existing substation                                                                                | International soil quality guidelines e.g., Australian | EPC contractor to undertake monitoring and report to NEA in monthly and quarterly progress reports with monitoring data provided including laboratory QA certification. | Check monitoring being undertaken and document compliance in EMR |
| Drinking water supplies                        | GON drinking water standards                                                                              | Water sample is to be taken in a clean, non-contaminated, well-sealed container and tested within the next 48h by accredited laboratory                        | One time for baseline establishment to ensure source of water suitable as drinking water | TL, SS Sources of drinking water for construction, and sources of drinking water for operation of the SS/DC/DRC for which copies of drinking water | GoN drinking water parameters                          | EPC contractor to undertake monitoring and report to NEA in monthly and quarterly progress reports with monitoring data provided including laboratory QA certification. | Check monitoring being undertaken and document compliance in EMR |

| Project Activity or Environment Impacts/ Risks                                                                 | Monitoring Parameters                                                          | Method of Monitoring including Standards/ Guidelines                                                                                                                                                                                                       | Frequency and Timing               | Location                                                                                                                                                      | Performance Indicator                                                                                                            | Implementation                                                                                                                                                  | Supervision (NEA PMU)                                            |
|----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
|                                                                                                                |                                                                                |                                                                                                                                                                                                                                                            |                                    | tests are not available to confirm compliance e.g., new borewells.                                                                                            |                                                                                                                                  |                                                                                                                                                                 |                                                                  |
| <b>Construction including Site Establishment, Preparation and Clearance Works and Commissioning Activities</b> |                                                                                |                                                                                                                                                                                                                                                            |                                    |                                                                                                                                                               |                                                                                                                                  |                                                                                                                                                                 |                                                                  |
| Property and physical cultural resources                                                                       | Post-construction survey of property condition and physical cultural resources | Detailed photographic survey of property condition and physical cultural resources including structural engineering survey where at risk of cosmetic or structural damage from construction works (e.g., soil compaction, piling works, traffic movements) | Once on completion of construction | Private properties, buildings, drains, public utilities within TL RoW or within 50m of substation or along village roads that will be used for offsite access | EMP compliance (no residual damage compared to baseline survey)                                                                  | Contractor to undertake monitoring and report to PMU before the commencement of construction works with copy of survey reports                                  | Check monitoring being undertaken and document compliance in EMR |
| Vegetation/Trees                                                                                               | Post-construction survey of habitat types, species present                     | Habitat/ vegetation survey per pre-construction baseline including extent of cleared and uncleared area disaggregated to MH or NH, extent x quality of habitat that remains, invasive species, type                                                        | Once on completion of construction | TL, SS, construction site, including temporary construction facilities                                                                                        | EMP compliance; satisfactory site restoration undertaken with>NNL, no significant conversation or degradation of natural habitat | Contractor's ecologist to undertake monitoring and report to PMU before the commencement of construction works with copy of survey reports with monitoring data | Check monitoring being undertaken and document compliance in EMR |

| Project Activity or Environment Impacts/ Risks | Monitoring Parameters                        | Method of Monitoring including Standards/ Guidelines                                                | Frequency and Timing | Location                      | Performance Indicator                                                                                                                                                                                                                                                                        | Implementation                                                                             | Supervision (NEA PMU)                                            |
|------------------------------------------------|----------------------------------------------|-----------------------------------------------------------------------------------------------------|----------------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|------------------------------------------------------------------|
|                                                |                                              | dominance and extent, with incidental records of species presence                                   |                      |                               | compared to baseline situation, no invasive species introduced or now dominating habitat or with increased extent of compared to baseline situation                                                                                                                                          | provided including laboratory QA certification                                             |                                                                  |
|                                                | Record of compensatory plantation undertaken | Record of all trees (species and location) planted by the project component or by DoF on its behalf | Monthly              | Compensatory plantation sites | 100% of trees removed compensated for at least 1:10 ratio replacement with native species in suitable alternative location to comply with national laws and achieve "no net loss" biodiversity on project completion.<br><br>100% survival of compensatory reforestation trees, or continual | PMU to obtain records from contractor employed to undertake compensatory plantation or DoF | Check monitoring being undertaken and document compliance in EMR |

| Project Activity or Environment Impacts/ Risks | Monitoring Parameters                                                                                                                                | Method of Monitoring including Standards/ Guidelines                                                                                   | Frequency and Timing                                                                                                                                        | Location                                                                                                                                                                                                                        | Performance Indicator                                                                                                                                                     | Implementation                                                                                                                                                          | Supervision (NEA PMU)                                            |
|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
|                                                |                                                                                                                                                      |                                                                                                                                        |                                                                                                                                                             |                                                                                                                                                                                                                                 | replacement of those that did not survive                                                                                                                                 |                                                                                                                                                                         |                                                                  |
| Air Quality                                    | PM10, PM2.5, CO, NOx, HC diesel generator emissions per GON requirements                                                                             | Measurement professional, calibrated portable monitoring devices by accredited service provider (record 24-hour data over a fortnight) | Monitor once during commissioning of the operational diesel generator set                                                                                   | Diesel generator stacks where used on TL, SS                                                                                                                                                                                    | Project standards (GON emission standards for DG sets)                                                                                                                    | EPC contractor to undertake monitoring and report to NEA in monthly and quarterly progress reports with monitoring data provided including laboratory QA certification. | Check monitoring being undertaken and document compliance in EMR |
| Air Quality                                    | PM10, PM2.5, to be measured as 24hrs average over a fortnight along with meteorological data- temperature, humidity, wind speed, and wind direction. | Measurement professional, calibrated portable monitoring devices by accredited service provider (record 24-hour data over a fortnight) | Monitor at least once every quarter during active earthworks.<br><br>As requested by PMU in event excessive dust or grievance received during construction. | SS site boundary and nearest receptor to dusty construction works with receptors <500m from site boundary, same locations as baseline – if no receptors in 500m no receptor monitoring is required.<br><br>Undertake additional | Project standards as per IEE (national air quality standards complied with, no increase in baseline levels at receptors where WHO PM10 and PM2.5 levels already exceeded) | EPC contractor to undertake monitoring and report to NEA in monthly and quarterly progress reports with monitoring data provided including laboratory QA certification. | Check monitoring being undertaken and document compliance in EMR |

| Project Activity or Environment Impacts/ Risks | Monitoring Parameters                                                                                                                                           | Method of Monitoring including Standards/ Guidelines                                            | Frequency and Timing                                                                                                                                                                                                | Location                                                                                                                                                                                                                                                                                                   | Performance Indicator                                                                                                                                                                                                                                                                                                             | Implementation                                                                                                                                                          | Supervision (NEA PMU)                                            |
|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
|                                                |                                                                                                                                                                 |                                                                                                 |                                                                                                                                                                                                                     | locations at request NEA in event excessive dust experienced or grievance received                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                         |                                                                  |
| Noise                                          | L <sub>Aeq</sub> 1hr day and night for representative 48hr period (ideally 24hr weekday + 24hr weekend and avoid holidays, festivities, strong wind, rain etc.) | Measurement professional, calibrated portable monitoring devices by accredited service provider | Monitor at least once every month during active construction works.<br><br>One time during commissioning.<br><br>Then as requested by PMU in event excessive noise heard or grievance received during construction. | 1m from noisy equipment within substation in respect of commissioning<br><br>SS site boundary and nearest receptor to noisy construction works with receptors <500m from site boundary, same locations as baseline – if no receptors in 500m no receptor monitoring is required.<br><br>1m from all diesel | Project standards as per IEE (most stringent of GON and WHO guidelines on receptor not area basis for ambient noise) at site boundary and sensitive receptors (or less than 3dBA increase if ambient already exceeded) GoN and IFC General EHS Guidelines for occupational noise exposure not exceeded at 1m from noisy equipment | EPC contractor to undertake monitoring and report to NEA in monthly and quarterly progress reports with monitoring data provided including laboratory QA certification. | Check monitoring being undertaken and document compliance in EMR |

| Project Activity or Environment Impacts/ Risks | Monitoring Parameters                                                                                                                                                                                                                                                           | Method of Monitoring including Standards/ Guidelines                                                                                    | Frequency and Timing                                                                                                                                                                                                                           | Location                                                                                                                                                                                                                                                            | Performance Indicator                                                                               | Implementation                                                                                                                                                          | Supervision (NEA PMU)                                            |
|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
|                                                |                                                                                                                                                                                                                                                                                 |                                                                                                                                         |                                                                                                                                                                                                                                                | generator sets and other noise generating equipment.<br><br>Undertake additional locations at request NEA in event excessive noise heard or grievance received                                                                                                      |                                                                                                     |                                                                                                                                                                         |                                                                  |
| Surface and Ground Water Quality               | pH, EC, turbidity, color, TSS, DO, BOD5, COD, oil and grease, total and faecal coliform bacteria, total nitrogen, total phosphorus<br><br>If used by local community as a source of drinking water to also test against GON drinking water standards (full suite of parameters) | Water sample is to be taken in a clean, non-contaminated, well-sealed container and tested within the next 48h by accredited laboratory | Monitor at least once every quarter during active construction involving earthworks, one time during commissioning (at substations) and then as requested by NEA in event of visible water pollution or grievance received during construction | TL surface waterbody and groundwater wells within 50m of tower sites, same locations as baseline– if no receptors in 50m no receptor monitoring is required.<br><br>SS surface waterbody and groundwater wells within 500m of sites, same locations as baseline– if | GON guidelines for surface water/drinking water for groundwater with on increase in baseline levels | EPC contractor to undertake monitoring and report to NEA in monthly and quarterly progress reports with monitoring data provided including laboratory QA certification. | Check monitoring being undertaken and document compliance in EMR |

| Project Activity or Environment Impacts/ Risks | Monitoring Parameters                                                                                                              | Method of Monitoring including Standards/ Guidelines                                                                                    | Frequency and Timing                                                                                                                                                            | Location                                                                                                                                                          | Performance Indicator                                                                               | Implementation                                                                                                                                               | Supervision (NEA PMU)                                            |
|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
|                                                |                                                                                                                                    |                                                                                                                                         |                                                                                                                                                                                 | no receptors in 500m no receptor monitoring is required.<br><br>Undertake additional locations at request NEA in event water pollution seen or grievance received |                                                                                                     |                                                                                                                                                              |                                                                  |
| Influent and Effluent Water Quality            | pH, EC, turbidity, color, TSS, DO, BOD5, COD, oil and grease, total and faecal coliform bacteria, total nitrogen, total phosphorus | Water sample is to be taken in a clean, non-contaminated, well-sealed container and tested within the next 48h by accredited laboratory | Monitor untreated source and treated water at least once every month and then as requested by PMU in event of visible water pollution or grievance received during construction | SS sedimentation pond, septic tank or package sewage treatment works influent and effluent                                                                        | GON guidelines for surface water/drinking water for groundwater with on increase in baseline levels | EPC contractor to undertake monitoring and report to NEA in monthly and quarterly progress reports with data provided including laboratory QA certification. | Check monitoring being undertaken and document compliance in EMR |
| Drinking water supplies                        | GoN drinking water parameters                                                                                                      | Water sample is to be taken in a clean, non-contaminated, well-sealed container and tested within the next                              | Monitor untreated source and treated water at least once                                                                                                                        | TL, SS Sources of drinking water for construction of project for                                                                                                  | GoN drinking water parameters                                                                       | EPC contractor to undertake monitoring and report to NEA in monthly and quarterly progress                                                                   | Check monitoring being undertaken and document                   |

| Project Activity or Environment Impacts/ Risks | Monitoring Parameters | Method of Monitoring including Standards/ Guidelines | Frequency and Timing                                                                                                   | Location                                                                                                                                                                     | Performance Indicator                               | Implementation                                                                                      | Supervision (NEA PMU)                                            |
|------------------------------------------------|-----------------------|------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
|                                                |                       | 48h by accredited laboratory                         | every month and then as requested by PMU in event of visible water pollution or grievance received during construction | which supplier is unable to provide copies of drinking water tests to confirm compliance.                                                                                    |                                                     | reports with monitoring data provided including laboratory QA certification.                        | compliance in EMR                                                |
| EMF                                            | EMF exposure levels   | EMF meter                                            | One time during commissioning                                                                                          | TL beneath conductor, at edge of safety clearance and at edge of ROW - one location between each AP<br><br>Substation 1m from all EMF generating equipment and site boundary | ICNIRP public exposure limits for EMF complied with | EPC contractor to undertake monitoring and report to NEA in monthly and quarterly progress reports. | Check monitoring being undertaken and document compliance in EMR |

| Project Activity or Environment Impacts/ Risks | Monitoring Parameters                                                                                   | Method of Monitoring including Standards/ Guidelines                                                                                                                                                                                                                                                                             | Frequency and Timing                                                                                                         | Location                                                                                           | Performance Indicator                                                                                                                                                                                                       | Implementation                                                                                      | Supervision (NEA PMU)                                            |
|------------------------------------------------|---------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| Bird survey                                    | Post-commissioning surveys of notable bird species presence, nests, communal roosts, carcass dumps etc. | Bird survey with method to be agreed with PISC ecologist but including point counts of bird nests, communal roosts, and carcass dumps and vantage point surveys on sections crossing forest, waterbodies, and in the IBA                                                                                                         | Once during overwintering season and once during breeding season during the defect liability period                          | TL route alignment and 1km buffer either side of route                                             | EMP compliance; no decrease in baseline population, no notable bird species nests or communal roosts found within 1 km of RoW and bird diverters installed on at risk locations or other adaptive management measures taken | Contractor's ecologist to undertake monitoring with copy of survey reports                          | Check monitoring being undertaken and document compliance in EMR |
| Bird collision and electrocution               | Carcass survey and condition of bird diverters installed                                                | Visual inspection of transmission line and record number of missing bird diverters that need to be replaced and other maintenance activities<br><br>Reports of collisions or electrocutions by NEA O&M staff and from interviews with local community to identify if any unrecorded incidents; power outage reports due to same. | Monthly surveys during twelve-month defect liability period<br><br>Ongoing to maintain records of bird carcasses encountered | Transmission lines; focus on areas through forest land, in proximity to waterbodies and in the IBA | No notable bird species carcass recorded with retrospective marking of TL in locations where issues identified 100% of bird diverters in place and in good condition, or immediately replaced when lost or damaged          | EPC contractor to undertake monitoring and report to NEA in monthly and quarterly progress reports. | Check monitoring being undertaken and document compliance in EMR |

| Project Activity or Environment Impacts/ Risks | Monitoring Parameters                                    | Method of Monitoring including Standards/ Guidelines                                                                                                                                                                                                                                                                                                                                                                       | Frequency and Timing                                                                      | Location                                                                                           | Performance Indicator                                                                                                                                                                                        | Implementation                                                                                    | Supervision (NEA PMU)                                            |
|------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
|                                                |                                                          | Carcass monitoring survey to TOR to be agreed with ADB, as per IFC good international industry practice <sup>8</sup>                                                                                                                                                                                                                                                                                                       |                                                                                           |                                                                                                    |                                                                                                                                                                                                              |                                                                                                   |                                                                  |
| <b>O&amp;M</b>                                 |                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                           |                                                                                                    |                                                                                                                                                                                                              |                                                                                                   |                                                                  |
| Bird collision and electrocution               | Carcass survey and condition of bird diverters installed | <p>Visual inspection of transmission line and record number of missing bird diverters that need to be replaced and other maintenance activities</p> <p>Reports of collisions or electrocutions by NEA O&amp;M staff and from interviews with local community to identify if any unrecorded incidents; power outage reports due to same.</p> <p>Carcass monitoring survey to TOR to be agreed with ADB, as per IFC good</p> | <p>Quarterly surveys</p> <p>Ongoing to maintain records of bird carcasses encountered</p> | Transmission lines; focus on areas through forest land, in proximity to waterbodies and in the IBA | No notable bird species carcass recorded with adaptive management measures taken where issues identified 100% of bird diverters in place and in good condition, or immediately replaced when lost or damaged | NEA O&M team to undertake monitoring and report to PMU in monthly and quarterly progress reports. | Check monitoring being undertaken and document compliance in EMR |

<sup>8</sup> <https://www.ifc.org/en/insights-reports/2023/bird-bat-fatality-monitoring-onshore-wind-energy-facilities>

| Project Activity or Environment Impacts/ Risks | Monitoring Parameters                                                                                                              | Method of Monitoring including Standards/ Guidelines                                                                                    | Frequency and Timing                                                                                                                                                                                          | Location                                                               | Performance Indicator                                                                               | Implementation                                                                                                                                                        | Supervision (NEA PMU)                                            |
|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
|                                                |                                                                                                                                    | international industry practice                                                                                                         |                                                                                                                                                                                                               |                                                                        |                                                                                                     |                                                                                                                                                                       |                                                                  |
| Air Quality                                    | PM10, PM2.5, CO, NOx, HC diesel generator emissions per GON requirements                                                           | Measurement professional, calibrated portable monitoring devices by accredited service provider (record 24-hour data over a fortnight)  | Monitor full-time during semi-annual testing of the operational diesel generator set<br><br>As requested by PMU in event excessive emissions seen or grievance received during operation of diesel generator. | Diesel generator stack as SS                                           | Project standards (GON emission standards for DG sets)                                              | NEA O&M team to undertake monitoring and report to PMU in monthly and quarterly progress reports with monitoring data provided including laboratory QA certification. | Check monitoring being undertaken and document compliance in EMR |
| Influent and Effluent Water Quality            | pH, EC, turbidity, color, TSS, DO, BOD5, COD, oil and grease, total and faecal coliform bacteria, total nitrogen, total phosphorus | Water sample is to be taken in a clean, non-contaminated, well-sealed container and tested within the next 48h by accredited laboratory | Monitor untreated source and treated water at least semi-annually and then as requested by PMU in event of visible water pollution or grievance                                                               | SS septic tank or package sewage treatment works influent and effluent | GON guidelines for surface water/drinking water for groundwater with on increase in baseline levels | NEA O&M team to undertake monitoring and report to PMU in monthly and quarterly progress reports with monitoring data provided including laboratory QA certification. | Check monitoring being undertaken and document compliance in EMR |

| Project Activity or Environment Impacts/ Risks | Monitoring Parameters         | Method of Monitoring including Standards/ Guidelines                                                                                    | Frequency and Timing                                                                                                                                                | Location                                                                                                                                            | Performance Indicator         | Implementation                                                                                                                                                     | Supervision (NEA PMU)                                            |
|------------------------------------------------|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
|                                                |                               |                                                                                                                                         | received during O&M                                                                                                                                                 |                                                                                                                                                     |                               |                                                                                                                                                                    |                                                                  |
| Drinking water supplies                        | GoN drinking water parameters | Water sample is to be taken in a clean, non-contaminated, well-sealed container and tested within the next 48h by accredited laboratory | Monitor untreated source and treated water at least semi-annually and then as requested by PMU in event of visible water pollution or grievance received during O&M | SS sources of drinking water for operation of project for which supplier is unable to provide copies of drinking water tests to confirm compliance. | GoN drinking water parameters | NEA O&M team to undertake monitoring and report to PMU monthly and quarterly progress reports with monitoring data provided including laboratory QA certification. | Check monitoring being undertaken and document compliance in EMR |



*[Handwritten signature]*

## Appendix 10: Summary of Transmission Line Inventory of Receptors

Note: Due to range and size of inventory checklists (about 400+ pages) summary is provided below instead.

The inventory checklists are available electronically and may be requested from NEA-PMD. Inventories need to be revisited as part of updating the IEE.

| Component                                                           | Category/Type of Receptors Identified | No. Tower Stretches Supporting Receptor or Land Use Type |                  | Remarks                                                                                                                                                                                              |
|---------------------------------------------------------------------|---------------------------------------|----------------------------------------------------------|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DKJTL<br>Dailekh –<br>Kalikot<br>Portion<br><br>180 towers surveyed |                                       | Receptor Not Present                                     | Receptor Present |                                                                                                                                                                                                      |
|                                                                     | Rivers                                | 158                                                      | 22               | Jaraj River, Lohare Khola, Kanda Khola, Kanda Khola, Tame Khola, Bini Khola, Tami Khola, Ghate Khola, Ghate Khola, Gopi Khola, Jilli Khola, Ruru Banchu Khola, Kamkhet Khola, Dilka Khola, Tila Nadi |
|                                                                     | Streams                               | 179                                                      | 1                |                                                                                                                                                                                                      |
|                                                                     | Ponds                                 | 179                                                      | TBC              |                                                                                                                                                                                                      |
|                                                                     | Wetland                               | 180                                                      | 0                |                                                                                                                                                                                                      |
|                                                                     | Irrigation Channels                   | 170                                                      | 10               |                                                                                                                                                                                                      |
|                                                                     | Drainage Channels                     | 117                                                      | 63               |                                                                                                                                                                                                      |
|                                                                     | HV Line Crossing                      | 180                                                      | 0                |                                                                                                                                                                                                      |
|                                                                     | DL Crossings                          | 167                                                      | 13               |                                                                                                                                                                                                      |
|                                                                     | Road Crossings                        | 77                                                       | 103              |                                                                                                                                                                                                      |
|                                                                     | Rail Crossings                        | 180                                                      | 0                |                                                                                                                                                                                                      |
|                                                                     | Health Facilities                     | 168                                                      | 12               |                                                                                                                                                                                                      |
|                                                                     | Educational Facilities                | 167                                                      | 13               |                                                                                                                                                                                                      |
|                                                                     | PCR Graveyard                         | 180                                                      | 0                |                                                                                                                                                                                                      |
|                                                                     | PCR Temple                            | 174                                                      | 6                | AP-22, AP-49, AP-51, AP-66-1, AP-118, AP-0                                                                                                                                                           |



*[Signature]*

| Component                                                             | Category/Type of Receptors Identified | No. Tower Stretches Supporting Receptor or Land Use Type |                         | Remarks                                                                                                                                                                    |
|-----------------------------------------------------------------------|---------------------------------------|----------------------------------------------------------|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                       | Other PCR                             | 180                                                      | 0                       |                                                                                                                                                                            |
|                                                                       | Flood Risk                            | 180                                                      | 0                       |                                                                                                                                                                            |
|                                                                       | Landslide Risk                        | 180                                                      | 0                       |                                                                                                                                                                            |
|                                                                       | Forest Fire Risk                      | 180                                                      | 0                       |                                                                                                                                                                            |
|                                                                       | <b>Land Use Type</b>                  |                                                          |                         |                                                                                                                                                                            |
|                                                                       | Agriculture                           | -                                                        | 54                      |                                                                                                                                                                            |
|                                                                       | Forest                                | -                                                        | 80                      |                                                                                                                                                                            |
|                                                                       | Pasture land                          | -                                                        | 45                      |                                                                                                                                                                            |
|                                                                       | Community Forest                      | -                                                        | TBC                     |                                                                                                                                                                            |
| <b>DKJTL Kalikot - Jumla Portion</b><br><br><b>98 towers surveyed</b> |                                       | <b>Receptor Not Present</b>                              | <b>Receptor Present</b> |                                                                                                                                                                            |
|                                                                       | Rivers                                | 87                                                       | 11                      | AP-18, AP-20, AP-38/1, AP-39, AP-46-1, AP-68, AP-69, AP-71/2, AP-73, AP-74, AP-78 (Pathar Khola, Hima Nadi, Khade Khola, Khajarmi Khola, Hiya Khola, Maha Khola, Um Khola) |
|                                                                       | Streams                               | 65                                                       | 33                      |                                                                                                                                                                            |
|                                                                       | Ponds                                 | 64                                                       | TBC                     |                                                                                                                                                                            |
|                                                                       | Wetland                               | 98                                                       | 0                       |                                                                                                                                                                            |
|                                                                       | Irrigation Channels                   | 92                                                       | 6                       |                                                                                                                                                                            |
|                                                                       | Drainage Channels                     | 97                                                       | 1                       |                                                                                                                                                                            |
|                                                                       | HV Line Crossing                      | 98                                                       | 0                       |                                                                                                                                                                            |
|                                                                       | DL Crossings                          | 86                                                       | 12                      |                                                                                                                                                                            |
|                                                                       | Road Crossings                        | 20                                                       | 78                      |                                                                                                                                                                            |
|                                                                       | Rail Crossings                        | 98                                                       | 0                       |                                                                                                                                                                            |
|                                                                       | Health Facilities                     | 88                                                       | 10                      |                                                                                                                                                                            |
|                                                                       | Educational Facilities                | 88                                                       | 10                      | AP-07, AP-18, AP-25, AP-30, AP-35, AP-38/1, AP-43, AP-51, AP-68, AP-78                                                                                                     |
|                                                                       | PCR Graveyard                         | 98                                                       | 0                       |                                                                                                                                                                            |
|                                                                       | PCR Temple                            | 97                                                       | 1                       | AP78                                                                                                                                                                       |



*[Signature]*

| Component | Category/Type of Receptors Identified | No. Tower Stretches Supporting Receptor or Land Use Type |     | Remarks                                                   |
|-----------|---------------------------------------|----------------------------------------------------------|-----|-----------------------------------------------------------|
|           |                                       |                                                          |     | Also not mentioned in inventory close to AP78 is a temple |
|           | Other PCR                             | 98                                                       | 0   |                                                           |
|           | Flood Risk                            | 98                                                       | 0   |                                                           |
|           | Landslide Risk                        | 98                                                       | 0   |                                                           |
|           | Forest Fire Risk                      | 98                                                       | 0   |                                                           |
|           | <b>Land Use Types</b>                 |                                                          |     |                                                           |
|           | Agriculture                           | -                                                        | 39  |                                                           |
|           | Forest                                | -                                                        | TBC |                                                           |
|           | Pasture land                          | -                                                        | 59  |                                                           |
|           | Community Forest                      | -                                                        | TBC |                                                           |



*[Handwritten signature]*

## Appendix 11: Consultation Record and Grievance Redress Registration Form

### CONSULTATION RECORD

Meaningful environmental consultations must be conducted in updating the IEE for each TL, SS component as these will be undertaken in the public domain or if on NEA land with receptors potentially impacted by the works. Further meaningful consultation for the IEE update prior to the issue of bidding documents is to be carried out by the PMU/PMD safeguards team with the support of PMU/PMD engineering team. Meaningful consultation is then to be undertaken by the contractor on site layouts and route alignments before the detailed design is approved by NEA. The consultation material will use photographs to help explain the scope of work and convey the findings of the IEE to disseminate information on the potential impacts and their management, as well as informing of the works. An orientation program is proposed for NEA and their contractors on how to conduct meaningful public consultations.

NEA and the contractor are also responsible for completing all other consultations for all subproject implementation in accordance with the EMP – guidance is also given here on who to undertake ongoing meaningful consultations with for associated transmission line under construction.

For environment the following government or civil society representatives should be met for each TL, SS component in updating the IEE prior to bidding documents. Identification of key stakeholders during detailed design will be done by the contractors in due consultation with officers of PMU/PMD safeguards team, in line with this guidance and the stakeholder engagement (community liaison) plan prepared by NEA during pre-construction.

- District Forest Officers
- Protected Area Buffer Zone Management (as applicable)
- Department of Archaeology
- Ward Presidents and committee members from villages and municipal areas within 500m of each TL, SS component
- Temple head or similar for any physical cultural resources within 500m of each TL, SS component
- School/Technical Institutes/student hostels, head for all education facilities within 500m
- Bird Conservation Nepal and other ecological NGO on critical habitat qualifying and GoN Protected species etc.

**Table 1: Summary Record of Subproject Environment Meetings and Discussions with Government and Civil Society Representatives\***

| Date | Location | Name of the Person | Position or Title, Agency | Topics Discussed | Suggestions for Alignment and Mitigation | Contact Number | Signature |
|------|----------|--------------------|---------------------------|------------------|------------------------------------------|----------------|-----------|
|      |          |                    |                           |                  |                                          |                |           |
|      |          |                    |                           |                  |                                          |                |           |

\* Provide photograph of the meeting in progress

The contractors concerned with guidance from NEA will identify appropriate methods for public consultation at each location and suitable dissemination platforms for broader reach. The contractors with guidance from NEA will develop appropriate communication materials in local language (Nepali/Others) for the purposes of consultation especially where affected people include tribes/indigenous peoples. For disclosure purposes, the communication materials will include the positive and negative impacts, mitigation measures, grievance redress mechanism, construction schedule etc. Consultation process will be utilized to address the concerns and project implementation issues raised by the affected people during the consultation.

The contractors will give advance notice about the consultations or other engagement and will disseminate properly for wider participation of beneficiaries or affected people especially women and the scheduled tribes/indigenous peoples.

Public meetings are to be attended by at least 10% of the affected population and have at least 30% representation of women excluding NEA and contractor representatives. If it is not possible at the public consultation to achieve these levels of female participation a separate gender focus group must be held to ensure the concerns of women and vulnerable groups are heard.

**Table 2: Summary Record of Public Consultations and Focus Groups\*<sup>9</sup>**

|                                                                                                                                                                                                  |       |         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------|
| <b>Project Component</b>                                                                                                                                                                         |       |         |
| <b>District/Ward/Municipality</b>                                                                                                                                                                |       |         |
| <b>Village(s)</b>                                                                                                                                                                                |       |         |
| <b>Date and Time</b>                                                                                                                                                                             |       |         |
| <b>Total Population of Affected Persons within 50m of ROW (estimate)</b>                                                                                                                         |       |         |
| <b>Total Number of Participants</b>                                                                                                                                                              | Male: | Female: |
| <b>Number of Participants from Vulnerable Groups</b>                                                                                                                                             |       |         |
| <b>Names and Designations of Key Participants</b>                                                                                                                                                |       |         |
| NEA                                                                                                                                                                                              |       |         |
| Contractor                                                                                                                                                                                       |       |         |
| District administration/village representatives                                                                                                                                                  |       |         |
| <b>Topics Discussed and Findings</b>                                                                                                                                                             |       |         |
| Presence of internationally (KBA/IBA/Ramsar) and nationally important (NP/Buffer Zone) biodiversity sites and tentative UNESCO sites/nationally protected monuments/religious forest in the area |       |         |
| Presence of critical habitat species in the area                                                                                                                                                 |       |         |
| Presence of GoN protected species in the area                                                                                                                                                    |       |         |

<sup>9</sup> Those undertaking the consultations can use checklists similar to those used during the IEE preparation to obtain sufficient information to be able to complete summary record. Photographs and attendance sheet to be attached with the consultation proforma.

|                                                                                                                                |  |
|--------------------------------------------------------------------------------------------------------------------------------|--|
| Presence of any threatened species in the area                                                                                 |  |
| Presence of community forest (or similar) in the area                                                                          |  |
| Presence of trees along alignment and if require cutting                                                                       |  |
| Presence of local physical cultural resources along alignment                                                                  |  |
| Presence of buildings along alignment and if conductor clearances are met                                                      |  |
| Presence of school compounds, playgrounds, or other community facilities along alignment and if conductor clearances are met   |  |
| Existing community H&S incidents and/or concerns with existing distribution lines                                              |  |
| Existing community H&S incidents or pollution (oil leak) and/or concerns with existing transformers                            |  |
| Concerns of community related to H&S of new distribution lines (especially new lines in non-electrified villages)              |  |
| Concerns of community related to pollution and waste management during the works                                               |  |
| Concerns of community related to noise, vibration, dust, air pollution during the construction                                 |  |
| Concerns of community related to disturbance to agricultural activities during works                                           |  |
| Concerns of community related to disturbance to ongoing access and traffic management issues during works                      |  |
| Concerns of community related to incoming skilled workers and their accommodation during the works                             |  |
| Concerns of community related to local employment (jobs created for unskilled workers by construction are very minimal if any) |  |
| GRM and types of grievances related to environment, health and safety that could be raised                                     |  |
| Etc.                                                                                                                           |  |
| <b>Suggestions for Alignment and Mitigation</b>                                                                                |  |

\* Provide photographs of the public meeting and/or focus groups on progress and copy of sign in sheet

**Submitted by:**

Name and signature:

Position:

Date:

**Reviewed by:**

Name and signature:

Position:

Date:

**Note from the Reviewer, if any:**



*[Handwritten signature]*

## Appendix 12: Grievance Redressal Mechanism and Forms

### Background

1. A grievance redress mechanism (GRM) will assist the affected persons in resolving queries and complaints. Due to its critical role in smooth project implementation, the GRM shall be constituted upon loan effectiveness and prior to the commencement of design and construction of project components if earlier.
2. A grievance is an issue, concern, problem, or claim (perceived or actual) that an individual or community group wants to see resolved by the project. A Grievance Redress Mechanism (GRM) is a locally based, project-specific extra-legal way to deal with and resolve project-related grievances/complaints faster than legal mechanisms and thus enhance project performance standards in terms of environmental and social safeguards. NEA will take relevant concerns of affected persons and other stakeholders seriously and ensure that they are actively able to raise and discuss their concerns throughout the project cycle by setting up GRMs.
3. Inconveniences and dissatisfactions, if not managed appropriately at the beginning may snowball into a bigger issue. In order to manage these risks, an internal mechanism to the project is required to be in place where the aggrieved parties can lodge their complaints and get it amicably settled prior to approaching the formal mode of solution (i.e., access to legal system through courts) available to them. Hence, one of the important objectives of the GRM is to provide a formal forum to the aggrieved parties to deal with issues arising out of project component implementation. The GRM will help to establish accountability towards the stakeholders' concerns. The objective of the GRM shall be to provide an accessible mechanism to the affected people, community or any stakeholder(s) having a stake in the project components to raise their issues and grievances in regard to project functioning.
4. There will be a single grievance redress mechanism for both environmental and social related issues. The GRM will resolve any social (including design or route alignment issues, compensation, inconveniences during construction, labor, contractor, community relation issues amongst others) and environmental related grievances, locally in consultation with the aggrieved party to facilitate smooth implementation of project related work activities.
5. The GRM will aim to provide affected persons and other stakeholders with a clear and simple way of filing a suggestion or complaint on the environmental, health and safety performance of the project. The GRM will also cover social safeguards. According to ADB's SPS 2009, a GRM must address complaints promptly, using an understandable and transparent process that is gender responsive, culturally appropriate, and readily accessible to the affected persons at no costs and without retribution. Given these requirements, handling of grievances on the implementation of the project components will be as discussed in this chapter.

### D. GRM Establishment

6. NEA will establish project component-specific Grievance Redress Mechanisms (GRM) to receive and manage any grievances (complaints) that may arise from the project works and facilitate prompt resolution of affected persons' issues, concerns, problems, or claims. Affected persons may include members of the local community or construction workers. The GRMs will address environmental and social safeguard and other related eligible grievances/complaints raised by affected persons, in a timely and culturally appropriate manner.

7. The GRMs will ensure that:
- (i) physically or economically displaced people receive appropriate compensation in accordance with the RIPP;
  - (ii) the basic rights and interests of every person affected by the environmental and social performance of NEA and their contractors on the project are protected; and
  - (iii) issues, concerns, problems, or claims arising from any poor environmental (or social) performance of NEA and their contractors during the conduct of pre-construction, construction, operation and maintenance activities are promptly and effectively addressed.
8. The GRMs will be set up by NEA for each project component and the overall project, upon loan effectiveness and be fully operationalized prior to the commencement of any civil works, including enabling works. NEA and the contractor will appoint GRM focals. The NEA focals may be a different person during the construction and operation. All staff of NEA PMD, the project component PMU site engineers/staff, PSC and the EPC Contractors, as well as local and associated government and other entities directly involved in the GRM process will receive a training prior to the start of works to fully grasp their roles and responsibilities within the GRM as well as approaches to constructively resolve project-related grievances/complaints. Upon completion of works similar training will be provided to NEA O&M staff.
9. **NEA existing GRM system.** NEA has an existing GRM system, catering mostly to power disruption issues. NEA Electricity Helplines: Consumers can call local Distribution Centre to lodge complaints about electricity services or streetlights, provided in the Consumer Information of DCs page of the portal. If not resolved, to contact Regional Office by calling on the provided helpline numbers:

| Regional Office | Phone Number |
|-----------------|--------------|
| Biratnagar      | 021436057    |
| Janakpur        | 041521078    |
| Hetauda         | 057524468    |
| Kathmandu       | 014153156    |
| Butwal          | 071438584    |
| Pokhara         | 061466401    |
| Nepalgunj       | 081524271    |

10. Consumers can also send an email to [info@nea.org.np](mailto:info@nea.org.np) with issue related to power supply. Steps to file an online complaint:
- Visit the official [NEA website \(nea.org.np\)](http://nea.org.np) 2.
  - Navigate to the 'Consumer Service' section.
  - Click "[Post your complaint](#)" to open the online complaint form.
  - Fill out the form with required details including customer ID, type of electricity issue, and fault location (if known).
  - Submit the form.
  - Finally, note down the reference/ticket ID to track status. If not resolved, visit nearest divisional office to submit a written complaint letter with the reference ID.
11. Escalation to Head Office: If the issue is not resolved, it may be escalated to the appointed Head of Customer Service at Nepal Electricity Authority by contacting the Central Office in Kathmandu or using the email provided:  
Phone Numbers: +97714153051, +97714153009 (fax)

Email: [info@nea.org.np](mailto:info@nea.org.np)

Address: Central Office, Nepal Electricity Authority, Durbarmarg, Kathmandu, Nepal.

12. The above system is mostly for electrical complaints but can be tied into the project GRM operationalization.
13. All staff and workers of NEA/PMD/PMU/PSC and EPC Contractors and subcontractors (if any) will be made aware of the existence of the GRM and must know who to direct any complainant to if approached regarding a grievance. Local government representatives/Ward/Municipal committee/ward members will also be briefed by NEA on the GRM and so be able to take up complaints and pass them onto NEA or the contractor to be addressed. NEA management will have overall responsibility for timely grievance redressal on safeguard issues with the support of their GRM focal for ensuring disclosure, registration of grievances, and communication with the grievant.
14. A grievance log must be always kept on-site by the contractor's focal and collated at PMD level by each project component's GRM focal – environment safeguards officer of the PMU for collation in the project EMRs. Any grievance/complaint received, whether minor or major, whoever it was first addressed to, must be reported and documented when it is received, including: name of the person making the complaint; date and time the complaint was received; location and relation of the complaint to the project; nature of the complaint; dates of subsequent communications; details of all meetings held, including participants, date, issues discussed and decisions taken; details of all actions taken towards resolution of the grievance; log of all formal communication sent to the complainant informing of the evolution of the process etc.
15. All entries to the grievance register, no matter how minor or whether resolved at an initial informal level on site or at any of the formal levels of the GRM, along with updates on ongoing or completed actions taken to address the grievance will be included in monthly reports by the contractor to NEA and detailed in the quarterly project reports and environmental monitoring reports to be submitted by NEA to ADB. NEA will also notify ADB immediately of any grievances that enter the third stage (GRC) of the GRMs or are related to immediate risk to human life, or impending damage to structures, flora or fauna, or physical cultural resources.

#### **E. GRM Objectives**

16. NEA will institute transparent and timebound GRMs to receive and resolve the affected persons' grievances and complaints. GRM is an accessible and trusted platform for all the affected persons to seek solutions and relief for their project-related problems and grievances, without resorting to lengthy and costly judicial process. The GRM will not deal with matters pending in a court of law. Its success and legitimacy will depend on the affected persons' capacity for consultations and desire to resolve grievances through discussion and negotiation. Culturally appropriate, gender responsive, and accessible mechanisms will be formulated but shall not impede access to the country's judicial or administrative remedies. Access to the national judicial system is not contingent to the resolution through the GRM. The presence of GRM or seeking relief from GRM is not a bar to take grievances and complaints to the local administration or courts for arbitration. Local administrators or the courts can be approached at any time in the GRM process and independently of it.

17. Affected peoples may (subject to eligibility criteria) also access ADB's Accountability Mechanism<sup>10</sup> whereby people adversely affected by ADB financed projects can express their grievances; seek solutions; and report alleged violations of ADB's operational policies and procedures, including safeguard policies. This can be approached as a last resort by the grievant once the complaint has been raised through the GRM and ADB Nepal Resident Mission.
18. ADB Safeguard Policy Statement (2009) requires the establishment of a responsive, readily accessible, and culturally appropriate grievances redress mechanism capable of receiving and facilitating the resolution of affected persons' concerns and grievances about the physical, social and economic impacts of the projects. The GRM aims to: (i) reduce conflict, risk of undue delay and complication in project implementation; (ii) improve quality of project activities and outputs; (iii) ensure that the rights of affected parties are respected; (iv) identify and respond to unintended impacts of projects on individuals; and (v) maximize participation, support, and benefit to local communities. The fundamental objectives of the Grievance Redress Mechanism are:
- (i) To provide an accessible mechanism to the affected people, community or any stakeholder(s) having a stake in the project to raise their issues and grievances in regard to project functioning;
  - (ii) To reach mutually agreed solutions satisfactory to both, the project and the affected persons, and to resolve any project-related grievance locally, in consultation with the aggrieved party;
  - (iii) To facilitate the smooth implementation of the Environmental Management Plan and prevent delay in project implementation;
  - (iv) To democratize the development process at the local level, while maintaining transparency as well as to establish accountability to the affected people;
  - (v) To facilitate an effective dialogue and open communication between the project stakeholders; and
  - (vi) To have clear definition of roles and responsibilities.
19. In grievance redress, it is important for grievance handlers to be clear on the issues involved and why the grievant is dissatisfied. The first step is an honest appraisal of whether the grievance received is proactive or reactive to a situation, how it is relevant to the proposed project, and if it falls under the national and ADB policy and legal framework as described in Chapter II. This will enable ineligible grievances to be identified. For those that are eligible the facts must then be established in full through soliciting information and observations in the field, in communication with the grievant and others to clearly define the problem to be resolved. The grievance handlers need to be able to clearly appraise the grievant of their grievance's relevance to the project, and the applicable national and ADB policy and legal framework, so that both sides have common understanding of the context.
20. Once the problem is clear, options for resolution can then be analysed, and a time bound grievance resolution action plan agreed with the grievant for implementation by NEA or their contractor. Once a resolution has been proposed to the complainant, the grievant will be asked to sign a form acknowledging receipt of that proposal and providing their approval or refusal, as applicable; this form will be added to the grievance/complaint register and once all actions are taken the associated entry will be closed but not deleted. Implementation of the actions must then be monitored by the NEA GRM focal with regular follow-ups.

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<sup>10</sup> There are two parts to ADB's Accountability Mechanism, (i) problem solving led by ADB's special project facilitator can assist the complainant in finding solutions to their problems, (ii) providing a process through which those affected by projects can file requests for compliance review by ADB's Compliance Review Panel.

21. Whilst resolution may be quickly reached, the grievance can only be fully closed out once all actions have been completed and the grievant has confirmed their satisfaction. Implementation of the actions must therefore be undertaken by NEA as promptly as is possible and ideally within 15 working days of being agreed, though this will depend on the nature of grievances involved. PSC will also monitor the operationalization of the GRM and the effectiveness of the grievance resolution process along with NEA PMD and both will recommend improvements to increase the efficiency, timeliness and fairness of the process.

## **F. GRM Structure**

22. Each of NEA's PMU established under PMD will set up and publicize their project component level GRM to receive and manage any grievances that may arise from the project components and facilitate prompt resolution of affected person's issues, concerns, problems, or claims using an understandable and transparent process that is gender responsive, culturally appropriate, and readily accessible to the affected persons at no costs and without retribution. The GRMs will be set up upon loan effectiveness and be operationalized at site level prior to the commencement of any civil works, including enabling works.
23. PMUs and the EPC Contractors will nominate their GRM focals. There will be PMU project level and site level focals and a Contractor site level focal cum community engagement officer. All staff of NEA, PMD and the EPC Contractors, as well as local and central government and other entities directly involved in the GRM process will receive training prior to the start.
24. The GRM focals will actively engage with the affected local communities and construction workers throughout pre-construction, construction and at the onset of operation, providing an opportunity for community members or workers to approach them with any grievance/complaint. Any concerned person or group of people can file a complaint through the project's GRM, at any time and at no cost. In addition to verbal grievances, affected peoples may also lodge grievances/complaints online through NEA's website, by phone at numbers provided, by submitting a note in a suggestion box kept on site, by sending a letter, or in person at a project-site office or at the closest NEA office etc. Whatever the source and the form in which the grievance/complaint is received and its nature, and however minor, it should be accepted by the focal and registered in the grievance register and reported to NEA GRM focal.<sup>11</sup> A template for recording grievances is provided in the appendices.
25. Affected peoples can approach the court of law at any time and independently of the project's grievance redress process. Affected peoples may (subject to eligibility criteria) also access ADB's Accountability Mechanism whereby people adversely affected by ADB-financed projects can express their grievances, seek solution, and report alleged violations of ADB's operational policies and procedures, including environmental and social safeguard policies.
26. The GRM will follow a three-tier structure namely:
27. **1<sup>st</sup> Level Grievance (Informal and Formal Site Levels):** During the first level grievance, the EPC Contractor's site level focal will be in charge of the informal stage with the field-based staff of NEA as site level focal for the formal stage if grievances cannot be resolved by the contractor. If workers wish to file a complaint and are not comfortable logging it

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<sup>11</sup> If the complaint is not eligible, the complainant should be informed of the reasons in writing and directed onto other appropriate mechanisms if applicable.

with the informal first level GRM, they can file it directly to NEA and the formal first level of GRM. All grievances/complaints will be sorted by the applicable focal for their eligibility, level of urgency and by nature of the grievance. The EPC Contractor's site level focal will report all grievances received to the field-based staff of NEA for recording purposes. The NEA O&M team will take over this first level of the GRM once operational.

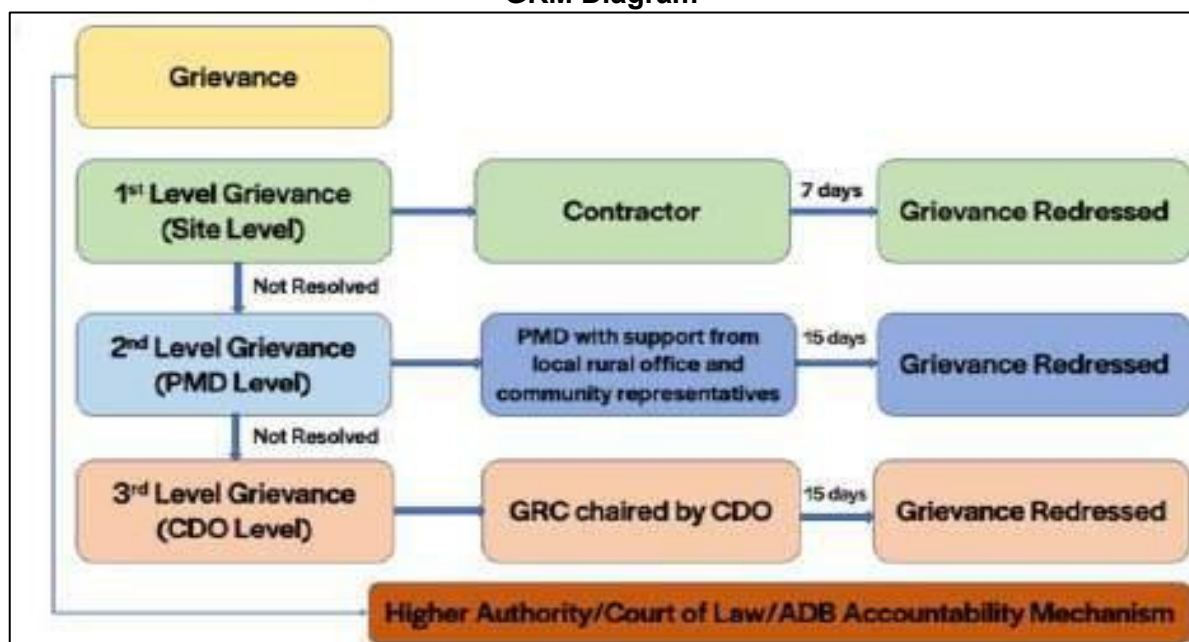
28. The contractors will define a site-level grievance handling protocol, as initial informal input to the GRM. For any urgent matter, in particular emergency and health and safety issues, the contractor's site-level focal will take note of the grievance/complaint and get immediately in contact with their site supervisor for immediate action. Short-term issues (e.g. dust, noise, leaks, inappropriate behaviour, conflict, health and safety etc.) may be corrected by the construction workers immediately under the direction of the EPC contractor's GRM focal and site supervisor. A log of all active complaints, even if resolved at this informal level of GRM, must be communicated to NEA focal fortnightly by the contractor's on-site focal.
29. If not resolved within 3 days of receipt by the contractor or if it cannot be readily resolved by the contractor, then the NEA field staff will provide the most easily accessible first formal level of contact to address it. At this first level grievances to be resolved within 7 days of initial receipt. In case of immediate risk to human life, or impending damage to structures, flora or fauna, or physical cultural resources, the NEA field staff shall get in immediate contact with the PMU Environment Officer or H&S Officer or resident EHS Supervisor (as applicable to the project components) who shall have the power to halt works until corrective action is taken.
30. Within 3 days of receiving the application, if not informally resolved by the EPC contractor, the NEA focal will contact the applicant to acknowledge the receipt of the grievance, provide a complaint registration number, and set up a meeting in presence of the contractor's project manager. A formal reply will be addressed to the complainant who will be informed about the process and of his/her possibility to subsequently escalate the complaint in case no resolution was found at this stage. The contact to the second GRM will also be included. Other participants such as contractor's environment, health and safety officers, subcontractor's representative, PMD or PSC safeguard staff on site etc. can be called to the meeting. The affected person(s) may come in presence of two representatives of their choice (selected to be gender inclusive), including a representative of their IP group if applicable. To keep this first level simple, the number of meeting attendees will be kept as much as possible to between 4 and 8, but ideally 4, for flexibility and ease of dialogue.
31. The first meeting shall take place no later than one week after receipt of the grievance/complaint, as the timeline for addressing the resolution will be 7 days from initial receipt. If the complainant has difficulty to travel to meeting location upon short notice, the location and timing of the meeting may be flexible. The complainant and the NEA site level focus will discuss and try to agree on the course of action to be taken to resolve the complaint. The duration for this course of action will also be discussed and agreed upon. Minutes of the meeting will be kept with signatures of all the participants to document the GRM process and will be annexed in the GRM file. If both parties agree on the resolution, steps will be taken as per agreed resolution. If both parties do not agree on a resolution, the complaint may be escalated to the second level of GRM.
32. Once resolved the NEA focal will oversee remedial action, keeping the complainant informed at each stage or every fortnight, whichever is the shortest. Such actions should be taken in the briefest delay, within a maximum time frame of 30 days. However, all simple complaints will be resolved within 7 days of the meeting being held.

33. Following resolution, if the complainant is not happy with the resolution or if no action has been taken within the agreed timeframe, they can escalate the grievance to the second level of GRM.
34. A log of all active complaints, even if resolved informally or formally within the first level of GRM, must be communicated to PMD GRM focal fortnightly by the NEA on-site focal.
35. **2<sup>nd</sup> Level Grievance (PMD Level):** The second level of GRM is headed by the PMD project manager, supported by field level staff. If a complaint has not been resolved at the first level of GRM within 7 days of initial receipt, or earlier if the first level feel it cannot be addressed at site, it is escalated to the second level. All complaints will again be sorted by eligibility and level of urgency and by nature (suggestions or comments, grievances/complaints related to adverse impacts of the project components on an individual or group, violations of law, etc.). Just as for the first level, all grievances will be properly recorded, and the concerned person or group will be formally informed of the receipt; timeline; and resolution. The PMD GRM focal will send within 3 days of receipt to the second level a letter to the complainant acknowledging receipt; within 15 days a meeting should be held, and resolution action plan and timeline agreed upon with the complainant.
36. The meeting should aim to have between 4 and 8 members, including PMD project manager, PMU GRM focal, the complainant who may be accompanied by or represented by two representatives including one IP representative if applicable, PMU environment, health and safety officers, as well as other members if applicable, including EPC Contractor's representative, local rural office representative, community organization representative etc. As for the first level, the second level may have two outcomes: if the parties found a resolution and the complainant signed their approval of the resolution, such actions should be taken in the briefest delay, within a maximum time frame of 30 days. However, all simple complaints will be resolved within 7 days of the meeting being held. If no resolution has been reached, the grievance is forwarded to the third level of the GRM.
37. **3<sup>rd</sup> Level Grievance (PMD and CDO Level):** In the third level GRM, the same process of logging the grievance/complaint, communicating with the complainant and reporting will be followed. The third level of GRM is handled by a grievance redress committee (GRC) formed by the PMD Director and headed by the Chief District Officer (CDO), District Administration Office who will chair the meeting made up of the NEA PMD Director, PMU Environmental Officer and H&S Officer (depending on the nature of the complaint), two representatives of the complainant including indigenous peoples representative if applicable, as well as, as applicable, a representative of the contractor, government representatives for environment or social issues (such as but not limited to land revenue, survey, forest office, agriculture office, municipality representatives etc.), NGOs or CSOs representatives, etc. For ease of discussion, the GRC meeting will try to gather no more than 10 participants.
38. The grievance redress committee will agree on the resolution approach and action plan, inform concerned parties about actions to be taken and their timeline, and will monitor progress through regular follow-ups. Resolution will be as prompt as possible; receipt of complaint will be acknowledged to the complainant within 3 days, the resolution approach agreed upon within 15 days and actions taken within 45 days. However, all simple complaints will be resolved within 7 days of the meeting being held. Approval of the resolution by the complainant will be sought in writing. If the complainant is still dissatisfied after this stage, they may avail of the court of law or ADB's Accountability Mechanism.
39. All entries to the site's grievance/complaints register, whether resolved at initial informal level on site or at any of the three levels of the GRM, along with updates on ongoing or

completed actions taken to address the grievance/complaint, will be included in monthly reports by the Contractor to PMD and in periodic monitoring reports from PMD to ADB.



**GRM Diagram**



40. PMD ESMU Grievance Redressal Unit will monitor the overall grievance resolution process and will recommend any improvements to increase the efficiency, timeliness, and fairness of the process.

**Summary responsibilities and timeline of GRM at different levels**

| GRM Level                        | Composition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Maximum timeline                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| First Level of GRM (site-level)  | <p>Responsibility: Informal level by Contractor's project manager supported by contractor's community engagement officer/GRM focal</p> <p>Formal level by PMU field based staff/GRM focal</p> <p>Other parties involved, as applicable:</p> <ul style="list-style-type: none"> <li>- 2 representatives of affected person (gender inclusive, including 1 representative of IP group as applicable)</li> <li>- EPC Contractor's representative</li> <li>- Subcontractor's representative</li> <li>- PMU/PSC safeguard staff when on-site</li> </ul> <p>Total Meeting members: 4-8</p> | <p>3 days: confirmation of receipt to complaint if not resolved at the informal level</p> <p>7 days: meeting between contractor's project manager and complainant and action plan agreed upon (or escalation to level 2)</p> <p>Maximum 30 days: action taken, and grievance resolved, although any environment safeguard grievances that are an emergency or pose a health and safety risk to workers or community members must be resolved immediately by the contractor.</p> <p>Information and reporting to NEA site level GRM focal on two-weekly basis by contractor, and same from NEA site level to PMU GRM focal.</p> |
| Second Level GRM (project-level) | <p>Responsibility: PMU project manager supported by the PMU GRM focal</p> <p>Other parties involved, as applicable:</p> <ul style="list-style-type: none"> <li>- 2 representatives of affected persons (gender inclusive, including 1 representative of IP group as applicable)</li> </ul>                                                                                                                                                                                                                                                                                           | <p>3 days: confirmation of receipt to complaint</p> <p>15 days: meeting between project manager and complaint and action plan agreed upon (or escalation to level 3)</p> <p>Maximum 30 days: action taken, and grievance resolved.</p>                                                                                                                                                                                                                                                                                                                                                                                         |

|                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                       |
|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                      | <ul style="list-style-type: none"> <li>– Representative of the contractor</li> <li>– PMU environment, health and safety officers as applicable depending on environment or social issues being resolved.</li> <li>– Local rural office and community organization representative</li> </ul> <p>Total meeting members: 4-8</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Information and reporting to NEA GRM focal.                                                                                                                                                                                                           |
| Third Level of GRM (committee-level) | <p>Responsibility: Chief District Officer, District Administration Office as chair; PMD Director as facilitator with support of PMU GRM focal</p> <p>Other parties involved, as applicable:</p> <ul style="list-style-type: none"> <li>– 2 representatives of affected persons (gender inclusive, including 1 representative of IP group as applicable)</li> <li>– PMU environment, health and safety officers</li> <li>– Representative of the contractor</li> <li>– Government representatives as applicable depending on environment or social issues being resolved (e.g., land revenue, survey, forest office, agriculture office, municipality representative etc.)</li> <li>– NGOs/CSOs representatives depending on environment or social issues being resolved.</li> <li>– Other as applicable</li> </ul> <p>Total Meeting Members: &lt;10</p> | <p>3 days: confirmation of receipt to complaint</p> <p>15 days: grievance redress committee meeting and action plan agreed upon.</p> <p>Maximum 45 days: action taken, and grievance resolved.</p> <p>Information and reporting to NEA GRM focal.</p> |

## **G. Disclosure on GRM**

41. The formation and effectiveness of GRM will be communicated to the affected people across the project areas of influence as part of overall consultation and disclosure process of the project. It will be publicized widely through community meetings and pamphlets and information on focal contact persons, how to file grievance etc. will be placed on the billboards of the construction sites/project site offices in local language so that people are aware of their rights and obligations, and procedure of grievance redress. The EPC contractors and PSC will assist NEA in disseminating the GRM related information to the people. Special efforts should be made to ensure that poor and vulnerable households are made aware of grievance redress procedures and entitlements. Grievances will be filed without any fear and stress and stakeholders may also raise grievances anonymously if they so wish through a drop box on site. ADB's accountability mechanism will also be informed to the Affected People by PMD.
42. Communities within the project's area of influence (e.g., within 500m of substations and transmission lines) will be made aware of this GRM as well as how to access it, including addresses and contact numbers, through (i) community awareness raising during community or one-on-one meetings; (ii) pamphlets distributed to the general public in the direct vicinity of the project sites, in Nepali and other local languages; and (iii) notices on the social media/cable and/or local newspaper, as well as notice boards on project-sites, at substations, NEA's local offices, in local government/Ward offices, and on NEA's website etc. with details of the GRM together with details of the project and where the IEE/EMRs can be obtained to capture a wider audience. Pre-construction and once operational, NEA will be responsible to post clearly visible signboards at the project sites (banner on mobile vans/trucks carrying distribution line materials and workers) with contact details including the name and phone number of their GRM focal person, together with suggestion boxes (mobile that can be placed next to working area) that will be regularly checked for any grievances received. During construction, the contractor will be responsible for posting these signboards, including contact details with the names and phone numbers of both NEA and contractor's GRM focal persons as well as the suggestion box to be regularly checked at the construction site. The information will be specifically related to the construction works and provided in local language describing the project, the grievance mechanism and where and whom stakeholders can deliver their complaints, and in what form, verbal or written.
43. Any concerned person or group of people can file a complaint through the project's GRM, at any time and at no cost. The time frame for receiving a response will be made known to the grievant. Investigations and deliberations on the grievances will be communicated to the grievant and outcomes publicly disclosed.
44. NEA, PSC and contractor's focals will actively engage with the affected local communities and construction workers throughout pre-construction, construction and at the onset of operation, providing an opportunity for community members or workers to approach them with any grievance/complaint. Affected peoples may also lodge grievances/complaints online through NEA's website with dedicated link/message box, by phone/WhatsApp at numbers provided, by submitting a note in a suggestion box kept on site, by sending a letter, or in person at a project-site office or at the NEA's closest office or through the local government representatives.
45. All costs involved in resolving the complaints/grievances (meetings, consultations, communication, and reporting/information dissemination) will be borne by NEA and any complaints resolution pertaining to EPC contractors and the EMP related complaints will be borne by the EPC contractors.

## GRIEVANCE REDRESS FORM

(to be available in Nepali or other local languages)

NEA welcomes complaints, suggestions, queries, and comments regarding the project implementation. We encourage any person or group with a grievance to provide their name and contact information to get in touch with you for clarification and feedback. Should you choose to include your details but want that information to remain confidential, please inform us by writing/typing **\*(CONFIDENTIAL)\*** above your name. Gender and age do not have to be given.

Thank you.

| Grievance Form: Project Component                                                                                                                                                   |                                           |                                           |                                                       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------------------------------------------|-------------------------------------------------------|
| Grievance registration number:                                                                                                                                                      |                                           |                                           |                                                       |
| Contact details<br>(may be submitted<br>anonymously)                                                                                                                                | Name (s):                                 |                                           |                                                       |
|                                                                                                                                                                                     | Male/female:                              |                                           |                                                       |
|                                                                                                                                                                                     | Age:                                      |                                           |                                                       |
|                                                                                                                                                                                     | Address:                                  |                                           |                                                       |
|                                                                                                                                                                                     | Village:<br>District:                     |                                           |                                                       |
|                                                                                                                                                                                     | Telephone/Mobile:                         |                                           |                                                       |
|                                                                                                                                                                                     | Email:                                    |                                           |                                                       |
| How would you prefer<br>to be contacted (check<br>one)                                                                                                                              | By mail/post:<br><input type="checkbox"/> | By phone/SMS:<br><input type="checkbox"/> | By email<br><input type="checkbox"/>                  |
| Preferred language                                                                                                                                                                  | <input type="checkbox"/> Nepali           | <input type="checkbox"/> English          | <input type="checkbox"/> Other<br>Please state: _____ |
| Provide details of your grievance. Please describe the problem, type, who it happened to, when and where it happened, how many times, etc. Describe in as much detail as possible.* |                                           |                                           |                                                       |
| What is your suggested resolution for the grievance if you have one? Is there something you would like NEA or another party/person to do to solve the problem?*                     |                                           |                                           |                                                       |
| <b>*Note: You may attach a document, letter, or note in the grievance form</b>                                                                                                      |                                           |                                           |                                                       |
| How have you<br>submitted this form to<br>the project?                                                                                                                              | Website<br><input type="checkbox"/>       | Email<br><input type="checkbox"/>         | By hand<br><input type="checkbox"/>                   |
|                                                                                                                                                                                     | In person<br><input type="checkbox"/>     | By telephone<br><input type="checkbox"/>  | Other (specify)<br><input type="checkbox"/>           |
| How do you want us to<br>reach you for<br>feedback or updates<br>on your<br>comment/grievance?                                                                                      |                                           |                                           |                                                       |
| Who filled out this<br>form (If not the person<br>named above)?                                                                                                                     | Name and contact details:                 |                                           |                                                       |
| Signature and Date                                                                                                                                                                  |                                           |                                           |                                                       |
| <b>OFFICIAL USE ONLY</b>                                                                                                                                                            |                                           |                                           |                                                       |
| Date and place of<br>registration                                                                                                                                                   |                                           |                                           |                                                       |
| Name of NEA's officer<br>registering?                                                                                                                                               |                                           |                                           |                                                       |



|                                               |                                   |                                   |                    |                           |
|-----------------------------------------------|-----------------------------------|-----------------------------------|--------------------|---------------------------|
| Initial acknowledgement given                 | Yes/No If yes, date:              |                                   |                    |                           |
| Name of NEA's officer assigned responsibility |                                   |                                   |                    |                           |
| Level 1 Meeting Convened?                     | Yes/No If yes, date:              | Details (attach minutes etc.)     |                    |                           |
| Resolved on site or referred to Level 1?      | <input type="checkbox"/> Resolved | <input type="checkbox"/> Referred | If referred, date: |                           |
| Level 2 Meeting Convened?                     | Yes/No If yes, date:              | Details (attach minutes etc.)     |                    |                           |
| Resolved referred to Level 2?                 | <input type="checkbox"/> Resolved | <input type="checkbox"/> Referred | If referred, date: |                           |
| Level 3 Meeting Convened?                     | Yes/No If yes, date:              | Details (attach minutes etc.)     |                    |                           |
| Resolved referred to Level 3?                 | <input type="checkbox"/> Resolved | <input type="checkbox"/> Referred | If referred, date: |                           |
| <b>Completion</b>                             |                                   |                                   |                    |                           |
| Final resolution (briefly describe)           |                                   |                                   |                    |                           |
|                                               | Short description                 | Disclosed? (Y/N)                  | Accepted? (Y/N)    | Acknowledgement signature |
| 1 <sup>st</sup> proposed solution             |                                   |                                   |                    |                           |
| 2 <sup>nd</sup> proposed solution             |                                   |                                   |                    |                           |
| 3 <sup>rd</sup> proposed solution             |                                   |                                   |                    |                           |

Source: ADB's TA Consultant

### Template for GRM Register Record

| Registration number | Type (Env/ Soc/ H&S etc.) | Date of complaint | Details of complainant (name, address, email, contact number). If confidentiality is requested, highlight here. | Mode/ Entry point of complaint (person/ entity) | Description of complaint | Date and content of communication to complainant (date complaint acknowledged by level 1/2/3, feedback sent, etc.) | Date of meetings held and outcome (attach minutes of meetings ) | Timeline agreed upon for resolution and action plan | Status (outstanding, overdue, solution agreed upon, solution under implementation, resolved) | Other remarks |
|---------------------|---------------------------|-------------------|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|-----------------------------------------------------|----------------------------------------------------------------------------------------------|---------------|
|                     |                           |                   |                                                                                                                 |                                                 |                          |                                                                                                                    |                                                                 |                                                     |                                                                                              |               |
|                     |                           |                   |                                                                                                                 |                                                 |                          |                                                                                                                    |                                                                 |                                                     |                                                                                              |               |
|                     |                           |                   |                                                                                                                 |                                                 |                          |                                                                                                                    |                                                                 |                                                     |                                                                                              |               |
|                     |                           |                   |                                                                                                                 |                                                 |                          |                                                                                                                    |                                                                 |                                                     |                                                                                              |               |
|                     |                           |                   |                                                                                                                 |                                                 |                          |                                                                                                                    |                                                                 |                                                     |                                                                                              |               |

Source: ADB's TA Consultant

## Appendix 13: Sample Contractor Monitoring Sheet

### SAMPLE DAILY MONITORING SHEET FOR CONTRACTOR

(for finalization by PISC to reflect EMP and be project component and site-specific)

#### ELECTRICITY TRANSMISSION AND DISTRIBUTION STRENGTHENING PROJECT

#### Contractor Monitoring Checklist / Sheet

Name of Project Component/Package: \_\_\_\_\_

Location of Project Component/Package: \_\_\_\_\_

Contractor: \_\_\_\_\_

Contractor EHS Manager (or equivalent): \_\_\_\_\_

Date of monitoring: \_\_\_\_\_

#### Summary of Findings

| Monitoring Item                                     | Status                                                                | Remarks |
|-----------------------------------------------------|-----------------------------------------------------------------------|---------|
| <b>1. Compliance with Local Permit Requirements</b> | <b>(Secured / Application Submitted / Not Applicable)</b>             |         |
| <i>Location/zoning permits</i>                      |                                                                       |         |
| <i>Permit to construct</i>                          |                                                                       |         |
| <i>Building permit</i>                              |                                                                       |         |
| <i>Transport / hauling permits</i>                  |                                                                       |         |
| <b>2. Compliance with IEE Requirements</b>          | <b>(Approved / Under Preparation / Submitted to PMD for Approval)</b> |         |
| <i>Site-specific EMP (SEMP)</i>                     |                                                                       |         |
| <i>Corrective Action Plan, if any</i>               |                                                                       |         |
| <b>3. Compliance with SEMP</b>                      |                                                                       |         |
| <b>Construction Site</b>                            | <b>(Satisfactory / Needs Improvement / Not Implemented)</b>           |         |
| - Conduct of toolbox talk                           |                                                                       |         |
| - Use of PPE                                        |                                                                       |         |
| - Rest areas for male and female workers            |                                                                       |         |
| - Toilets for male and female workers               |                                                                       |         |
| - Medical kits                                      |                                                                       |         |
| - Drinking water supply                             |                                                                       |         |
| - Dust control                                      |                                                                       |         |



| Monitoring Item                                                          | Status                                                 | Remarks |
|--------------------------------------------------------------------------|--------------------------------------------------------|---------|
| - Noise control                                                          |                                                        |         |
| - Solid waste management                                                 |                                                        |         |
| - Wastewater management                                                  |                                                        |         |
| - Chemicals storage (fuel, oil, etc.)                                    |                                                        |         |
| - Siltation or erosion control                                           |                                                        |         |
| - Heavy equipment staging / parking area                                 |                                                        |         |
| - Barricades around excavation sites                                     |                                                        |         |
| - Access to residential houses/shops/businesses                          |                                                        |         |
| - Traffic routing signages                                               |                                                        |         |
| - Lightings at night                                                     |                                                        |         |
| - Trench shoring / landslide protection                                  |                                                        |         |
| <b>Construction Workers' Camp Site</b>                                   | <b>(Available / Needs Improvement / Not Available)</b> |         |
| - Quarters for male and female workers                                   |                                                        |         |
| - Sleeping utilities (e.g. beds, pillows, blankets, mosquito nets, etc.) |                                                        |         |
| - Power/Electricity supply                                               |                                                        |         |
| - Drinking water supply                                                  |                                                        |         |
| - Toilets for male and female workers                                    |                                                        |         |
| - General purpose water supply (cooking, washing, bathing)               |                                                        |         |
| - Cooking facilities and areas                                           |                                                        |         |
| - Solid waste management                                                 |                                                        |         |
| - Wastewater management                                                  |                                                        |         |
| - Pest control                                                           |                                                        |         |
| <b>4. Implementation of GRM</b>                                          | <b>(Yes / No or None / Under Resolution)</b>           |         |

| Monitoring Item                             | Status                                    | Remarks |
|---------------------------------------------|-------------------------------------------|---------|
| <i>Complaints</i>                           |                                           |         |
| <i>Complaints resolution</i>                |                                           |         |
| <b>5. Environmental Quality Measurement</b> | <b>(Passed / Failed / Not Applicable)</b> |         |
| <i>Ambient air quality sampling</i>         |                                           |         |
| <i>Noise level measurement</i>              |                                           |         |
| <i>Receiving water quality sampling</i>     |                                           |         |

**Other Issues:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Attachments:**

1. Copies of permits secured, if any.
2. Photos taken at worksites, if any.  
(photos attached in previous monitoring sheets should not be used again).
3. Laboratory results of environmental quality measurements, if any.

**Prepared by:** \_\_\_\_\_

Name, Designation and Signature

## Appendix 14: Contractors Environmental Monitoring Report Template



# Contractor's Monthly Environmental Monitoring Report

---

Reporting Period {Month Year}  
Submission Date {Day Month Year}

{Project Name, Contract Package/Lot}

Prepared by {Contractor} for NEA



## 1.0 Introduction

{Succinctly convey the details of the contract package/lot, details of construction camps and other temporary facilities}

{Highlight any unanticipated impacts in relation to change in the project scope, locations or alignments of components no matter how minor the contractor considers they may be, construction methods, and/or implementation schedule during the reporting period, if none confirm this.}

{Describe the implementation stage reached (design, pre-construction, construction, commissioning) and the % progress, main project activities and milestones achieved during the reporting period. Report on updates to IEE/EMP that were required during the reporting period, status of delivery of documents, permissions received, required amendments, consultation and disclosure undertaken etc.}

{Include table and/or organogram of environmental safeguards staffing at contractors/subcontractors and relationships between subcontractors, etc. Highlight any changes in the project organization and environmental safeguards staffing during the reporting period, if none confirm this}

### Details of Contract

| Contract Package/Lot | Scope of Work | Contract Amount | Appointed Date | Expected Date of Completion |
|----------------------|---------------|-----------------|----------------|-----------------------------|
|                      |               |                 |                |                             |

### Scope of Works / Summary of Construction Progress

| Name | Scope including km for distribution lines | Stage Reached (Design/Construction/Commissioning) | Construction Progress Status |
|------|-------------------------------------------|---------------------------------------------------|------------------------------|
|      |                                           |                                                   |                              |
|      |                                           |                                                   |                              |
|      |                                           |                                                   |                              |
|      |                                           |                                                   |                              |
|      |                                           |                                                   |                              |
|      |                                           |                                                   |                              |

### Environmental, Health & Safety Staff

| Name | Designation | Location | Mobile | Email address | Mobilization Date (Demobilization Date if Applicable) | Total Days Absent in last month | Total present (Months) |
|------|-------------|----------|--------|---------------|-------------------------------------------------------|---------------------------------|------------------------|
|      |             |          |        |               |                                                       |                                 |                        |
|      |             |          |        |               |                                                       |                                 |                        |
|      |             |          |        |               |                                                       |                                 |                        |
|      |             |          |        |               |                                                       |                                 |                        |
|      |             |          |        |               |                                                       |                                 |                        |

### Details of Temporary Facilities Established as on Month Year

| Sl. No. | Type e.g., stores | Name | Location | Landowner | Details e.g., capacity | CTE Date | CTO Date | Remarks on Status |
|---------|-------------------|------|----------|-----------|------------------------|----------|----------|-------------------|
| 1       |                   |      |          |           |                        |          |          |                   |
| 2       |                   |      |          |           |                        |          |          |                   |

### Details of Temporary Labour Camps Established as on Month Year (if applicable)

| Sl. No. | Camp Name | Camp Location | Occupants (No.) | Grade | Facilities                                                                                                         |
|---------|-----------|---------------|-----------------|-------|--------------------------------------------------------------------------------------------------------------------|
| 1       |           |               |                 |       | <ul style="list-style-type: none"> <li>Toilets: XX No.</li> <li>Lodging: XX No.</li> <li>Kitchen XX No.</li> </ul> |
| 2       |           |               |                 |       | <ul style="list-style-type: none"> <li>Toilets: XX No.</li> <li>Lodging: XX No.</li> <li>Kitchen XX No.</li> </ul> |
| 3       |           |               |                 |       | <ul style="list-style-type: none"> <li>Toilets: XX No.</li> <li>Lodging: XX No.</li> <li>Kitchen XX No.</li> </ul> |
| 4       |           |               |                 |       | <ul style="list-style-type: none"> <li>Toilets: XX No.</li> <li>Lodging: XX No.</li> <li>Kitchen XX No.</li> </ul> |
| 5       |           |               |                 |       | <ul style="list-style-type: none"> <li>Toilets: XX No.</li> <li>Lodging: XX No.</li> <li>Kitchen XX No.</li> </ul> |

## 2.0 Compliance to National Regulations and International Agreements

{Status of compliance and further action to ensure ongoing compliance; if there is partial or no compliance recommendations for corrective action are required. Provide explanations of any instances where the requirements of regulations or agreements were breached along with details of responses taken to rectify the breach once identified. Include all the applicable National Regulations and International Agreements following the sample table below attaching copy of the consents/license in the period they were obtained}

**Status of Legal Compliance as of Month Year**

| Sl. No. | Activities                                                     | Statutory Authority | Status (Yes, No or Partial only) |          | Expiry Date | Remarks                   |
|---------|----------------------------------------------------------------|---------------------|----------------------------------|----------|-------------|---------------------------|
|         |                                                                |                     | Applied                          | Obtained |             |                           |
| 1       | Labour License                                                 |                     |                                  |          |             | License No. xxx dated xxx |
| 2       | Registration of Vehicles/ Pollution Under Control Certificates |                     |                                  |          |             |                           |
| 3       | Other...                                                       |                     |                                  |          |             |                           |

## 3.0 Compliance to Environmental Management Plan

{With reference to the EMP of the project, include a table following sample table below with the compliance status during the reporting period, with sufficient details (evidence) to show how compliance was achieved, or corrective action to be taken if there was non-compliance including timeline and budget}

{Flag if previous environmental monitoring report(s) included corrective action plan, if it did details of that corrective action plan should be incorporated into the EMP table and compliance status reported}

{Provide explanations of any instances where performance standards were temporarily exceeded during the reporting period, along with details of any response taken to rectify the

exceedance once identified, even if at the end of the reporting period the project is deemed as being compliant}

{Copies of clearances, CEMP, construction method statements, and other documentation produced in accordance with EMP during the reporting period should be included as an Appendix}

| Item # | Requirement | Prior Corrective Action | Compliance Status<br>{complied;<br>partially<br>complied;<br>not complied;<br>still ongoing or<br>n/a at current<br>stage of the<br>project} | Remarks {provide<br>sufficient details<br>(evidence) to show how<br>compliance was<br>achieved; or explain the<br>corrective action to be<br>taken if there was non-<br>compliance including<br>timeline and budget} |
|--------|-------------|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|        |             |                         |                                                                                                                                              |                                                                                                                                                                                                                      |
|        |             |                         |                                                                                                                                              |                                                                                                                                                                                                                      |
|        |             |                         |                                                                                                                                              |                                                                                                                                                                                                                      |

#### 4.0 Environmental Supervision and Monitoring Results

{With reference to the contract budget earmarked for EMP (if any) summarize details of budget allocated and the current spend profile}

| Activity | Allocated Budget | % Spent | Remarks |
|----------|------------------|---------|---------|
|          |                  |         |         |
|          |                  |         |         |
|          |                  |         |         |
| TOTAL    |                  |         |         |

{With reference to the EMP capacity development plan summarize trainings for staff and subcontractors, and other activities completed. Include as appendices the training agenda, attendance sheets, and photos. If no trainings or other activities in reporting period, please confirm. Copies of training records related to EMP during the reporting period should be included as an Appendix}

| Trainings | Number and Position of Participant/s | Location/s and Date/s | Remarks |
|-----------|--------------------------------------|-----------------------|---------|
|           |                                      |                       |         |
|           |                                      |                       |         |
|           |                                      |                       |         |

{Site inspections and audits completed – summarize the number and type of site visits, persons involved, the issues covered, and status of compliance with them, the number of non-compliance notices given out to your own staff or sub-contractors because of the site visit, and the checklists/reporting format used (sample of checklists and reports to be included as an Appendix)}

| Date | Type and Purpose of Visit | Location/s Visited | EA, IA, Consultant Staff Participating | Remarks |
|------|---------------------------|--------------------|----------------------------------------|---------|
|      |                           |                    |                                        |         |
|      |                           |                    |                                        |         |
|      |                           |                    |                                        |         |

## 4.2 Quantitative Environmental Monitoring

{Environmental monitoring results – summarize in a table the reporting period’s quantitative monitoring activities and data obtained in accordance with the Environmental Monitoring Plan (EMoP) of the project. Provide explanations of any instances where performance standards were exceeded along with details of responses taken to rectify the exceedance once identified. Attach survey reports}

Typically, this section will include the results of:

- Flora and fauna surveys
- Air quality surveys
- Noise and vibration surveys
- Water quality surveys

{Indicate monitoring locations using a map or plan with grid coordinates, dates, times, duration of samples as applicable, weather conditions as applicable, parameters measured, equipment used, standards, tests, and limits used etc.}

{Corrective actions with timeline and budget are required to ensure any exceedances will be prevented in the future}

{Calibration and QA certifications of monitoring equipment and laboratories analyzing samples should be included as an Appendix}

### Ambient Air Quality Monitoring Results

| Name of sampling site                                          | Geo-Coordinates | Parameters       |                   |                 |                 |    |     |
|----------------------------------------------------------------|-----------------|------------------|-------------------|-----------------|-----------------|----|-----|
|                                                                |                 | PM <sub>10</sub> | PM <sub>2.5</sub> | SO <sub>2</sub> | NO <sub>2</sub> | CO | ... |
| Location xx                                                    |                 |                  |                   |                 |                 |    |     |
| Location xx                                                    |                 |                  |                   |                 |                 |    |     |
| Stack emission of DG<br>Location xx (xx KVA)                   |                 |                  |                   |                 |                 |    |     |
| Stack emission of DG<br>Location xx (xx KVA)                   |                 |                  |                   |                 |                 |    |     |
| National Air Quality Standards <sup>12</sup>                   |                 | 120              | 40                | 70              | 80              |    | ... |
| Project standard <sup>a</sup>                                  |                 | 45               | 15                | 40              | 25              |    |     |
| Emission Limits for Diesel generator set 130≤KW< <sup>13</sup> |                 | 0.2              |                   | -               | 4 <sup>b</sup>  |    |     |

<sup>a</sup> Most Stringent among GoN vs IFC EHS vs WHO AQG 2021

<sup>b</sup> NO<sub>x</sub>+HC

### Ambient Noise Quality Monitoring Results

| Name of sampling site | Geo Coordinates | Parameters |             | National Standards <sup>a</sup> |           | Remarks |
|-----------------------|-----------------|------------|-------------|---------------------------------|-----------|---------|
|                       |                 | Leq (Day)  | Leq (Night) | Day time                        | Nighttime |         |
| Location xx           |                 |            |             | 45                              | 40        |         |
| Location xx           |                 |            |             |                                 |           |         |
| DG at Location xx     |                 |            |             |                                 |           |         |
| DG at Location xx     |                 |            |             |                                 |           |         |

<sup>12</sup>

[https://nepalindata.com/media/resources/bulkuploaded/National\\_Ambient\\_Air\\_Quality\\_Standard\\_2012\\_july17.pdf](https://nepalindata.com/media/resources/bulkuploaded/National_Ambient_Air_Quality_Standard_2012_july17.pdf)

<sup>13</sup> Emission Standard for Diesel Generator 2069

<sup>a</sup> Noise criteria applicable: most stringent of GoN vs IFC EHS guidelines. Highlighted data: exceedance of criteria. Peaceful zone criteria of GoN apply where temples present

### Drinking Water Quality Monitoring Results

| S.N. | Parameters              | Location    |             |             | National Drinking Water Quality Standards |           |
|------|-------------------------|-------------|-------------|-------------|-------------------------------------------|-----------|
|      |                         | Location xx | Location xx | Location xx | Limits                                    |           |
| 1    | Turbidity               |             |             |             | 5                                         | NTU       |
| 2    | pH                      |             |             |             | 6.5 – 8.5                                 |           |
| 3    | Color                   |             |             |             | 5                                         | TCU       |
| 4    | Taste and Odor          |             |             |             | Should not be offensive                   |           |
| 5    | Electrical Conductivity |             |             |             | 1500                                      | μS/cm     |
| 6    | Iron                    |             |             |             | 0.3 (3)                                   | mg/l      |
| 7    | Manganese               |             |             |             | 0.2                                       | mg/l      |
| 8    | Arsenic                 |             |             |             | 0.05                                      | mg/l      |
| 9    | Fluoride                |             |             |             | 0.5-1.5 (min-max)                         | mg/l      |
| 10   | Ammonia                 |             |             |             | 1.5                                       | mg/l      |
| 11   | Chloride                |             |             |             | 250                                       | mg/l      |
| 12   | Sulphate                |             |             |             | 250                                       | mg/l      |
| 13   | Nitrate                 |             |             |             | 50                                        | mg/l      |
| 14   | Copper                  |             |             |             | 1                                         | mg/l      |
| 15   | Zinc                    |             |             |             | 3                                         | mg/l      |
| 16   | Aluminium               |             |             |             | 0.2                                       | mg/l      |
| 17   | Total Hardness          |             |             |             | 500                                       | mg/l      |
| 18   | Residual Chlorine       |             |             |             | 0.1 - 0.5                                 | mg/l      |
| 19   | E-coli                  |             |             |             | 0                                         | CFU/100ml |
| 20   | Total Coliform          |             |             |             | 0                                         | CFU/100ml |

### 4.3 Pollution Control Monitoring

{Pollution control monitoring results – summarize any pollution incidents during the reporting period in accordance with the Environmental Monitoring Plan (EMoP) of the project. Provide explanations of any instances where performance standards were exceeded along with details of responses taken to rectify the exceedance once identified}

{Corrective actions with timeline and budget are required to ensure any exceedances will be prevented in the future}

{Include the pollution control trainings/drills/inspections conducted during the reporting period following the sample table below. Include as appendices the training/drill/inspection agenda, attendance sheets, and photos. If no trainings/drills/inspections, please confirm}

| Trainings/Drills/Inspections | Number and Position of Participant/s | Location/s and Date/s   | Remarks                                           |
|------------------------------|--------------------------------------|-------------------------|---------------------------------------------------|
| Example: Oil Spill Drill     | 50 Laborers                          | Substation, 15 Aug 2018 | Participants safely controlled simulated spill... |
|                              |                                      |                         |                                                   |
|                              |                                      |                         |                                                   |

{If there were any materials used, solid or hazardous waste, or wastewater generated in the reporting period report following the sample table below. If no materials used or waste generated, please confirm}

| Type of Materials/Waste                                                                                   | Approximate Volume (units) | Source or Destination | Remarks |
|-----------------------------------------------------------------------------------------------------------|----------------------------|-----------------------|---------|
| Material examples:<br>Transformer Oil<br>Sand for Fill                                                    |                            |                       |         |
| Waste examples:<br>Sanitary<br>Wastewater<br>Spoil from Earthworks<br>Old Transformers<br>Hazardous Waste |                            |                       |         |
|                                                                                                           |                            |                       |         |
|                                                                                                           |                            |                       |         |
|                                                                                                           |                            |                       |         |

#### 4.4 Occupational and Community Health and Safety Monitoring

| Type         | Number Worker |                 |                        |       | Employment Type |                         |           |
|--------------|---------------|-----------------|------------------------|-------|-----------------|-------------------------|-----------|
|              | Local         | Migrant (State) | Migrant (Out of State) | Total | Casual          | Contracted (outsourced) | Permanent |
| Unskilled    |               |                 |                        |       |                 |                         |           |
| Semi-skilled |               |                 |                        |       |                 |                         |           |
| Skilled      |               |                 |                        |       |                 |                         |           |
| <b>Total</b> |               |                 |                        |       |                 |                         |           |

#### Status of PPEs on Month Year

| Sl. No | PPE                                | Opening Stock | Distributed | Closing Stock | Ordered |
|--------|------------------------------------|---------------|-------------|---------------|---------|
|        | Helmets – Labourers (Yellow)       |               |             |               |         |
|        | Helmets – Supervisors (colour)     |               |             |               |         |
|        | Helmets – Engineers (colour)       |               |             |               |         |
|        | Helmets – EHS (Green)              |               |             |               |         |
|        | Helmets – Visitors (colour)        |               |             |               |         |
|        | Helmets – Others (colour)          |               |             |               |         |
|        | Gloves                             |               |             |               |         |
|        | Masks                              |               |             |               |         |
|        | Goggles                            |               |             |               |         |
|        | Safety Shoes                       |               |             |               |         |
|        | Gum boots                          |               |             |               |         |
|        | Safety Tackles                     |               |             |               |         |
|        | Safety Jacket – Labourers (colour) |               |             |               |         |
|        | Safety Jacket - Engineers (colour) |               |             |               |         |
|        | Safety Jacket – Others (colour)    |               |             |               |         |
|        | Others, please specify             |               |             |               |         |

**Details of First Aider as on Month Year**

| Name | Qualification | Years of Experience | Deployment Date | Employment Status |
|------|---------------|---------------------|-----------------|-------------------|
|      |               |                     |                 |                   |
|      |               |                     |                 |                   |

**Details of Hospitals and Doctors Tied Up With**

| Name | Location | Distance from Site | MoU Number | Date of MoU | Facilities offered | Expiry Date |
|------|----------|--------------------|------------|-------------|--------------------|-------------|
|      |          |                    |            |             |                    |             |
|      |          |                    |            |             |                    |             |

**Details of First Aid Boxes and Fire Extinguishers in Project Site**

| Location | Size of Box | Date of last Inspection | Inspected by (Name and Designation) | Status of Inspection |
|----------|-------------|-------------------------|-------------------------------------|----------------------|
|          |             |                         |                                     |                      |
|          |             |                         |                                     |                      |

**Details of Ambulances in Project Site**

| Location | Vehicle Type | Vehicle Number | Date of last Inspection | Inspected by (Name and Designation) | Status of Inspection | Fitness Certificate Status |
|----------|--------------|----------------|-------------------------|-------------------------------------|----------------------|----------------------------|
|          |              |                |                         |                                     |                      |                            |
|          |              |                |                         |                                     |                      |                            |

{Health and safety monitoring results – summarize the reporting period's health and safety activities and data obtained in accordance with the Environmental Monitoring Plan (EMoP) of the project. Provide explanations of any instances where performance standards were exceeded along with details of responses taken to rectify the exceedance once identified}

{Corrective actions with timeline and budget are required to ensure any exceedances will be prevented in the future}

{Include the occupational and community trainings/drills/inspections conducted during the reporting period following the sample table below. Include as appendices the training/drill/inspection agenda, attendance sheets, and photos. If no trainings/drills/inspections, please confirm}

| Trainings/Drills/Inspections | Number and Position of Participant/s | Location/s and Date/s             | Remarks                                   |
|------------------------------|--------------------------------------|-----------------------------------|-------------------------------------------|
| Example:<br>Fire Drill       | 50 Laborers                          | Construction Camp,<br>15 Aug 2018 | Participants safely evacuated the site... |
|                              |                                      |                                   |                                           |
|                              |                                      |                                   |                                           |

| Health and Safety Statistics to Month End | Total to Date | For Month | Preceding Month (Comparator) |
|-------------------------------------------|---------------|-----------|------------------------------|
| Person-hours worked                       |               |           |                              |
| Person-days lost                          |               |           |                              |
| Safe person hours                         |               |           |                              |
| Fatality                                  |               |           |                              |
| Non-fatal Injury (Lost Time)              |               |           |                              |
| Non-fatal Injury (Minor)                  |               |           |                              |

| Health and Safety Statistics to Month End                               | Total to Date | For Month | Preceding Month (Comparator) |
|-------------------------------------------------------------------------|---------------|-----------|------------------------------|
| Near-miss                                                               |               |           |                              |
| Illness                                                                 |               |           |                              |
| Other Incidents e.g., any dangerous occurrences or unsafe acts observed |               |           |                              |

{If there was any near-miss or accident, illness, or other occupational or community health and safety related incident during the reporting period (or a previously reported incident with ongoing rectification) report following the sample table below. Include as appendices work safety checklists, incident reports, and other relevant supporting documents. If no incidents, please confirm}

|                                                                         | Number and Position of Person/s Involved | Location/s and Date/s of Incident | Detailed Description of Incident | Time-bound Corrective Action |
|-------------------------------------------------------------------------|------------------------------------------|-----------------------------------|----------------------------------|------------------------------|
| Fatality                                                                |                                          |                                   |                                  |                              |
| Non-fatal Injury (Lost Time)                                            |                                          |                                   |                                  |                              |
| Non-fatal Injury (Minor)                                                |                                          |                                   |                                  |                              |
| Near-miss                                                               |                                          |                                   |                                  |                              |
| Illness                                                                 |                                          |                                   |                                  |                              |
| Other Incidents e.g., any dangerous occurrences or unsafe acts observed |                                          |                                   |                                  |                              |

### Meaningful Consultation and Grievance Redress

{Meaningful consultation – report on any ongoing consultation undertaken, and main issues raised by consultees; detailed consultation records should be included as an Appendix. If no ongoing consultation, please confirm}

| Date | Format/Venue | Participants (Occupation, M/F) | Main Issues Raised |
|------|--------------|--------------------------------|--------------------|
|      |              |                                |                    |
|      |              |                                |                    |
|      |              |                                |                    |

| Grievances Received |                 | Grievances Status of Month |        | Total till Date Grievances Status |        |
|---------------------|-----------------|----------------------------|--------|-----------------------------------|--------|
| In Month            | Total till Date | Open                       | Closed | Open                              | Closed |
|                     |                 |                            |        |                                   |        |

{If there was any grievance or complaint, regardless informal or minor, during the reporting period (or previously reported complaint with ongoing rectification) provide the corrective action taken following the sample table below. Detailed grievance records and response reports should be included as an Appendix}

| Complainant/s<br>or Affected<br>Persons | Location/s<br>and Date/s of<br>Complaint | Description of<br>Grievance/Complaint | Timeline* | Time-bound<br>Corrective<br>Action |
|-----------------------------------------|------------------------------------------|---------------------------------------|-----------|------------------------------------|
|                                         |                                          |                                       |           |                                    |
|                                         |                                          |                                       |           |                                    |
|                                         |                                          |                                       |           |                                    |

\* To be solved within 2 weeks

## 8.0 Conclusions and Recommendations

{Summarize the contract's environmental performance during the reporting period based on the previous sections and, if any non-compliance identified, provide detailed recommendations including responsibilities, timeliness and budget for the preparation and completion of corrective action}

{If non-compliance is major or not readily addressed then a separate corrective action plan may need to be prepared. For minor and readily addressed non-compliances the corrective action plan can be incorporated into this final section of the environmental monitoring report following the sample table below}

| Non-compliance | Corrective Action to be Taken | Responsibility | Timeline | Budget |
|----------------|-------------------------------|----------------|----------|--------|
|                |                               |                |          |        |
|                |                               |                |          |        |
|                |                               |                |          |        |

## APPENDICES

**Photographs** {Include relevant photographs of the project site and project area of influence taken during the reporting period to provide evidence of compliance and/or non-compliance. For each photo, provide a caption with description of what it illustrates, accurate location, and date taken}

### Supporting Documents

{E.g., Maps and plans  
Sample checklists and reports  
Clearances and documentation  
Training records  
Detailed monitoring data, laboratory results etc.  
Calibration and QA certificates  
Consultation records  
Meeting agendas and attendance records  
Grievance records  
Environment, health and safety reports}

## Appendix 2: Environmental Codes of Practice

The contractor shall acquaint themselves with the project-level EMP as well as the national and state EHS requirements of all the current statutes, ordinances, by-laws, rules and regulations or their instruments having the force of law including without limitation those relating to protection of the environment, social, health and safety, importation of labour, damages to property, protection of environment, etc. The contractor will take all necessary measures and precautions (i) to ensure that the execution of the works and all associated operations on site or offsite are carried out in conformity with these requirements, and (ii) to avoid any nuisance or disturbance to adjacent receptors/local community arising from the execution of works. The contractor shall record any incidents and the action taken to resolve the situation in a logbook. The contractor will also carry out daily on-site and off-site inspections at adjacent receptors to monitor compliance with the CEMP and subplans, levels of pollution (dust, waste etc.) experienced or any disruption/disturbance caused, record inspection results, and make the inspection log available when asked.

### Environment

#### Biodiversity

- Ensure clear demarcation of the working area, avoid encroachment outside the agreed corridor of impact.
- Site clearance including demolition, vegetation clearance, tree cutting and earthworks will be conducted cautiously under the supervision of an ecologist to minimize impacts on vegetation/trees/wildlife.
- In the first instance works will be scheduled outside the nesting and breeding seasons of fauna found at the project site, generally during and immediately after the monsoon season.
- Prior to demolition, vegetation clearance, tree cutting and earthworks including excavations for foundations, the construction area will be checked by an ecologist for any signs of nests, burrows etc. If nesting or burrowing animals are observed, then construction works will be postponed until any young are confirmed to have left the nest/burrow and adequate time has been given for adult animals to depart. In the interim they will be demarked to avoid accidental damage or disturbance being caused. If nest/burrows occupancy is unclear, only manual works under close supervision of an ecologist will be permitted. Only when this indicates no animals are likely to be harmed by the works must they proceed.
- Tree cutting and vegetation clearance will only be conducted after detailed tree enumeration inventory (of the number, location, size, and species of tree that they will need to cut) has been completed by the contractor, trees to be cut have been individually marked, and the trees / vegetation / shrubs to be removed have been surveyed by an ecologist to confirm that no nesting or roosting fauna is present.
- Similarly, buildings or structures will only be demolished after they have been surveyed by an ecologist to confirm that no nesting or roosting fauna is present. Only when an ecologist indicates no nesting/roosting animals are likely to be harmed must the works proceed.
- Under GoN Forest Rules 2023, tree cutting clearance is required from the Department of Forest. Expenses incurred for cutting trees and transportation is to be borne by the infrastructure developer. Rule 6 (1) Development projects can be given permission for movement of vehicles and persons In the forest with conditions.

- Ensure clear marking of vegetation to be removed before clearance, and supervision of clearing activities to ensure clearance is kept to a minimum. No globally threatened or nationally protected plant species will be cut.
- Excavated pits will be robustly fenced or covered to prevent fauna accidentally falling in, further an escape ramp will be provided to allow their escape.
- Use of herbicides or burning to clear vegetation or burning of vegetation trimmings is strictly prohibited.
- All fuel, oil, and chemicals stored, and all refueling will take place at least 100 m from dense vegetation/trees to minimize the risk of fire.
- Strict prohibition on the purchase, sale, and use of firewood, timber and NTFPs by contractor and their workers – trainings are to be provided.
- Strict prohibition on trapping, hunting, fishing, poaching or intentional injury of wildlife by contractor and their workers – trainings are to be provided so that workers know the threatened species that could potentially be encountered, and that they must not intentionally disturb or attack wild animals.
- Contractor to provide good standard of staff accommodation with heating and all meals to help discourage breaches of prohibition by the workers – provide alternative fuel source LPG / electric heaters for communal kitchens and for heating of employer provided staff accommodation.
- No litter, food or other foreign material will be thrown or left around the site and must be placed in covered garbage bins to prevent it being taken by bear, monkeys etc.
- Regular, compulsory awareness raising activities with support of the PMC ecologist will be undertaken to reinforce these biodiversity prohibitions with strict penalties as well as how to interact with wildlife encountered on site.
- Drivers employed to be skilled and receive training on to how to avoid traffic collisions with wildlife especially when driving at night on rural roads.
- Dispose of any invasive plant material encountered in an ecologically sound manner.
- Imported materials must be free of any invasive plant material, certification of the same to be submitted to NEA for all the imported sand, gravel, and landscaping related material.
- Maintain records of sightings, supported by photographs, of any threatened species observed (identified by ecologist) or any animal casualties occurring at the project site or in traffic collision, including a cause of death if known, to be reported to NEA and District and other Forest Officials.
- From one hour after sunrise to one hour before sunset no noisy works will be permitted, to minimize disturbance to fauna.
- If wildlife including that which poses a risk to human (snakes, leopards, bears etc.) is observed, no works will take place in that area and a protection zone will be clearly marked to prevent any accidental disturbance until the wildlife has left the area or has been safely rescued and released in suitable habitat outside the project footprint, with support of the Forest Officials.

### Chance Find Procedures

- Brief workers and drivers with the support of a local cultural heritage expert on the known physical cultural resources near the project site/along access roads and chance find protocol, the types of finds that will need to be reported and penalties applying for tampering with them through induction and toolbox talks before the commencement of any works.
- Implement chance find procedure as soon as any potential physical cultural resources encountered during construction activities.

- If suspected physical cultural resources are encountered, all works at the find site should be immediately halted. Strictly ensure no known physical cultural resources or chance finds are tampered with.
- Contractor to declare a chance find to NEA within 24 hours of find. NEA to report on any chance find having occurred within 48 hours to ADB.
- The find should be assessed by a competent official of government (Department of Archaeology, Nepal) and procedures to avoid, minimize or mitigate impacts to such physical cultural objects should then be agreed in writing with them.
- Services of a local cultural heritage expert to be procured by the contractor if they are required to handle chance finds.
- All artifacts, structures, articles of antiquity value and other remains of cultural/religious and archaeological significance to be reported and handled as per the Ancient Monument Preservation Act 2013 and Ancient Monument Preservation Rules 1989 as amended, and all other applicable national requirements
- Work will not begin or resume until the procedures to avoid, minimize, or mitigate impacts to the physical cultural resources have been agreed with Department of Archaeology and implemented in full.
- If avoidance is not feasible, and no alternatives to removal exist, cost-benefit assessment needs to be carried out to assess whether the project works should continue or stop at site. If the project benefits outweigh the anticipated cultural heritage loss from removal which is unlikely unless in case of resource of local value, following clearance of ADB, the physical cultural resources should be removed and preserved using the best available technique in accordance with relevant provisions of national heritage protection laws and decrees as well as international best archaeological practice.
- Records to be maintained of all finds, including chain of custody instructions for movable finds.

## **Pollution Prevention**

### ***Pollution from Construction Equipment, Plant and Vehicles***

- Use of modern equipment, exclude over-aged or worn-out equipment or vehicles from the construction site
- All equipment, plant, and vehicles used for construction works are of a modern design, use (i) battery or electric powered, or (ii) low GHG emission options where available.
- Take necessary measures to maintain all equipment in good condition. All equipment, plant, and vehicles including DG sets to be regularly serviced and maintained in good working order in accordance with manufacturer instructions and have passed applicable emission tests; keep log of maintenance work undertaken.
- Belching of black smoke prohibited.
- Prohibit engine idling
- All equipment, plant, and vehicles including DG sets to meet GoN emission standards and have the latest engine emission design (Euro III)
- All construction vehicles including those for transportation of personnel to have valid emission certificate
- Contractor will comply with gross vehicle and axle load limits
- Position any stationary emission sources (e.g., water pumps, diesel generators, compressors, etc.) as far as practical from the nearest properties

### ***Air Pollution (Dust)***

- Minimize the extent of earthworks and thus dust generation during construction.
- Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site
- Housekeeping of the site will be regularly carried out to minimize the fugitive emission from material handling areas, internal access roads, and construction waste storage areas.
- Stockpiles of spoil and other dust generating materials to be kept to a minimum necessary to undertake works for the day and covered with tarpaulin
- Minimize double handling (loading and unloading) and drop loads to reduce the dust generation
- Cover exposed soil with materials like gravel to minimize re-suspension of dust, consider seeding stockpiles if not required to be used immediately to minimize the windblown dust
- Locate stores/stockpiles of loose construction material (cement, sand aggregates etc.) least 100m from the adjacent properties and enclose them by a solid fence to reduce windblown dust.
- If not in an enclosed building/store keep stockpiles of loose soil, aggregate and waste materials covered with heavy tarpaulin to avoid suspension or dispersal during windy days.
- Trucks importing loose raw materials or removing spoil must be covered with tarpaulin tied down securely to the body of vehicles to reduce dust generation.
- Impose speed limits on construction vehicles on off- and on-site access roads to minimize exhaust and dust emissions especially where access roads run adjacent to properties
- Sprinkle earthworks, off- and on-site access roads that are not blacktopped, and material stockpiles with water during the construction period to avoid dust being dispersed by wind and mitigate dust related issues due to frequent movement of construction vehicles as necessary i.e., 2-3 times per day but more often if needed during excavations, dry and windy conditions that enable dust to be easily mobilized and the dust to be visible.
- Regularly clean dust from the off-site access roads during and immediately after construction work is completed.
- Strictly prohibit the burning of wastes generated by project-related activities.
- Avoid explosive blasting, using appropriate manual or mechanical alternatives
- Ensure workers working near or having long exposure to vehicle exhausts and earthworks are provided with clean N95 dust masks to avoid inhalation or particulate matter and other pollutants.
- Periodic medical respiratory checks to be performed on workers exposed to high dust levels.

### ***Noise and Vibration***

- Use of modern equipment, exclude over-aged or worn-out equipment or vehicles from the construction site
- All equipment, plant, and vehicles including DG sets to meet GoN noise emission standards.
- Select construction techniques and low noise generating equipment e.g., less than 55 dBA sound pressure level at 1m, and stage noisy works to limit their duration to minimize noise and vibration
- Fit all equipment and vehicles used in construction with exhaust silencers where the manufacturer's design allows this

- Position any stationary emission sources (e.g., water pumps, diesel generators, compressors, etc.) as far as practical from the nearest properties
- Prohibit engine idling
- Prohibit use of horn by construction vehicles
- Impose speed limits on construction vehicles on off- and on-site access roads to minimize noise emissions especially where access roads run adjacent to properties
- Provide appropriate PPE (acoustic ear plugs or earphones capable of reducing noise levels to 85 dB(A) for hearing protection) to any workers subjected to noise levels of 85 dBA for more than 8 hours per day and ensure they wear it e.g., if piling etc.
- No unprotected ear should be exposed to a peak sound pressure level (instantaneous) of more than 140 dB(C) or average maximum sound levels of 110 dB(A).
- Periodic medical hearing checks to be performed on workers exposed to high noise levels of 85 dBA for more than 8 hours per day.

### ***Soil and Water Pollution from Fuel, Oil, Chemical***

- Avoid storage of all fuel, oil, and chemicals in areas located within 100m of surface water and groundwater springs, etc. to avoid direct contamination or contamination through run off
- Establish dedicated fuel, oil, and chemicals stores (drums/containers/tanks) on impermeable bunded area of 110% volume to avoid spills and leaks contaminating soil and affecting water quality
- Secondary containment design to also consider means to prevent contact between incompatible materials in the event of a release.
- Drums, containers or tanks of fuel, oil, or chemicals to be labelled and kept in a designated, labelled storage area under lock and key when not in use.
- Place all drums or containers of fuel, oil, or chemicals on drip trays if not sited on impermeable surface with 110% bunded capacity.
- There should be no full or empty containers, tanks or drums that are left on open ground.
- Place all equipment that containing fuel or oil on drip trays it not sited on impermeable surface with 110% bunded capacity.
- Undertake refilling or refueling only on areas of hard protected soil, preferably bunded, at least 100m from surface water with all drainage directed through oil interceptors. No vehicle or equipment maintenance activities will be permitted to take place on open ground
- Provide drip trays/catch basins or other overflow/drip containment measures at connection points or possible overflow locations during refilling or refueling
- Maintain adequate supplies of spill containment equipment/absorbents such as sand immediately on-hand in the event of an incident
- Use of dripless hose connections for vehicle tanks and fixed connections with storage tanks
- Use dedicated fittings, pipes, and hoses on containers or tanks and regularly inspect their condition
- Use of refilling or refueling equipment that is compatible and suitable for the characteristics of the materials being transferred and designed to ensure safe transfer
- Overfills of drums, containers, and tanks to be prevented as they are among the most common causes of leaks and spills resulting in soil and water contamination, this can be achieved by:

- Checklist of measures to follow during filling operations
- Provision of automatic fill shutoff valves to prevent overfilling
- Installation of gauges on containers or tanks to measure volume inside
- Use of pipe connections with automatic overflow protection (float valve)
- Pumping less volume than available capacity by ordering less material than its available capacity
- Provision of overflow or over pressure vents that allow controlled release to a capture point
- Maintain procedures to prevent hazardous materials from being stored in incorrect containers or tanks
- Provide spill response kit with sufficient absorbent materials (e.g., sorbents, dry sand, sandbags) on-site for immediately soaking up any fuel, oil, or chemical leaks/spills that do accidentally occur
- Provision of oil-water separator on all drainage systems
- Do not allow washing of equipment or vehicles in surface water and ensure all washing water is discharged to sedimentation basin and oil interceptor instead of directly to surface water.
- Washing out concrete trucks will be prohibited on-site unless impermeable concrete washout area is provided specifically for this purpose; washouts to be emptied when 75% full.
- Cement will be stored in enclosed storage facilities and not exposed to the elements.
- Do not undertake any concrete mixing within 100m of surface water
- Spent engine oil from the equipment will be collected and sent for recycling and re-use.

### ***Soil And Water Pollution from Sanitation***

- Strict prohibition on open defecation and urination by construction workers
- No use of pit latrines
- Construction sites and employer provided staff accommodation will be equipped with toilets and washing facilities that do not discharge untreated water.
- Toilets and washing facilities to be connected to septic tank (with soakaway) – these will be located 100 m from any groundwater well (existing and new borewells) or alternatively sanitary facilities that do not allow the untreated disposal of sewage direct to adjacent water bodies or ground e.g., enclosed mobile toilets for disposal of wastewater off-site to the nearest municipal sewage treatment works will be used.
- No untreated wastewater is to be discharged direct to surface water or the ground
- Licensed contractors will be required to collect septage/sludge from septic tanks and mobile toilets on a regular basis for disposal to municipal wastewater treatment
- Regular maintenance will be undertaken for the sanitary sewage treatment system during construction and contractor will immediately rectify any overflows, leakage, foul odor etc.
- Contractor is to maintain a logbook of water abstracted and used as well as effluent generated.

### ***Soil Erosion and Surface Water Runoff Management***

- Works over or near watercourses will adopt protection measures to guard against loss of soil that would result in the turbidity of water.
- Implement measures to prevent landslides to avoid contamination of rivers by soil.
- Undertake construction during the dry season to minimize exposed areas subject to erosion by surface water runoff and to avoid flood risk, leading to accidents and/or water contamination.
- In the working area separately strip any fertile topsoil and store in an ecologically sensitive manner in order that it may be reused in landscaping work. Topsoil will be stored in a designated area in low level spoil heaps to reduce compaction and retain soil structure and fertility to the extent possible; spoil heaps to be covered to prevent soil erosion by wind blow and surface water runoff.
- Minimize soil erosion and surface water runoff by reducing the extent of vegetation, soil clearance and earthworks, revegetating earthworks on completion, and covering stores of sand and spoil with tarpaulin. Undertake sequenced construction method and revegetate areas immediately construction activities are completed in one area rather than undertaking earthworks on all parts of the site to minimize the area of bare ground exposed at any one time.
- Material stores will be surrounded by cut off drains/silt fences to prevent sediment laden runoff.
- Ensure surface water runoff from the construction site shall not discharge directly to surface water. Sediment control measures in the form of silt traps and sedimentation tank will be provided to treat surface run-off before disposal.
- If water from excavations is pumped it must be disposed of via a sedimentation basin, it must not be disposed of directly to surface water.
- Water sprinkling will be controlled such that no excess surface water runoff or pooling/ponding occurs.
- Dumping of construction waste including excess spoil into streams and drains is prohibited.

### **Materials and Waste Management**

- Import all materials from existing licensed sources and keep records of all materials used, and sources.
- Storage yards will be fenced using a solid fence to catch windblown material.
- Use durable, long-lasting materials that will not need to be replaced as often, thereby reducing the amount of construction waste generated over time.
- Purchase perishable construction materials e.g., paints incrementally to reduce spoilage of unused materials.
- Use building materials that have minimal packaging to avoid generation of excessive packaging waste
- **Use construction materials containing recycled content when possible and in accordance with technical standards**
- Prior to the start of works the contractor will ensure the waste management (collection, storage, transport, and disposal) system is established at the construction sites and employer provided staff accommodation for domestic solid waste and construction waste is established at the construction site
- Waste shall be managed according to the waste management hierarchy of reduce waste generated, reuse waste materials where possible, recycle materials and finally safely and soundly dispose of residual waste material. Encourage recovery of recyclable wastes that could be reused or sold to recyclers, rather than disposing of it.

- Minimize waste generation, restrict use of plastics and polyethene and use recyclable/biodegradable materials during construction to the extent possible
- Store waste in designated areas to prevent soil degradation.
- Ensure stored wastes are regularly removed from site and not allowed to build up in excess quantities.
- Separate waste containers (drums, bins, skips or bags) will be provided for different types of waste; prevent the commingling or contact between incompatible wastes and allow for inspection between containers to monitor leaks or spills
- Sensitize workers on good housekeeping and the environmentally sound storage and disposal of construction and wastes, and importantly not to leave garbage lying around, provide regular toolbox talks and arrange color marked garbage bins to collect these different wastes so they are not thrown on the floor. Develop a procedure/system to penalize through escalating fines or similar any construction workers who breach these requirements.
- Collect and segregate construction wastes including scrap metal, oil, and solid waste; ensure all workers are familiar with this segregation and arrange garbage bins to collect these wastes so they are not thrown on the floor
- Clearly identifying (label) and demarcating the waste storage area(s) on a site plan
- Store all the wastes produced in an environmentally sound manner in designated, labelled area with separate waste containers (drums, bins, skips or bags) for each distinct type of waste.
- Store solid waste in enclosed bins to contain leachate and avoid vermin.
- Store hazardous waste to prevent accidental releases to air, soil, and water resources in closed containers away from direct sunlight and rain
- Limiting access to hazardous waste storage areas to workers who have received proper training
- Secondary containment systems to be constructed using materials appropriate for the wastes being contained
- Provide adequate ventilation where volatile wastes are stored
- Conducting periodic inspections of waste storage areas and documenting the findings
- Encourage recovery of recyclable wastes that could be reused or sold to licensed recyclers, rather than disposing of it.
- Prohibit use of waste (e.g., empty cement bags and containers, plastic, wooden planks) for backfilling – only inert spoil may be used for backfilling to avoid need for off-site disposal (any excess inert spoil is to be disposed of at suitably licensed waste facilities).
- Prohibit burning of construction wastes.
- Prohibit burying or dumping of construction wastes on-site, outside the site boundary, along access roads, into streams, forest/vegetated areas, in agricultural fields, at open municipal dump sites, allowing the waste to build up in storage areas etc.
- Provide weekly toolbox talk to remind of the importance of waste disposal, prohibition of disposal on the road, in drains etc., prohibition on burning of wastes, and open defecation and urination.
- Develop a procedure/system to penalize through escalating fines or similar any construction workers who breach these requirements.
- Document all wastes removed off site (including excavated soil, solid and hazardous waste) using transfer notes, to be taken by licensed waste contractors who should reuse/recycle or dispose of the waste to suitably licensed and engineered waste management facilities according to type

- Excavated spoil that cannot be reused to a licensed disposal site as suitable for accepting inert wastes ensuring no solid or hazardous wastes are comingled with the inert excavated spoil
- Collect solid waste and dispose of it to suitably engineered and licensed sanitary waste facilities
- Ensure any hazardous waste such as oily rags or old drums disposed of in suitably licensed hazardous waste facilities
- Waste containers designated for off-site shipment to be secured and labelled with the contents and associated hazards, be properly loaded on the transport vehicles before leaving the site, and be accompanied by a shipping paper, that describes the load and its associated hazards

### ***Emergency Preparedness and Response Planning***

For spills and leaks an emergency preparedness and response plan tailored to the hazards associated with the project, should include:

- SOP for the management of containment structures, specifically the removal of any accumulated fluid, such as rainfall, to ensure that the intent of the system is not accidentally or willfully defeated
- Implementation of inspection programs to ensure containment structures are physically intact and being well managed
- Identification of locations of hazardous materials and associated activities on an emergency plan
- Documentation of availability of specific personal protective equipment and training needed to respond to an emergency
- Documentation of availability of spill response equipment sufficient to handle at least initial stages of a spill and a list of external resources for equipment and personnel, if necessary, to supplement internal resources
- Description of response activities in the event of a leak, spill, release, or other emergency including internal and external notification procedures, specific responsibilities of individuals, decision process for assessing severity of the incident and determining appropriate action, first aid and emergency medical treatment, evacuation routes, post-event activities such as clean-up and disposal, incident investigation, worker re-entry, and replenishment of used PPE and spill response equipment
- Inspecting, testing, and maintaining the emergency response equipment
- Training of workers on release prevention, including drills specific to hazardous materials stored on site

### **B. Health and Safety**

Preventive and protective measures should be introduced according to the following order of priority:

- Eliminating the hazard by removing the activity from the work process.
- Controlling the hazard at its source through use of engineering controls.
- Minimizing the hazard through design of safe work systems and administrative or institutional control measures.
- Providing appropriate personal protective equipment (PPE) in conjunction with training, use, and maintenance of the PPE.

**OHS Training:**

- Provisions to be made to provide OHS orientation training to all new workers to ensure they are apprised of the basic site rules of work at / on the site and of personal protection and preventing injury to fellow workers.
- Training should consist of basic hazard awareness, site- specific hazards, safe work practices, and emergency procedures for fire, evacuation, and natural disaster, as appropriate. Site-specific hazard or color coding in use should be thoroughly reviewed as part of orientation training.
- Specialty courses should be provided, as needed, to ensure that workers are oriented to the specific hazards of individual work assignments.
- Training to be provided to management, supervisors, workers, and occasional visitors to areas of risks and hazards.
- Workers with rescue and first-aid duties should receive dedicated training so as not to inadvertently aggravate exposures and health hazards to themselves or their co- workers.

**Good H&S Practices:**

- Always ensure good housekeeping in the premises, including on construction site, workers camps, storage areas, etc.
- Perimeter is to be kept neat and tidy, with no trip hazards on the ground e.g., open channels, materials, equipment, trash laying around.
- Do not leave hazardous conditions (e.g., unlit open excavations without means of escape) overnight
- Drums/containers/tanks that may contain substances that are hazardous because of chemical or toxicological properties, or temperature or pressure, to be labelled as to the contents and hazard, or appropriately color coded.
- Check the load of the vehicles before use, all drivers, and passengers to fasten seatbelt and comply with all transportation-related H&S laws and regulations
- Examination of all equipment and tools' quality and the presence of operational safety features before use
- Checking all electrical cords, cables, and hand power tools for frayed or exposed cords and following manufacturer recommendations for maximum permitted operating voltage of the portable hand tools
- Untrained workers will not be permitted to work with live electricity or at height.
- Observe IFC EHS Guideline on Electric Power Transmission and Distribution requirements for working with live electricity - only allow suitably trained workers that meet the requirements set out in above-referred IFC guideline to work with live electricity with strict adherence to safety standards including those listed in said guidelines; these workers must have training record of attending suitable training course on electrical safety and be provided with and wear the appropriate PPE for their role.
- Ensure proper grounding and deactivation of any live electricity during construction work or before any work near power lines and that this has been checked and certified by the H&S Officer in advance.
- Measure exposure levels to electromagnetic fields (EMF) and provide workers working in zones where EMF levels are above reference levels with personal EMF monitoring device to be attached onto their PPE.
- Require workers to observe the minimum approach distances for excavations, tools, vehicles, pruning, and other activities when working around power lines.
- Double insulating/grounding all electrical equipment used in environments that are, or may become, wet; using equipment with ground fault interrupter protected circuits
- Marking all energized electrical devices and lines with warning signs

- Labelling of service rooms housing high voltage equipment (electrical hazard) and where entry is controlled or prohibited conducting detailed identification and marking of all buried electrical wiring prior to any excavation work
- Fall prevention and protection measures should be implemented whenever a worker is exposed to the hazard of falling >2m:
- Observe IFC EHS Guideline on Electric Power Transmission and Distribution requirements for working at height; only allow suitably trained and qualified workers to work at height, these workers must have training record of attending suitable training course and be provided with and wear the appropriate PPE for their role.
- Require workers to test the structural integrity of towers prior to proceeding with the work.
- Proper use of ladders and scaffolds by trained workers
- Installation of guardrails with mid-rails and toe boards at the edge of any fall hazard area
- Use fall protection measures when working on towers, i.e., mobile elevated working platform, and all workers at height are required to wear body harness. Safety belt and lanyard travel limiting devices to prevent access to fall hazard area, or fall protection devices such as full body harnesses used in conjunction with shock absorbing lanyards or self-retracting inertial fall arrest devices attached to fixed anchor point or horizontal lifelines
- Ensure sufficient harnesses and gear are available on site for all workers, that workers are trained to use such harness and are obligated to always use the latter when working at height.
- Inclusion of rescue and/or recovery plans, and equipment to respond to workers after an arrested fall
- Implementation of safety measures while excavating to avoid collapse e.g., shoring if soil unstable
- PPE to be provided for all workers (regardless formal and informal, directly contracted or subcontracted) in accordance with Table 2.7.1. Summary of Recommended Personal Protective Equipment According to Hazard in IFC EHS Guidelines on OHS.
- Enforce disciplinary system (e.g., immediate removal from site) for non-compliance with PPE requirements.
- Eye wash station and water supply to shower to be provided during works due to risk of fuel, oil, or chemical encountering skin.
- During construction works, ensure qualified first aider and trained fire marshal is always available on-site with an appropriately equipped first aid kit and appropriate fire extinguisher and other firefighting equipment immediately available for use.
- Provide an ambulance for more serious cases to transport the patient to the hospital for treatment
- Prepare signboards reminding of health and safety measures and procedures to follow in case of accident, including key contact details (ambulance, doctor, hospital, etc.)
- Keep a log of all incidents, near-misses and accidents and include these in monthly monitoring reports
- Check health condition of workers on daily basis, for example, use of self-certification forms and temperature checks before being allowed on the construction site with more thorough monthly health checks by qualified medical professional.
- Temporary construction camps will include proper sanitation, alternative fuel to firewood, clean eating area, water supply, and secure storage of domestic solid wastes for disposal off site to suitably licensed waste management facilities.

- Pit latrines prohibited, and adequate number (about 1 toilet per 6 workers, can refer to ILO and EBRD guidance notes on workers' accommodation) of toilets and washing facility with hot and cold running water.
- Toilets to be equipped with soap and hand sanitizer.
- There should be an indication of whether toilet and washing facility is "in use" or "vacant" if not gender segregated
- Toilets should be cleaned at least twice daily to ensure they are kept in a hygienic condition.
- Prevent standing water as it may become a breeding habitat for mosquitoes etc.
- Provide workers with access to a shaded rest area on-site.
- Provide workers with a clean eating area for breaks and lunchtime.
- Provide all construction workers will an adequate supply of potable drinking water meeting national standards.
- If ground or surface water is used for drinking water, it must first be tested to confirm it meets drinking water standards and continue to be regularly tested. If drinking water standards are not met, potable water shall be imported to site.
- If workers are not local to the area use may be made of existing accommodation facilities but if a construction camp is provided it must be adequately equipped with sufficient toilets (about 1 toilet per 6 workers; proportional to the number of workers being accommodated), hand washing facilities, showers or baths, food preparation and clean eating area, beds, beddings, mosquito nets, potable drinking water, etc.
- Installation of barriers (a temporary fence ideally solid fence) at construction areas with hazard warning signs to deter people from accessing the construction site
- Require all project drivers to always abide by GoN Depart of Roads safety regulations.
- Road safety and warning signs must be posted at 500m, 100m, and immediately in advance of the works at least two weeks prior to the works commencing to inform the public of the temporary blockage.
- Access to the construction site will be under traffic controls when trucks enter and exit.
- Establishing rights-of-way, site speed limits, vehicle inspection requirements, operating rules and procedures, and control of traffic patterns or direction
- Ensuring drivers undergo medical surveillance
- Ensuring moving equipment with restricted rear visibility is outfitted with audible back-up alarms
- Construction workers including subcontractors will be given awareness raising in HIV/AIDS, other communicable diseases including sexual, exploitation, abuse, and harassment with strict penalties (e.g., immediate removal from site) for any non-compliance of workers to an agreed code of practice
- Avoid ponding of water during construction to avoid habitat creation of vector borne diseases e.g., malaria, Japanese elephantiasis, dengue.
- Working schedule to be developed to allow enough breaks and enough rest time in-between the shifts.
- No employee should be exposed to a noise level greater than 85 dB(A) for a duration of more than 8 hours per day without hearing protection. In addition, no unprotected ear should be exposed to a peak sound pressure level (instantaneous) of more than 140 dB(C).
- Use of hearing protection should be enforced actively when the equivalent sound level over 8 hours reaches 85 dB(A), the peak sound levels reach 140 dB(C), or the average maximum sound level reaches 110dB(A). Hearing

protective devices provided should be capable of reducing sound levels at the ear to at least 85 dB(A).

- Hearing protection is preferred for any period of noise exposure more than 85 dB(A) an equivalent level of protection can be obtained, but less easily managed, by limiting the duration of noise exposure. For every 3 dB(A) increase in sound levels, the allowed exposure period or duration should be reduced by 50 percent.
- Prior to the issuance of hearing protective devices as the final control mechanism, use of acoustic insulating materials, isolation of the noise source, and other engineering controls should be investigated and implemented, where feasible

Fires and or explosions resulting from ignition of flammable materials or gases can lead to loss of property as well as possible injury or fatalities to project workers. Prevention and control strategies include:

- Storing flammables away from ignition sources and oxidizing materials.
- Defining and labelling fire hazards areas to warn of special rules (e.g., prohibition in use of smoking materials, cellular phones, or other potential spark generating equipment)
- Providing specific worker training in handling of flammable materials, and in fire prevention or suppression
- Oxyacetylene burning equipment will not be permitted in any confined space.
- Burning equipment of the oxy-propane type shall be used.

### **Occupational Health and Safety Plan for Construction**

- Occupational Health and Safety Plan will aim to ensure that the workplace is safe and healthy by addressing the hazards and risks at the workplace; outlining the procedures and responsibilities for preventing, eliminating, and minimizing the effects of those hazards and risks; identifying the emergency management plans for the workplace or workplaces; and specifying how consultation, training and information are to be provided to employees at various workplaces.

### **Steps to Ensure Maximizing of Safety at Construction Site**

The contactor will be responsible for implementation of the following:

- (i) Installation of signboards and symbols in risky and hazardous areas, to inform workers to be careful.
- (ii) Ensuring that materials are all stacked, racked, blocked, interlocked, or otherwise secured to prevent sliding, falling, or collapse.
- (iii) Vehicles will be moved only along pre-assigned routes and have well-functioning horns, reverse light and buzzer, rear view mirrors, etc.
- (iv) Removing all scrap and waste material from the immediate work area as the work progresses.
- (v) Use only trained staff to construct, install, handle, and repair all electrical equipment to prevent risks of electrical shocks and electrocution.
- (vi) Install fire extinguishers and/or other fire-fighting equipment at every work site to prepare for any accidental fire hazards.
- (vii) First aid kits shall be always made available throughout the entire construction period. Arrangement shall be made to ensure medical attention for workers who have met with an accident or sudden illness at any time during the construction period.
- (viii) Fire protection: the employer shall be responsible for a fire protection and prevention throughout all phases.
- (ix) Hand and power tools: Conditions of all hand and power tools or other reciprocating, rotating, or moving parts of equipment shall be maintained by the employer in a safe condition to prevent any accidents.
- (x) Aisles and passageways shall be kept clear to provide for free and safe movement of material handling equipment and workers. Material if stored/stacked at roadside must not hinder free movement of vehicles and persons.
- (xi) The areas used for construction shall be kept in good repair to ensure safe movement of vehicle or person.

**Personnel Protective Equipment.** Risks to the health and safety of workers can be prevented by provision of Personal Protective Equipment (PPEs) to all workers. Personal protective equipment like safety gloves, helmet, mufflers etc. will be provided during the construction period and during the maintenance work. Depending on the nature of work and the risks involved, contractors must provide without any cost to the workers, the following protective equipment.

- (i) Helmet shall be provided to all workers, or visitors visiting the site, for protection of the head against impact or penetration of falling or flying objects.
- (ii) All PPE must be of good quality with mark of quality standard certification.
- (iii) Safety belt shall be provided to workers working at heights for bridge construction, etc.
- (iv) Safety boots shall be provided to all workers for protection of feet from impact or penetration of falling objects on feet.
- (v) Ear protecting/ earmuffs/plugs shall be provided to all workers in high noise zones.
- (vi) Eye and face protection equipment shall be provided to all welders to protect against sparks.
- (vii) Respiratory protection devices shall be provided to all workers during occurrence of fumes, dusts, or toxic gas/vapor.
- (viii) The supervisor must ensure that appropriate personal protective equipment is available to workers; properly worn when required and properly cleaned, inspected, maintained, and stored.
- (ix) A worker shall be responsible for using the items of personal protective equipment provided by the employer.
- (x) A worker who is required to use personal protective equipment must-
  - Use the equipment in accordance with training and instruction.
  - Inspect the equipment before use.

- Refrain from wearing protective equipment outside of the work area which if done so would constitute a hazard; and
  - Report any equipment malfunction to the supervisor or employer.
- (xi) A worker who is assigned responsibility for cleaning, maintaining, or storing personal protective equipment must do so in accordance with training and instruction provided.
- (xii) The safety and emergency procedures manual will be kept. Necessary training regarding the safety aspects of the personnel working at the project site will be provided.
- (xiii) First aid facilities will be made available, and doctors called in from nearby village/towns when necessary.

**Personal Protective Equipment for Safety of Different Body Parts**

| <b>Sr. No.</b> | <b>Body Part to be protected</b> | <b>Personal Protective Equipment</b>                                                                     |
|----------------|----------------------------------|----------------------------------------------------------------------------------------------------------|
| 1              | Head                             | Safety helmet, hard hat, Crash helmets                                                                   |
| 2              | Eye                              | Eye protectors, eye protectors for radiations, shield and helmet, zero power goggles                     |
| 3              | Ear                              | Earplug, earmuffs                                                                                        |
| 4              | Noise-Mouth                      | Du respirator, gas mask, self-contained breathing apparatus, dust masks                                  |
| 5              | Hand                             | Standard work gloves, cutting gloves, leather work gloves, heat protective gloves, anti-vibration gloves |
| 6              | Foot                             | Industrial safety boots, chemical-proof boots                                                            |
| 7              | Body                             | Standard work clothing, chemical-proof clothing, heat protective clothing, leather apron                 |
| 8              | Others                           | Safety belts, personal protective equipment for radiation protection, back support belts                 |

**Contents of First-Aid Box**

| <b>Sr. No.</b> | <b>Description</b>                            | <b>Quantity</b> |
|----------------|-----------------------------------------------|-----------------|
| 1              | First aid leaflet                             | 1 copy          |
| 2              | Sterilized finger dressing                    | 10 nos.         |
| 3              | Sterilized hand or foot dressing              | 10 nos.         |
| 4              | Sterilized body or large dressing             | 6 nos.          |
| 5              | Sterilized burns dressing - small             | 4 nos.          |
| 6              | Sterilized burns dressing - large             | 2 nos.          |
| 7              | Sterilized burns dressing – extra large       | 6 nos.          |
| 8              | Sterilized cotton wool (25 gms)               | 2 tubes         |
| 9              | Cetavolon                                     | 2 tubes         |
| 10             | Eye pads                                      | 6 nos.          |
| 11             | Adhesive plaster                              | 1 spool         |
| 12             | Assorted roller bandage                       | 6 nos.          |
| 13             | Triangular bandages                           | 6 nos.          |
| 14             | Safety pins                                   | 6 nos.          |
| 15             | Scissors, ordinary, 12.7cms, both sides sharp | 1 pair          |
| 16             | Antiseptic liquid, 150 ml, or equivalent      | 2 nos.          |
| 17             | Cotton wool for padding, 100 gms              | 2 packets       |
| 18             | Eye Ointment of sulphacetamide preparation    | 1 tube          |
| 19             | Loose woven gauze (28"x8"), compressed pack   | 1 packet        |
| 20             | Aspirin, 300 mg (10 tablets)                  | 5 strips        |
| 21             | Note Pad, with a pencil in a plastic cover    | 1 no.           |
| 22             | Adhesive dressing strips                      | 10 strips       |
| 23             | Field dressing of modified army pattern       | 3 nos.          |
| 24             | Record cards in a plastic cover               | 1 set           |
| 25             | Torch, medium size                            | 1 no.           |
| 26             | Eye wash                                      | 1 no.           |
| 27             | Wooden splints, small                         | 1 set           |
| 28             | Wooden splints, big                           | 1 set           |
| 29             | Disinfectant, Spirt, 100ml                    | 1 bottle        |

**Health Management Plan.** Nearby, full-fledged hospital facilities should be made available round the clock for attending emergency arising out of accidents, if any. All working personnel should be medically examined at least once in every six month and at the end of his/her term of employment. This is in addition to the pre-employment medical examination. Contractor will implement the following:

- (i) Medical Emergency Response Planning for Disaster Management Plan.
- (ii) Control of vectors in the project site; stagnant water to be drained off, raise awareness among the workers to combat spread of vector borne diseases, self-hygiene.
- (iii) Screening Programs for Diabetes, Hypertension, AIDS, and Occupational Diseases etc.
- (iv) Preventive Health Examinations e.g., Pre-employment, Periodic (Annual) health examinations.
- (v) Medical Surveillance Program for health impacts of hazards.
- (vi) Workers Immunization against Tetanus, Hepatitis, etc.

**Records and Documentation.** Contractor will document and keep record making them available for review. Reports prepared by the contractor shall include information on the place, date and time of the incident, name of persons involved, cause of incident, witnesses present and their statements. Based on such reports, the management can jointly identify any unsafe conditions, acts or procedures and recommend for the contractor to undertake certain mitigative actions to change any unsafe or harmful conditions.

**Accidents and Diseases Monitoring:** Establish procedures and systems for reporting and recording:

- (i) Occupational accidents and diseases
- (ii) Dangerous occurrences and incidents
- (iii) These systems should enable workers to report immediately to their immediate supervisor any situation they believe presents a danger to life or health.
- (iv) The systems and the employer should further enable and encourage workers to report to management all:
  - Occupational injuries and near misses
  - Suspected cases of occupational disease
  - Dangerous occurrences and incidents

All reported occupational accidents, occupational diseases, dangerous occurrences, and incidents together with near misses should be investigated with the assistance of a person knowledgeable/competent in occupational safety. The investigation should: Establish what happened; Determine the cause of what happened, identify measures necessary to prevent a recurrence, Distinction is made between fatal and non-fatal injuries. The two main categories are divided into three sub-categories according to time of death or duration of the incapacity to work. The total work hours during the specified reporting period should be reported to the appropriate regulatory agency.

**Compensation for Injuries and Death.** Any casualty or injury resulting from occupational activities should be compensated as per GoI regulations. Where compensation is sought by the injured party, proper procedures for documentation of the case will be followed, including a detailed report on the accident, written reports from witnesses, report of the examining doctor and his/her recommendation for treatment. Each individual contractor will be responsible for ensuring compensation for the respective workers.

**Offences.** Workers should abide by the following regulations also, which are to be supervised by the Contractor:

- (i) No gambling is to be in project site area, either construction site or camps, which may lead to conflicts
- (ii) No drugs or alcohol abuse to be tolerated in the project site area
- (iii) Workers should not be minor (below 18 years age)

Restriction on keeping any dangerous arms or equipment (licensed or not) when in the project area, except for security personals.

### **Structural Safety of Project Infrastructure**

- (i) Inclusion of buffer strips or other methods of physical separation around project sites to protect the public from major hazards associated with hazardous materials incidents or process failure, as well as nuisance issues related to noise, odors, or other emissions
- (ii) Incorporation of siting and safety engineering criteria to prevent failures due to natural risks posed by earthquakes, cyclone, cloud burst, flooding, landslides, and fire. To this end, all project structures should be designed in accordance with engineering and design criteria mandated by site-specific risks, including but not limited to seismic activity, slope stability, wind loading, and other dynamic loads
- (iii) Application of locally regulated or internationally recognized building codes to ensure structures are designed and constructed in accordance with sound architectural and engineering practice, including aspects of fire prevention and response
- (iv) Engineers and architects responsible for designing and constructing facilities, building, plants, and other structures should certify the applicability and appropriateness of the structural criteria employed.

**Fire Prevention.** Fire prevention addresses the identification of fire risks and ignition sources, and measures needed to limit fast fire and smoke development. These issues include:

- (i) Fuel load and control of combustibles
- (ii) Ignition sources
- (iii) Interior finish flame spread characteristics
- (iv) Interior finish smoke production characteristics
- (v) Human acts, and housekeeping and maintenance

**Fire Suppression and Control.** Fire suppression and control includes all automatic and manual fire protection installations, such as:

- (i) Automatic sprinkler systems
- (ii) Manual portable extinguishers
- (iii) Fire hose reels

**Emergency Response Plan:** An Emergency Response Plan is a set of scenarios-based procedures to assist staff and emergency response teams during real life emergency and training exercises. This chapter of the Fire and Life Safety Master Plan should include an assessment of local fire prevention and suppression capabilities.

**Traffic Safety:** Traffic safety should be promoted by all project personnel during displacement to and from the workplace, and during operation of project equipment on private or public roads. Prevention and control of traffic related injuries and fatalities should include the adoption of safety measures that are protective of project workers and of road users, including those who are most vulnerable to road traffic accidents. Road safety initiatives proportional to the scope and nature of project activities should include:

- (i) Adoption of best transport safety practices across all aspects of project operations with the goal of preventing traffic accidents and minimizing injuries suffered by project personnel and the public. Measures should include:
  - (ii) Emphasizing safety aspects among drivers
  - (iii) Improving driving skills and requiring licensing of drivers
  - (iv) Adopting limits for trip duration and arranging driver rosters to avoid overtiredness
  - (v) Avoiding dangerous routes and times of day to reduce the risk of accidents
  - (vi) Use of speed control devices (governors) on trucks, and remote monitoring of driver actions
  - (vii) Regular maintenance of vehicles and use of manufacturer approved parts to minimize potentially serious accidents caused by equipment malfunction or premature failure.
- (viii) The procedures for transportation of hazardous materials should include:
  - Proper labelling of containers, including the identify and quantity of the contents, hazards, and shipper contact information
  - Providing a shipping document (e.g. shipping manifest) that describes the contents of the load and its associated hazards in addition to the labelling of the containers. The shipping document should establish a chain-of-custody using multiple signed copies to show that the waste was properly shipped, transported and received by the recycling or treatment/disposal facility
  - Ensuring that the volume, nature, integrity and protection of packaging and containers used for transport are appropriate for the type and quantity of hazardous material and modes of transport involved
  - Ensuring adequate transport vehicle specifications o Training employees involved in the transportation of hazardous materials regarding proper shipping
  - procedures and emergency procedures using labelling and placarding (external signs on transport vehicles), as required
  - Providing the necessary means for emergency response on call 24 hours/day

## Appendix 3: Labor Accommodation Guideline

### Temporary Worker Accommodation

In addition to GON requirements for temporary overnight labor accommodation follow ILO Safety and Health in Construction and worker accommodation guidelines and the below points to comply with the core labor standards etc.

Day camps with temporary structures to provide protection against the weather conditions for rest and eating of food will be required at site as a rest area but these are not to be used for sleeping overnight. Adequate quantity of safe drinking water and container for their safe storage shall be provided at day camps; at least 4 liters of water per person per day to be provided for consumption during the working day at each site. If no existing toilets within 100m that can be used, temporary sanitation facilities for men and women workers shall be provided where the wastewater generated is enclosed in a container to be later taken offsite for wastewater treatment and disposal. Food provided to day camps should be cooked off site; if it is to be reheated at site fire-safety measures must be adopted with LPG cylinders or kerosene purchased from authorized vendors. After completion of the construction work the temporary structures shall be removed and the land will be restored to its earlier condition.

#### 1.1 General living facilities

##### Location

- Appropriate siting to avoid flooding or other natural hazards
- Location within a reasonable distance from the worksite to be unaffected by the worksite's noise, emissions or dust but avoiding undue amount of time travelling to work
- Safe and free transport to the worksite where remotely located
- Built with structurally sound materials, kept in good repair, clean and free from rubbish and other refuse
- After completion of the construction work the temporary structures shall be removed and the land will be restored to its earlier condition.

##### Drainage

- Adequate drainage, no waterlogging

##### Heating, air conditioning, ventilation and light

- Adequate heating, air conditioning and ventilation where appropriate
- Adequate natural light and artificial light, including emergency lighting

##### Water

- Easy access to an adequate supply of free, safe and potable water
- Constructed and covered storage tanks to prevent water from pollution or contamination
- Regular monitoring of drinking water quality

##### Wastewater and solid waste

- Adequate discharge of wastewater, sewage, food and any other waste materials

Disposal of sewage and other wastewater shall be made connected to an existing sewerage system or made through a septic tank-soak pit arrangement

- Separate enclosed (lidded) bins with proper markings in terms of recyclable or non-recyclable waste shall be provided in the labor camps and kitchen premises in sufficient numbers for collection of garbage.
- Specific containers for rubbish collection in adequate number and being regularly emptied
- Pest extermination, vector control and disinfection throughout the living facilities

#### 1.2 Rooms/dormitories facilities

- Kept in good condition, aired and cleaned at regular intervals

- Built with easily cleanable flooring materials
- Adequate furniture (such as table, chair, mirror, bedside light) for every worker
- Lockable doors and windows with mosquito screens when necessary
- Living space and space for privacy
- Adequate living space (see also International standards for spacing at migrant workers' accommodation)
- Adequate headroom, providing full and free movement, of not less than 203 cm
- Inside dimensions of a sleeping space of at least 198 cm by 80 cm
- Minimized number of workers sharing the same room/dormitory (recommended 2–8 worker)
- Mobile partitions or curtains to ensure privacy
- Gender-segregated accommodations, except in family accommodation
- Separate sleeping rooms for shifts to ensure no workers working during the day share a room with workers on night shifts
- Bed arrangements and storage facilities
- A separate bed for each worker
- Minimum space of 1 m between beds
- Minimized use of double deck bunks and no use of triple deck bunks
- Enough clear space between the lower and upper bunk of the bed where double deck bunks are in use (recommended 0.7–1.1 m)
- Reasonably comfortable bedding materials (mattress, pillow, cover and clean bed linen) for each worker
- Bedding and bedframe materials designed to deter vermin
- Individual, lockable storage facilities for each worker to secure their belongings

### 1.3 Sanitary facilities

- Sanitary and toilet facilities provided for men and women including private bathing area, showers, or baths in overnight accommodation.
- Separate housekeeping staff shall be engaged for regular cleaning of the accommodation.
- Frequent cleaning and kept in good condition
- Located within the same buildings with rooms/dormitories
- Constructed from easily cleanable materials
- Shower/bathroom flooring made of anti-slip hard washable materials
- Adequate privacy, including ceiling to floor partitions and lockable doors
- Adequate number of sanitary facilities (a minimum of one toilet, one wash basin and one tub or shower for every six persons)
- Convenient and easily accessible location
- Compliance with minimum standards of health and hygiene
- Separate sanitary facilities for men and women, except in family accommodation
- Suitable light and good ventilation to open air, independently of any other part of the accommodation
- Adequately stocked soap and hygienic paper
- Adequate supply of hot and cold fresh running water (at least 80-100 liters per capita per day)

### 1.4 Canteen, cooking and laundry facilities

- If workers cook their own meals, kitchen space is provided separately from the sleeping areas.

- No labor shall be allowed to collect fuel wood/NTFP or purchase fuel wood/NTFP from unauthorized vendors.
- LPG cylinders or kerosene purchased from authorized vendors shall be provided.
- Being built with adequate and easy to clean materials
- Being kept in clean and sanitary condition
- Common dining rooms, canteens or mess rooms, and kitchen space located away from sleeping areas
- Enough space in the canteen (1–1.5 m<sup>2</sup> per worker)
- Adequately furnished canteen (tables, benches, individual drinking cups and plates)
- Adequate facilities to maintain adequate personal hygiene (enough washbasins, clean water, materials for hygienic drying)
- Places for food preparation adequately ventilated and equipped to protect against contamination between and during food preparation
- Kitchen floor, ceiling and wall surfaces adjacent to or above food preparation and cooking areas built in non-absorbent, durable, non-toxic, easily cleanable materials
- Wall surfaces adjacent to cooking areas made of fire-resistant materials; food preparation tables equipped with a smooth, durable, non-corrosive, non-toxic, washable surface
- Adequate facilities for cleaning, disinfecting and storage of cooking utensils and equipment
- Adequate sealable containers to deposit food waste and other refuse; refuse frequently removed from the kitchen to avoid accumulation
- Implementation of the WHO “5 keys to safer food” or equivalent process in relation to food safety
- Provided food containing appropriate nutritional value and considering migrant workers' religious/cultural backgrounds
- Adequate facilities for washing and drying clothes, appropriately situated and furnished laundry facilities
- Collection of wastewater from washing areas and kitchens further disposed through existing sewerage connection or septic tank with soak away

#### Medical facilities

- Adequate number and stock of first aid kits
- Adequate number of staff/workers trained to provide first aid
- Residents are provided guidance on alcohol, drug and HIV/AIDS and other health risks
- On site medical facilities/services (where possible and depending on the medical infrastructure existing in the community)
- Separate facilities for sick workers to prevent the spread of transmissible diseases among occupants
- Appropriate and reasonable accommodations in connection with pregnancy, childbirth and nursing

#### 1.6 Leisure, social and telecommunication facilities

- Basic collective social/rest spaces and adequate recreational areas where not otherwise available in the community
- Dedicated places for religious observance
- Reasonable access to internet facilities, telephone or other modes of communications free of charge or at affordable/public prices

#### 2.1 Management and staff

- An appointed person with adequate background, competency and experience to manage the accommodations or monitor third-party service providers
- Clear contractual management responsibilities and monitoring and reporting requirements where third-party service providers are being used

- Adequate staff to implement the accommodation standards (cleaning, cooking, security, general maintenance)
- Basic health and safety training for staff, including training in nutrition and food handling for those in charge of the kitchen
- Frequent inspection and maintenance of premises and records kept

## 2.2 Fees and costs for accommodation and related services

- Accommodation free of charge where migrant workers are not free to look for their own accommodations
- Fair and transparent renting arrangements, not costing migrant workers more than a small proportion of income (when costs are charged)
- Adequate information to migrant workers about all payments made
- Clearly specifying renting arrangements and regulations in migrant workers' employment contracts
- Food and other services provided at the facilities for free or reasonably priced (this means not above the local market price)
- No in-kind payments for accommodation and related services

## 2.3 Health and safety

- Adequate health and safety management plans including electrical, mechanical, structural and food safety
- Available emergency plans on health and fire safety and other specific occurrences (earthquakes, floods, tornadoes, pandemic)
- Regular training in safety and health rules and procedures for all occupants
- Posting of safety notices and operational instructions in language migrant workers understand or visual form
- Adequate number of staff/workers trained in providing first aid
- Easy access to medical facilities and medical staff, including women doctors/nurses where appropriate Guidance on alcohol, drug and HIV/AIDS and other health risks-related activities provided to migrant workers
- Access to adequate contraception measures and mosquito nets (where relevant)

## Fire safety

- Specific and adequate fire safety plan and measures
- Training of fire wardens
- Installing, periodic testing and maintenance of fire equipment (alarms, extinguishers, etc.)
- Training for migrant workers in fire procedures and periodic drills (in a language they understand)
- Bedding not containing flammable materials
- Radiators and other heating apparatus properly placed to avoid risk of fire, and shielded where necessary to prevent discomfort to occupants
- Emergency evacuation plans are displayed at strategic areas in language understood by workers
- Clearly marked emergency exits
- Adequate means of escape provided and properly maintained

## 2.4 Security

- Security at worker's accommodation shall be ensured.
- A security plan including clear measures to protect migrant workers against theft and attack and clear provisions on the use of force
- The backgrounds of security staff checked for previous crimes or abuses
- Clear instructions for security staff not to harass, intimidate, discipline, discriminate against migrant workers or restrict the freedom of movement
- Adequate training for security staff in dealing with violence and harassment and the use of force (including gender-based violence and sexual harassment)

- Body searches only performed in exceptional circumstances by specifically trained security staff; pat down searches on women workers only performed by women security staff

#### 2.5 Migrant workers' rights, rules and regulations on migrant workers' accommodation

- Migrant workers' 24/7 access to the accommodation; security measures reasonable and not unduly restricting migrant workers' freedom of movement
- Adequate transport system to the surrounding communities
- Withholding migrant workers' documentation papers prohibited; migrant workers entitled to keep their documents in their own lockers
- Trade union representatives' access to migrant workers in the accommodation site
- Visitor access allowed in accordance with company rules for privacy or safety
- Migrant workers' religious, cultural and social backgrounds respected
- Adequate information to migrant workers about their rights and obligations (a copy of the accommodations' internal rules, procedures and sanction mechanism in a language or through a media they understand)
- Non-discriminatory, fair and reasonable house regulations
- Effective grievance mechanisms for migrant workers to articulate their grievances
- Display of contact information of consular services, company personnel and civil society organizations at the facilities

#### **Permanent Worker Accommodation (Substation Design)**

In addition to GON requirements for permanent labor accommodation follow ILO worker accommodation guidelines and the below additional points to comply with the core labor standards etc.

##### **Integrity of Structures**

- Surfaces, structures and installations should be easy to clean and maintain, and not allow for accumulation of hazardous compounds.
- Buildings should be structurally safe, provide appropriate protection against the climate, and have acceptable light and noise conditions.
- Fire resistant, noise-absorbing materials should, to the extent feasible, be used for cladding on ceilings and walls.
- Floors should be level, even, and non-skid.

##### **Severe Weather**

- Structures should be designed and constructed to withstand the expected elements for the region and have an area designated for safe refuge, if appropriate.

##### **Exit**

- Passages to emergency exits should be unobstructed at all times.
- Exits should be clearly marked to be visible in total darkness. The number and capacity of emergency exits should be sufficient for safe and orderly evacuation of the greatest number of people present at any time, and there should be a minimum of two exits from any work area.
- Facilities also should be designed and built taking into account the needs of disabled persons.

##### **Fire Precautions**

- Equipping facilities with fire detectors, alarm systems, and fire-fighting equipment. The equipment should be maintained in good working order and be readily accessible. It should be adequate for the dimensions and use of the premises, equipment installed, physical and chemical properties of substances present, and the maximum number of people present.
- Provision of manual firefighting equipment that is easily accessible and simple to use

- Fire and emergency alarm systems that are both audible and visible

### **Lavatories and Showers**

- Adequate lavatory facilities (toilets and washing areas) should be provided for the number of people expected to work/live in the facility and allowances made for segregated facilities, or for indicating whether the toilet facility is “In Use” or “Vacant”. Toilet facilities should also be provided with adequate supplies of hot and cold running water, soap, and hand drying devices.

### **Potable Water Supply**

- Adequate supplies of potable drinking water should be provided from a fountain with an upward jet or with a sanitary means of collecting the water for the purposes of drinking
- Water supplied to areas of food preparation or for the purpose of personal hygiene (washing or bathing) should meet drinking water quality standards

### **Lighting**

- Workplaces should, to the degree feasible, receive natural light and be supplemented with sufficient artificial illumination to promote workers’ safety and health, and enable safe equipment operation. Supplemental ‘task lighting’ may be required where specific visual acuity requirements should be met.
- Emergency lighting of adequate intensity should be installed and automatically activated upon failure of the principal artificial light source to ensure safe shut-down, evacuation, etc.

### **Safe Access**

- Passageways for pedestrians and vehicles within and outside buildings should be segregated and provide for easy, safe, and appropriate access
- Equipment and installations requiring servicing, inspection, and/or cleaning should have unobstructed, unrestricted, and ready access
- Hand, knee and foot railings should be installed on stairs, fixed ladders, platforms, permanent and interim floor openings, loading bays, ramps, etc.
- Openings should be sealed by gates or removable chains
- Covers should, if feasible, be installed to protect against falling items
- Measures to prevent unauthorized access to dangerous areas should be in place

### **First Aid**

- Ensure that qualified first-aid can be provided at all times.
- Appropriately equipped first-aid stations should be easily accessible throughout the place of work
- Eye-wash stations and/or emergency showers should be provided close to all workstations where immediate flushing with water is the recommended first-aid response
- Where the scale of work or the type of activity being carried out requires, dedicated and appropriately equipped first-aid room(s) should be provided. First aid stations and rooms should be equipped with gloves, gowns, and masks for protection against direct contact with blood and other body fluids
- Remote sites should have written emergency procedures in place for dealing with cases of trauma or serious illness up to the point at which patient care can be transferred to an appropriate medical facility.

### **Air Supply**

- Sufficient fresh air should be supplied for indoor and confined work spaces. Factors to be considered in ventilation design include physical activity, substances in use, and process- related emissions.
- Air distribution systems should be designed so as not to expose workers to draughts
- Mechanical ventilation systems should be maintained in good working order. Point-source exhaust systems required for maintaining a safe ambient environment should have local indicators of correct functioning.
- Re-circulation of contaminated air is not acceptable. Air inlet filters should be kept clean and free of dust and microorganisms.
- Heating, ventilation and air conditioning (HVAC) and industrial evaporative cooling systems should be equipped, maintained and operated so as to prevent growth and spreading of disease agents (e.g. *Legionella pneumophila*) or breeding of vectors (e.g. mosquitoes and flies) of public health concern.

### **Temperature**

- The temperature in work, rest room and other welfare facilities should, during service hours, be maintained at a level appropriate for the purpose of the facility.

### **OHS Training**

- Provisions should be made to provide OHS orientation training to all new employees to ensure they are apprised of the basic site rules of work at / on the site and of personal protection and preventing injury to fellow employees.
- Training should consist of basic hazard awareness, site- specific hazards, safe work practices, and emergency procedures for fire, evacuation, and natural disaster, as appropriate. Any site-specific hazard or color coding in use should be thoroughly reviewed as part of orientation training.

### **Permanent Accommodation**

- A separate bed for each worker
- Adequate headroom, providing full and free movement, of not less than 203 cm
- The minimum inside dimensions of a sleeping space should be at least 198 cm by 80 cm
- Beds should not be arranged in tiers of more than two
- Bedding materials should be reasonably comfortable
- Bedding and bedframe materials should be designed to deter vermin
- Separate accommodation of the sexes
- Adequate natural light during the day- time and adequate artificial light
- A reading lamp for each bed
- Adequate ventilation to ensure sufficient movement of air in all conditions of weather and climate
- heating where appropriate
- Adequate supply of safe potable water
- Adequate sanitary facilities (see below)
- Adequate drainage
- Adequate furniture for each worker to secure his or her belongings, such as a ventilated clothes locker which can be locked by the occupant to ensure privacy
- Common dining rooms, canteens or mess rooms, located away from the sleeping areas
- Appropriately situated and furnished laundry facilities
- Reasonable access to telephone or other modes of communications, with any charges for the use of these services being reasonable in amount
- Rest and recreation rooms and health facilities, where not otherwise available in the community
- In workers' sleeping rooms the floor area should not be less than 7.5 square metres in rooms accommodating two persons; 11.5 square metres in rooms accommodating three

persons; or 14.5 square metres in rooms accommodating four persons. If a room accommodates more than four persons, the floor area should be at least 3.6 square metres per person. Rooms should indicate the permitted number of occupants.

- As far as practicable, sleeping rooms should be arranged so that shifts are separated and that no workers working during the day share a room with workers on night shifts.

### **Sanitation Facilities**

- Adequate sanitary facilities should include a minimum of one toilet, one wash basin and one tub or shower for every six persons. They should be provided at a convenient location which prevents nuisances.
- Sanitary facilities provided should meet minimum standards of health and hygiene. They should also provide reasonable standards of comfort, including hot and cold fresh running water.
- There should be separate sanitary facilities provided for men and for women.
- Sanitary facilities should have ventilation to the open air, independently of any other part of the accommodation.
- Soap and hygienic paper should be adequately stocked.
- Measures should be taken to prevent the spread of diseases. Separate facilities should be provided for sick workers to prevent the spread of transmissible diseases among the occupants.
- Fire safety measures should be taken, including installing and maintaining fire equipment (alarms, extinguishers, etc.).
- Workers should be trained in fire procedures.
- Bedding should not contain flammable materials.
- Radiators and other heating apparatus should be placed so as to avoid risk of fire, and shielded where necessary to prevent discomfort to occupants.

### **Inspection of premises**

- Premises should be inspected frequently to ensure that the accommodation is clean, decently habitable and maintained in a good state of repair. The results of each such inspection should be recorded and be available for review.

### **Vacating the premises upon termination of employment**

- When a worker's contract of employment is terminated, the worker should be entitled to a reasonable period of time to vacate the premises, in accordance with national law and custom.

### **Water Conservation**

- Regularly maintain plumbing, and identify and repair leaks
- Shut off water to unused areas
- Install self-closing taps, automatic shut-off valves, spray nozzles, pressure reducing valves, and water conserving fixtures (e.g. low flow shower heads, faucets, toilets, urinals; and spring loaded or censored faucets)
- Operate dishwashers and laundries on full loads, and only when needed
- Install water-saving equipment in lavatories, such as low- flow toilets

## Appendix 4: National and International Environmental Quality Standards and Guidelines

### NATIONAL ENVIRONMENTAL QUALITY STANDARDS

#### AIR QUALITY STANDARDS

##### National Air Quality Standards

| Parameters                   | Averaging Time        | Ambient Concentration (maximum) ug/m3 | Test Methods                                                      |
|------------------------------|-----------------------|---------------------------------------|-------------------------------------------------------------------|
| Total Suspended Particulates | Annual                | -                                     |                                                                   |
|                              | 24-hours <sup>a</sup> | 230                                   | High Volume Sampling and Gravimetric Analysis                     |
| PM2.5                        | 24-hours <sup>a</sup> | 40                                    | PM2.5 sampling gravimetric analysis                               |
| PM10                         | 24-hours <sup>a</sup> | 120                                   | High Volume Sampling Gravimetric Analysis, TOEM, Beta Attenuation |
| Sulphur Dioxide              | Annual <sup>b</sup>   | 50                                    | Ultraviolet Fluorescence, west and Gaeke Method                   |
|                              | 24-hours <sup>a</sup> | 70                                    | Same as Annual                                                    |
| Nitrogen Dioxide             | Annual                | 40                                    | Chemiluminisence                                                  |
|                              | 24-hours <sup>a</sup> | 80                                    | Same as Annual                                                    |
| Carbon Monoxide              | 8 hours <sup>a</sup>  | 10,000                                | Non Dispersive Infrared Spectrophotometer (NDIR)                  |
| Lead                         | Annual <sup>b</sup>   | 0.5                                   | High Volume Sampling, followed by Atomic absorption spectrometry  |
| Benzene                      | Annual <sup>b</sup>   | 5                                     | Gas Chromatographic Technique                                     |
| Ozone                        | 8 hours <sup>a</sup>  | 157                                   | UV spectrophotometer                                              |

Notes:

- <sup>a</sup> 24 hourly values shall be met 95% of the time in a year. 18 days per calendar year the standard may be exceeded but not on two consecutive days
- <sup>b</sup> In any specified place twice in one week continuously for 24 hours and with the weekly data taken for a minimum of 104 times; yearly average is considered.

##### Operational Diesel Generator Emission Standards<sup>14</sup>

| Category (KW) | CO   | HC+NOx | PM   |
|---------------|------|--------|------|
| KW<8          | 8    | 7.5    | 0.8  |
| 8≤KW<         | 6.6  | 7.5    | 0.8  |
| 19≤KW<        | 5.50 | 7.50   | 0.60 |
| 37≤KW<        | 5.00 | 4.70   | 0.40 |
| 75≤KW<        | 5.00 | 4.00   | 0.30 |
| 130≤KW<       | 3.5  | 4      | 0.2  |

<sup>14</sup> Source: Emission Standard for Deisel Generator 2000

### Imported Diesel Generator Emission Standards

| Category (kW) | CO  | HC+NOx | PM  |
|---------------|-----|--------|-----|
| kW<8          | 8   | 7.5    | 0.8 |
| 8<19          | 6.6 | 7.5    | 0.8 |
| 19<37         | 5.5 | 7.5    | 0.6 |
| 37<75         | 5   | 4.7    | 0.4 |
| 75<130        | 5   | 4      | 0.3 |
| 130<560       | 3.5 | 4      | 0.2 |

### Light and Over 2.5 Ton Commercial Vehicle Emission Standards

| Limit Values, Grams per Kilometer |            |            |             |
|-----------------------------------|------------|------------|-------------|
| Type of Vehicle                   | Mass of CO | Mass of HC | Mass of NOx |
| L CV (RM=<1305 Kg)                | 2.3        | 0.2        | 0.15        |
| L CV (1305>RM< or =1760 Kg)       | 4.17       | 0.25       | 0.18        |
| L CV (RM > 1760 Kg)               | 5.22       | 0.29       | 0.21        |

## NOISE STANDARDS

### Noise Standards

| Area                   | Day       | Night     | Remarks a                                                                              |
|------------------------|-----------|-----------|----------------------------------------------------------------------------------------|
| Industrial             | 75        | <b>70</b> | Passenger car at 65 miles per hour at 25 feet registers 77 dB                          |
| Commercial             | <b>65</b> | <b>55</b> | 50 dB(A) is typical of conversation in a restaurant or office                          |
| Urban Residential      | 55        | 50        | 50 dB(A) is typical of conversation at home, large electrical transformers at 100 feet |
| Rural Residential Area | <b>45</b> | <b>40</b> |                                                                                        |
| Mixed Residential Area | 63        | 55        |                                                                                        |
| Peaceful Area          | <b>50</b> | <b>40</b> |                                                                                        |
| Water Pump             |           |           | Max: 65 dB                                                                             |
| Diesel Generator       |           |           | Max: 90 dB                                                                             |
| Entertainment Means    |           |           | Max: 70 dB                                                                             |

Note a: <http://www.industrialnoisecontrol.com/comparative-noise-examples.htm>

## NATIONAL WATER QUALITY STANDARDS

### Generic Standard: Tolerance Limit for Industrial (Wastewater) Effluents Discharged into Inland Surface Waters and Public Sewers

| S<br>N | Parameters                                                   | Industrial waste into<br>Inland Surface<br>Waters | Wastewater into inland<br>Surface Waters from<br>CWTP* | Industrial Effluents<br>into Public<br>Sewers* |
|--------|--------------------------------------------------------------|---------------------------------------------------|--------------------------------------------------------|------------------------------------------------|
| 1      | TSS, mg/l                                                    | 30-200                                            | 50                                                     | 600                                            |
| 2      | Particle size of TSS                                         | Shall pass 850-micron<br>Sieve                    | Shall pass 850-micron<br>Sieve                         |                                                |
| 3      | pH Value                                                     | 5.5 to 9.0                                        | 5.5 to 9.0                                             | 5.5 to 9.0                                     |
| 4      | Temperature °C <sup>1</sup>                                  | <40                                               | <40                                                    | 45                                             |
| 5      | TDS, mg/L, max                                               |                                                   |                                                        | 2100                                           |
| 6      | Color and Odor                                               |                                                   |                                                        |                                                |
| 7      | BOD for 5 days at<br>20 degree C, mg/L<br>Max                | 30-100                                            | 50                                                     | 400                                            |
| 8      | Oils and grease,<br>mg/L, Max, Max                           | 10                                                | 10                                                     | 50                                             |
| 9      | Phenolic<br>compounds, mg/                                   | m1                                                | 1                                                      | 10                                             |
| 10     | Cyanides (as CN),<br>mg/L, Max                               | 0.2                                               | 0.2                                                    | 2                                              |
| 11     | Sulfides (as S),<br>mg/L, Max                                | 2                                                 | 2                                                      | 2                                              |
|        | Sulphates (SO <sub>4</sub> ),<br>mg/L, Max                   |                                                   |                                                        | 500                                            |
| 12     | Radioactive<br>materials:<br>a. Alpha emitters,<br>c/ml, Max | 10 <sup>-7</sup>                                  | 10 <sup>-7</sup>                                       |                                                |
|        | b. Beta emitters,<br>c/ml, Max                               | 10 <sup>-8</sup>                                  | 10 <sup>-8</sup>                                       |                                                |
| 13     | Insecticides                                                 | Absent                                            | Absent                                                 | Absent                                         |
| 14     | Total residual<br>chlorine, mg/L                             | 1                                                 | 1                                                      | 1000 as chlorides                              |
| 15     | Fluorides (as F),<br>mg/L, Max                               | 2                                                 | 2                                                      | 10                                             |
| 16     | Arsenic (as AS),<br>mg/L, Max                                | 0.2                                               | 0.2                                                    | 1                                              |
| 17     | Cadmium (as, Cd),<br>mg/L, Max                               | 2                                                 | 2                                                      | 2                                              |
| 18     | Hexavalent<br>chromium (as Cr),<br>mg/L, Max                 | 0.1                                               | 0.1                                                    | 2                                              |
| 19     | Copper (as Cu),<br>mg/L, Max                                 | 3                                                 | 3                                                      | 3                                              |
| 20     | Lead (as Pb), mg/L,<br>Max                                   | 0.1                                               | 0.1                                                    | 0.1                                            |
| 21     | Mercury (as Hg),<br>mg/L, Max                                | 0.01                                              | 0.01                                                   | 0.01                                           |
| 22     | Nickel (as Ni), mg/L,<br>Max                                 | 3                                                 | 3                                                      | 3                                              |
| 23     | Selenium (as Se),<br>mg/L, Max                               | 0.05                                              | 0.05                                                   | 0.05                                           |
| 24     | Zinc (as Zn), mg/L,<br>Max                                   | 5                                                 | 5                                                      | 5                                              |
| 25     | Sodium, %, max                                               |                                                   |                                                        |                                                |

| S<br>N | Parameters                                        | Industrial waste into<br>Inland Surface<br>Waters | Wastewater into inland<br>Surface Waters from<br>CWTP* | Industrial Effluents<br>into Public<br>Sewers* |
|--------|---------------------------------------------------|---------------------------------------------------|--------------------------------------------------------|------------------------------------------------|
| 26     | Ammoniacal<br>nitrogen, mg/L, Max                 | 50                                                | 50                                                     | 50                                             |
| 27     | COD, mg/L, Max                                    | 250                                               | 250                                                    | 1000                                           |
| 28     | Silver, mg/L, Max                                 | 0.1                                               | 0.1                                                    | 0.1                                            |
| 29     | Mineral Oils, mg/L,<br>Max                        |                                                   |                                                        | 10                                             |
| 30     | Inhibition of<br>nitrification test at<br>200ml/l |                                                   |                                                        | <50%                                           |

Source: MOEN, 2010.

Notes: CWTP= Combined Waste Water Treatment Plant; Under enforcement since BS 2058/1/17 (30 April 2001); \*Under enforcement since BS 2060/3/9 (23 June 2003); <sup>1</sup> Shall not exceed 40°C in any section within 15 m downstream from the effluent outlet.

### National Drinking Water Quality Standards

| Group                                       | National Drinking Water Quality Standards, 2022 |           |                           | Remarks                                  |
|---------------------------------------------|-------------------------------------------------|-----------|---------------------------|------------------------------------------|
|                                             | Parameter                                       | Unit      | Max. Concentration Limits |                                          |
| Compulsory Parameters                       |                                                 |           |                           |                                          |
| Physical Parameters                         | Turbidity                                       | NTU       | 5                         | NHBGV                                    |
|                                             | pH                                              |           | 6.5 – 8.5                 | NHBGV                                    |
|                                             | Color                                           | TCU       | 5                         | NHBGV                                    |
|                                             | Taste and Odor                                  |           | Should not be offensive   | NHBGV                                    |
|                                             | Electrical Conductivity                         | µS/cm     | 1500                      | NHBGV                                    |
| Chemical Parameters                         | Iron                                            | mg/l      | 0.3 (3)                   | NHBGV                                    |
|                                             | Manganese                                       | mg/l      | 0.2                       | NHBGV                                    |
|                                             | Arsenic                                         | mg/l      | 0.05                      | NHBGV                                    |
|                                             | Fluoride                                        | mg/l      | 0.5-1.5 (min-max)         | HBGV                                     |
|                                             | Ammonia                                         | mg/l      | 1.5                       | NHBGV                                    |
|                                             | Chloride                                        | mg/l      | 250                       | NHBGV                                    |
|                                             | Sulphate                                        | mg/l      | 250                       | NHBGV                                    |
|                                             | Nitrate                                         | mg/l      | 50                        | NHBGV                                    |
|                                             | Copper                                          | mg/l      | 1                         | NHBGV                                    |
|                                             | Zinc                                            | mg/l      | 3                         | NHBGV                                    |
|                                             | Aluminnium                                      | mg/l      | 0.2                       | NHBGV                                    |
|                                             | Total Hardness                                  | mg/l      | 500                       | NHBGV                                    |
|                                             | Residual Chlorine                               | mg/l      | 0.1 - 0.5                 | HBGV (for system with chlorination only) |
| Microbial Parameter                         | E-coli                                          | CFU/100ml | 0                         | HBGV                                     |
| Further testing based on risk and relevance |                                                 |           |                           |                                          |
| Physical Parameter                          | Total Dissolved Solids                          | mg/l      | 1,000                     | NHBGV                                    |
| Chemical Parameter                          | Calcium                                         | mg/l      | 200                       | NHBGV                                    |
|                                             | Lead                                            | mg/l      | 0.01                      | HBGV                                     |



*[Signature]*

| Group               | National Drinking Water Quality Standards, 2022 |           |                           | Remarks |
|---------------------|-------------------------------------------------|-----------|---------------------------|---------|
|                     | Parameter                                       | Unit      | Max. Concentration Limits |         |
|                     | Cadmium                                         | mg/l      | 0.003                     | HBGV    |
|                     | Chromium                                        | mg/l      | 0.05                      | HBGV    |
|                     | Cyanide                                         | mg/l      | 0.07                      | HBGV    |
|                     | Mercury                                         | mg/l      | 0.001                     | HBGV    |
|                     | Nitrites                                        | mg/l      | 3                         | HBGV    |
| Microbial Parameter | Total Coliform                                  | CFU/100ml | 0 (95% samples)           | HBGV    |

### Surface Water Quality (Aquatic Ecosystems)

|     | Parameter name                          | Target Water Quality Range                                                                                                                                              | Chronic Effect Value | Acute Effect Value |
|-----|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|
| 1.  | Aluminium (mg/l)                        | At pH <6.5: 5<br>At pH >6.5:10                                                                                                                                          | 10<br>20             | 100<br>150         |
| 2.  | Ammonia (µg/L)                          | < 7                                                                                                                                                                     | < 15                 | < 100              |
| 3.  | Arsenic (µg/L)                          | < 10                                                                                                                                                                    | < 20                 | < 130              |
| 4.  | Atrazine (µg/L)                         | < 10                                                                                                                                                                    | < 19                 | < 100              |
| 5.  | Cadmium                                 |                                                                                                                                                                         |                      |                    |
|     | Soft water (60 mg/l CaCO <sub>3</sub> ) | < 0.15                                                                                                                                                                  | 0.3                  | 3                  |
|     | Medium water(60 – 119 mg/l)             | < 0.25                                                                                                                                                                  | 0.5                  | 6                  |
|     | Hard water (120 – 180 mg/l)             | < 0.35                                                                                                                                                                  | 0.7                  | 10                 |
|     | Very Hard (> 180 mg/l)                  | < 0.40                                                                                                                                                                  | 0.8                  | 13                 |
| 6.  | Chlorine (Residual) µg/L                | < 0.2                                                                                                                                                                   | 0.35                 | 5                  |
| 7.  | Chromium (VI) µg/L                      | 7                                                                                                                                                                       | 10                   | 200                |
| 8.  | Chromium (III) µg/L                     | < 12                                                                                                                                                                    | 24                   | 340                |
| 9.  | Copper µg/L                             |                                                                                                                                                                         |                      |                    |
|     | Soft water (60 mg/l CaCO <sub>3</sub> ) | < 0.3                                                                                                                                                                   | 0.53                 | 1.6                |
|     | Medium water(60 – 119 mg/l)             | < 0.8                                                                                                                                                                   | 1.5                  | 4.6                |
|     | Hard water (120 – 180 mg/l)             | < 1.2                                                                                                                                                                   | 2.4                  | 7.5                |
|     | Very Hard (> 180 mg/l)                  | < 1.40                                                                                                                                                                  | 2.8                  | 12                 |
| 10. | Cyanide µg/L                            | 1                                                                                                                                                                       | 4                    | 110                |
| 11. | Dissolved Oxygen (% saturation)         | 80 – 120                                                                                                                                                                | > 60                 | > 40               |
| 12. | Endosulphan (µg/L)                      | < 0.01                                                                                                                                                                  | 0.02                 | 0.2                |
| 13. | Fluoride (µg/L)                         | < 750                                                                                                                                                                   | 1500                 | 2540               |
| 14. | Iron                                    | The iron concentration should not be allowed to vary by more than 10% of the background dissolved iron concentration for a particular site or case, at a specific time. |                      |                    |
| 15. | Lead µg/L                               |                                                                                                                                                                         |                      |                    |
|     | Soft water (60 mg/l CaCO <sub>3</sub> ) | < 0.2                                                                                                                                                                   | 0.5                  | 4                  |



*Signature*

|     | Parameter name                                | Target Water Quality Range                                                                                                                                                                                                                                                                                                                                                                                                                           | Chronic Effect Value | Acute Effect Value |
|-----|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------|
|     | Medium water(60 – 119 mg/l)                   | < 0.5                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1.0                  | 7                  |
|     | Hard water (120 – 180 mg/l)                   | < 1.0                                                                                                                                                                                                                                                                                                                                                                                                                                                | 2.0                  | 13                 |
|     | Very Hard (> 180 mg/l)                        | < 1.2                                                                                                                                                                                                                                                                                                                                                                                                                                                | 2.4                  | 16                 |
| 16. | Manganese (µg/l)                              | < 180                                                                                                                                                                                                                                                                                                                                                                                                                                                | 370                  | 1300               |
| 17. | Mercury (µg/l)                                | < 0.04                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.08                 | 1.7                |
| 18. | Nitrogen (inorganic)                          | Inorganic nitrogen concentrations should not be changed by more than 15% from that of the water body under local unimpacted conditions at any time of the year;<br>The trophic status of the water body should not increase above its present level, though a decrease in trophic status is permissible;<br>The amplitude and frequency of natural cycles in inorganic nitrogen concentrations should not be changed.                                |                      |                    |
| 19. | pH                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                      |                    |
|     | All aquatic ecosystems                        | pH values should not be allowed to vary from the range of the background pH values for a specific site and time of day, by > 0.5 of a pH unit, or by > 5%, and should be assessed by whichever estimate is more conservative.                                                                                                                                                                                                                        |                      |                    |
| 20. | Phenols (µg/l)                                | <30                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 60                   | 500                |
| 21. | Phosphorus (inorganic)                        | All surface waters Inorganic phosphorus concentrations should not be changed by > 15 % from that of the water body under local, unimpacted conditions at any time of the year;<br>The trophic status of the water body should not increase above its present level, though a decrease in trophic status is permissible (see Effects);<br>The amplitude and frequency of natural cycles in inorganic phosphorus concentrations should not be changed. |                      |                    |
| 22. | Selenium (µg/l)                               | < 2                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 5                    | 30                 |
| 23. | Temperature<br>(All aquatic ecosystems)       | Water temperature should not be allowed to vary from the background average daily water temperature considered to be normal for that specific site and time of day, by > 2°C, or by > 10%, whichever estimate is the more conservative.                                                                                                                                                                                                              |                      |                    |
| 24. | Total Dissolved Solids<br>(All inland waters) | -TDS concentrations should not be changed by > 15% from the normal cycles of the water body under un impacted conditions at any time of the year;<br>-The amplitude and frequency of natural cycles in TDS concentrations should not be changed.                                                                                                                                                                                                     |                      |                    |
| 25. | Total Suspended Solids<br>(All inland waters) | Any increase in TSS concentrations must be limited to < 10% of the background TSS concentrations at a specific site and time.                                                                                                                                                                                                                                                                                                                        |                      |                    |
| 26. | Zinc (µg/l)                                   | < 2                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3.6                  | 36                 |

Source: Department of Irrigation, Ground Water Project (Nepal Gazette (Number 10, 16 June 2008))

## ELECTRICAL SAFETY (ELECTRICITY RULES, 2050 (1993))

### CHAPTER – 5<sup>15</sup>

#### SAFETY MEASURES REGARDING ELECTRIC DEVICES

##### 48. Minimum Distance from Ground to the Electric Wire:

<sup>15</sup> <https://lawcommission.gov.np/en/?p=5065>



– (1) **Distance between the electric wire of different volts of the distribution and transmission system and the ground shall not be less than as prescribed in Schedule-12.**

(2) In case where electric line is to be installed by the side of the road or along it, it shall be done by adopting appropriate technological measures.

(3) If it is necessary to install electric line of more than 33,000 volts, it shall have to be done by adding 0.305 meter for each 33,000 volts on the distance as prescribed for 33,000 volts in Schedule-12.

49. Regarding the Installation of Electric Line Across the Road:-

**While installing electric line of more than 11,000 volt across the road in a densely populated area, the double insulator system shall have to be used.**

50. Distance to be Maintained on either side of the Electric Line:-

**(1) While installing electric line of distribution and transmission system, it shall not be installed in a distance lower than the distance as prescribed in Schedule- 13 from the house or tree.**

(2) If it is necessary to install electric line of more than 33,000 volt, it shall have to be done by adding 0.305 meter for each 33,000 volts on the distance as prescribed for 33,000 volts in Schedule-13.

51. Distance to be Maintained in between the Poles:-

**While determining the distance in between the electric poles, it shall be maintained with taking consideration upon last tensile strength factor of safety and distance between ground and wire.**

52. No Electric Lines should be carried out from above a House:-

**No electric lines of any kind shall be carried out from above a house. Provided that the lines of up to 400/230 volt may be carried out from above a garage, cottage (Tahara), or fence and such electric lines shall be installed at a height which shall not be less than three meter from the highest point of such garage, cottage or fence.**

53. In Relation to Installation of the Lines of Different voltages in a Single Pole:-

(1) While installing electric lines of different voltages on a single pole, the line of higher voltages shall be installed above and the line of low voltage below.

(2) While installing lines in a manner as mentioned in sub-rule (1), care has to be taken that no leakage or danger of any kind or charge shall exist from high voltage line to low voltage line.

(3) It is necessary that a distance required from the technical point of view should be maintained between the lines of high voltage and low voltage.

54. In Relation to electric Lines to be Installed around Airport:-

While installing electric lines around the airport, it shall be done according to a decision arrived at by the discussion with the chief of airport concerned.

55. In Relation to Installation of Electric Lines and Telephone Lines:-

While installing electric line near to the telephone lines or vice versa, the licensee and the concerned office of telecommunication shall hold discussions between them and it shall be installed in such a way that no obstacle or charge shall be made to the telephone line from the technical point of view.

56. Safety from Lightning:-

**The licensee, shall, for the purpose of safety from any harm from lightning or to ensure non-fluctuations of electric energy, provide protection equipment against lightning or any appropriate device and a system for earthing of lightning from those devices shall also be provided.**

57. Change-over-switch to be Maintained:-

Each person, who install a standby generating set for standby use, shall, in consultation with the licensee in that area, have to install a change-over-switch.

58. Earthing to be Done:-

(1) All kinds of metallic supports under high voltage system shall be permanently and effectively earthen by using perpetual earth wire.

**(2) Insulators shall have to be installed at not less than three meters from the ground in the stay-wires used in supports of transmission and distribution system.**

59. Cutout to be Installed:-

(1) The licensee shall have to install cutout or circuit breaker on the energy meter with seal for the purpose of safety and load limit of the energy meter installed in the house or premises of the consumer.

(2) The consumer shall have to install an isolating switch nearby the energy meter.

60. Earthing of Electric Devices to be used at the places of the Consumer:-

(1) If electric appliances like water-heater, air-conditioner are installed in the house of the consumer, provision of earthing shall have to be made for such appliances by supplying electricity through separate appropriate electric circuit.

(2) If electric appliances of different metals is to be used in the house or premises of the consumer, three-pin plug socket shall have to be installed and such plug socket shall have to be connected with the earthing system.

(3) The earthing system installed in the house or premises of the consumer shall have to be in accordance with the technically proper system.

61. Safety of Internal Wiring:-

Wiring method and the electric devices installed for the safety of internal wiring of the consumer's house shall have to be in accordance with the prevailing technical standard.

62. Insulated Wire to be Used:-

Insulated wire shall have to be used when joining electric line to the consumer's house.

63. Electric Line to be Provided through Pole:-

(1) While installing a electric line to the consumer's house, it shall be done only through pole.

(2) Notwithstanding anything written in sub-rule (1), while installing electric line to the consumer's house, it shall be done only after making provision of safety in accordance with the prevailing technical standard.

64. Danger of Leakage at 230/400 Volt:-

The insulation resistance of electric system of 230/400 volts and wiring shall be at least 5 megaohm.

65. Danger of Leakage at High Voltage:-

(1) The insulation resistance of 3,300 volt electric system shall be at least 20 megaohm.

(2) While calculating the insulation resistance of more than 3,300 volt electric system, it shall be done by adding 1 megaohm for each 1,000 volt on 20 megaohm.

(3) The operation of electric system without the insulation resistance as mentioned in sub-rule (1) and (2) shall not be allowed.

66. Utilization of House and Land around the construction Site Relating to Production, Transmission and Distribution of Electricity may be Prohibited:-

**(1) If any construction work has been carried on relating to production, transmission and distribution of electricity for the purpose of Sub-section (3) of Section 33 of the Act, Government of Nepal may, by publishing a notification in the Nepal Gazette from time to time, prohibit in the utilization of the house and land at the place of construction or at the place falling within the specified distance around the construction site for any specified purpose.**

**(2) No one should plant tree or construct house underneath the electric line installed for the purpose of transmission or distribution of electricity or on either side of such line within the distance as prescribed in Schedule-12 and 13.**

67. Standard of Electrical Devices and Method of Use:-

The licensee, shall have to abide by the following matters from the point of view of standard and safety of the electrical devices to be used in the works of production, transmission and distribution of the electricity:-

(a) Materials and devices of high standards should be used,

(b) when bringing into operation the new plant or after repairing the old one, it should be operated after conducting all tests from the technical point of view and be proved proper,

(c) The electric wires to be used for any purpose should be of adequate capacity required for



that work,

(d) While joining the electric wires, it should be joined in accordance with the recognized technical standard in such a way that a danger might not arise,

(e) The joint boxes of underground wire, metallic conduct joint and joint of metallic sheets of the wire shall have to be installed on such places that those joints could be easily accessible for inspection.

(f) Fuses, circuit breaker or any appropriate device shall have to be installed in such a way that if more current than the specified current flow in the electric circuit or sub-circuit, they might resist the flow of current and there would not arise any danger. These devices, while in operation, should be such that extra heat would not be produced, non-sparking and would of no danger at the time of changing.

(g) Single phase switch is not allowed to be installed in the neutral wire except on live wire.



### Right of Way (ROW) and Safety Clearances as per NEA Electricity Rules

| Parameter            | 33 kV line                                                                                                                                                                                                                                                                                          | 66 kV Line              | 132 kV Line             | 220 kV Line               |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-------------------------|---------------------------|
| Right of Way (ROW)   | 7m<br>(3.5m either side)                                                                                                                                                                                                                                                                            | 12m<br>(6m either side) | 18m<br>(9m either side) | 30m<br>(15 m either side) |
| Ground Clearances    | Minimum 6.1m at the maximum sag condition. <ul style="list-style-type: none"> <li>Road - 7m</li> <li>Power cable with voltage - 3.5m</li> <li>Communication line crossing - 3.5m</li> <li>Residential area - 7m</li> <li>Power line above/ below - 3.5m</li> <li>Phase to phase - 3.75 m</li> </ul> |                         |                         |                           |
| Horizontal Clearance | Minimum distance from a tree or a house. <ul style="list-style-type: none"> <li>For 230/400 to 11,000 V - 1.25 m</li> <li>For 11,000 to 33,000 V - 2 m</li> <li>For &gt;more than 33,000 V - add 0.305m for each 33,000V on the above distance</li> </ul>                                           |                         |                         |                           |

Source: Nepal Electricity Rules, 2050.

### SCHEDULE- 12 (ELECTRICITY RULES, 2050 (1993)) (Relating to Rule 48)

| Distance which ought to be from wire to the ground |                                    |                                 |                                 |                         |
|----------------------------------------------------|------------------------------------|---------------------------------|---------------------------------|-------------------------|
| S. No.                                             | Standard of voltage of electricity | While crossing the road (meter) | On the side of the road (meter) | In other places (meter) |
| 1.                                                 | In between 230/400 and 11,000      | 5.8                             | 5.5                             | 4.6                     |
| 2.                                                 | In between 11,000 and 33,000       | 6.1                             | 5.8                             | 5.2                     |

### SCHEDULE -13 (ELECTRICITY RULES, 2050 (1993)) (Relating to Rule 50)

#### MINIMUM DISTANCE WHICH OUGHT TO BE FROM THE WIRE TO THE HOUSE OR TREE

| S. No. | Standard of Voltage of Electricity | Minimum Distance to be from house or tree |
|--------|------------------------------------|-------------------------------------------|
| 1.     | Standard 230/400 to 11,000         | 1.25 meter                                |
| 2.     | From 11,000 to 33,000              | 2.00 meter                                |

Note:- While determining the minimum distance as above, maximum deflection of wire arising due to air pressure shall also have to be considered.

**SCHEDULE- 14 (ELECTRICITY RULES, 2050 (1993))**  
(Relating to Rule 74)

**FORMAT OF THE INFORMATION OF ACCIDENT CAUSED DUE TO ELECTRIC  
CURRENT**

1. Time and date of accident:
2. Place, district and zone of accident
3. Electricity supply voltage and system
4. Name of the person killed or injured due to accident (if animal is affected, mention it):
5. Name of the licensee of the area of accident:
6. Occupation of the person sustaining accident (work relating to electricity or other work) to be mentioned clearly:
7. (a) If accident was occurred due to work relating to electricity, particulars of the same:  
(b) If accident was occurred due to other work, how it occurred, particulars of the same:
8. If accident was occurred due to work relating to electricity, the name and designation of the person on whose order the victim was working and the statement of the person giving order:
9. Detailed description of accident:-
10. Description of the work done after accident:
11. Details of the measures take or to be taken by the licensee in order to remove the possibility of such accident in future:

**Licensee's**

Signature:-

Name:-

Designation:-

on :-

Date:-



*[Handwritten signature]*

## INTERNATIONAL (WB/IFC-EHS GUIDELINE) ENVIRONMENTAL QUALITY STANDARDS<sup>16</sup>

### AIR QUALITY

#### WHO Ambient Air Quality Guidelines of 2021 in Comparison to 2005 Guidelines

| Pollutant                              | Averaging time | WHO 2021 air quality guideline | WHO 2005 air quality guideline | Change           |
|----------------------------------------|----------------|--------------------------------|--------------------------------|------------------|
| SO <sub>2</sub> (µg/m <sup>3</sup> )   | 24-hour        | <b>40</b>                      | 20                             | +100%            |
|                                        | 10-minute      | <b>500</b>                     | 500                            | Unchanged        |
| NO <sub>2</sub> (µg/m <sup>3</sup> )   | Annual         | <b>10</b>                      | 40                             | -75%             |
|                                        | 24-hour        | <b>25</b>                      | N/A                            | Newly introduced |
|                                        | 1-hour         | <b>200</b>                     | 200                            | Unchanged        |
| PM <sub>10</sub> (µg/m <sup>3</sup> )  | Annual         | <b>15</b>                      | 20                             | -25%             |
|                                        | 24-hour        | <b>45</b>                      | 50                             | -10%             |
| PM <sub>2.5</sub> (µg/m <sup>3</sup> ) | Annual         | <b>5</b>                       | 10                             | -50%             |
|                                        | 24-hour        | <b>15</b>                      | 25                             | -40%             |
| O <sub>3</sub> (µg/m <sup>3</sup> )    | Peak season    | <b>60</b>                      | N/A                            | Newly introduced |
|                                        | 8-hour         | <b>100</b>                     | 100                            | Unchanged        |
| CO (mg/m <sup>3</sup> )                | 24-hour        | <b>4</b>                       | 4                              | Unchanged        |
|                                        | 8-hour         | <b>10</b>                      | 10                             | Unchanged        |
|                                        | 1-hour         | <b>35</b>                      | 35                             | Unchanged        |
|                                        | 15-minute      | <b>100</b>                     | 100                            | Unchanged        |

Note: those in bold are more stringent than Nepali regulations and will be used for the purpose of monitoring any short-term impacts on air quality

Source: ADB TA Consultant

#### H. NOISE

#### Ambient Noise Level Guidelines

| Receptor                                              | One Hour L <sub>Aeq</sub> (dBA) |                         |
|-------------------------------------------------------|---------------------------------|-------------------------|
|                                                       | Daytime 07:00 - 22:00           | Nighttime 22:00 - 07:00 |
| Residential; institutional; educational <sup>17</sup> | <b>55</b>                       | <b>45</b>               |
| Industrial; commercial                                | <b>70</b>                       | 70                      |

Note: a combination of Nepali and WHO will need to be applied as the most stringent noise levels based on the area and individual receptor in question. For commercial area, rural residential area and peaceful area the Nepali standards shall be complied. For industrial area the WHO guidelines shall be complied. In an urban residential area or mixed residential area, the WHO guidelines shall be complied, and at any individual residential receptor in an industrial or commercial zone the WHO guidelines will be applied. If the applicable noise levels are already exceeded by background the maximum increase in background level at the receptor is 3dBA.

Source: Guidelines for Community Noise, World Health Organization (WHO), 1999.

#### Noise Limits for Various Working Environments

| Location / activity                                       | Equivalent level LA <sub>eq,8h</sub> | Maximum LA <sub>max, fast</sub> |
|-----------------------------------------------------------|--------------------------------------|---------------------------------|
| Heavy Industry (no demand for oral communication)         | 85 dB(A)                             | 110 dB(A)                       |
| Light industry (decreasing demand for oral communication) | 50-65 dB(A)                          | 110 dB(A)                       |
| Open offices, control rooms, service counters or similar  | 45-50 dB(A)                          | -                               |
| Individual offices (no disturbing noise)                  | 40-45 dB(A)                          | -                               |
| Classrooms, lecture halls                                 | 35-40 dB(A)                          | -                               |

<sup>16</sup> <https://www.ifc.org/en/insights-reports/2000/general-environmental-health-and-safety-guidelines>

<sup>17</sup> For acceptable indoor noise levels for residential, institutional and educational settings refer to WHO (1999).

| Location / activity | Equivalent level LA <sub>eq,8h</sub> | Maximum LA <sub>max, fast</sub> |
|---------------------|--------------------------------------|---------------------------------|
| Hospitals           | 30-35 dB(A)                          | 40 dB(A)                        |

Source: *Guidelines for Community Noise, World Health Organization (WHO), 1999*

Control room noise should follow best practice guidelines as set out in the IFC EHS guidelines on OHS where the average noise level within the control room shall not exceed 40-50dBA during the length of the 8-hour working day.

## VIBRATION

International Guidelines – some of the most recognizable standards for structural vibration measurements are ISO 4866, British BS 7385-2, and German DIN 4150-3. The German DIN 4150-3 – Vibration in Buildings – Part 3: Effects on structures Standard provides short term and long-term limits for vibration at the foundation for various structures. It is useful as it provides short term values corresponding to construction impacts. Since the international standard focuses more on measurement of vibration this is considered as the international best practice to be followed by the Project, it has been used in various other recent ADB environmental assessments.<sup>19</sup>

### Guideline Values for Vibration Velocity to be Used When Evaluating the Effects of Short-term and Long-term Vibration on Structures

| Group | Type of structure                                                                                                                                                                                     | Guideline Values for Velocity (mm/s) |                |              |                 |                 |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|----------------|--------------|-----------------|-----------------|
|       |                                                                                                                                                                                                       | Short-term                           |                |              | Long-term       |                 |
|       |                                                                                                                                                                                                       | At foundation                        |                |              | Uppermost Floor | Uppermost Floor |
|       |                                                                                                                                                                                                       | Less than 10 Hz                      | 10 Hz to 50 Hz | 50 to 100 Hz | All frequencies | All frequencies |
| 1     | Buildings used for commercial purposes, industrial buildings and buildings of similar design                                                                                                          | 20                                   | 20 to 40       | 40 to 50     | 40              | 10              |
| 2     | Residential dwellings and buildings of similar design and/or use                                                                                                                                      | 5 (105 dB)                           | 5 to 15        | 15 to 20     | 15              | 5 (105 dB)      |
| 3     | Structures that because of their particular sensitivity to vibration, do not correspond to those listed in Lines 1 or 2 and have intrinsic value (e.g. buildings that are under a preservation order) | 3 (100.5 dB)                         | 2 to 8         | 8 to 10      | 8               | 2.5 (99.0 dB)   |

Source: DIN 4150-3, Structural Vibration, Part 3: Effect of vibration on structures

DIN 4150-3 notes that “experience has shown that if these values are complied with, damage that reduces the serviceability of the building will not occur. If damage nevertheless occurs, it is to be assumed that other causes are responsible. Exceeding the value in the table does not necessarily lead to damage”.

## WATER QUALITY

### Indicative Values for Treated Sanitary Sewage Discharges to Surface Water

<sup>18</sup> short-term vibrations are defined as those that do not occur often enough to cause structural fatigue and do not produce resonance in the structure being evaluated and long-term vibrations are all the other types of vibration.

<sup>19</sup> For example, <https://www.adb.org/projects/documents/51257-001-eia-0>



| Pollutants              | Units        | Guideline Value |
|-------------------------|--------------|-----------------|
| pH                      | pH           | 6 – 9           |
| BOD mg/l 30             | mg/l         | 30              |
| COD mg/l 125            | mg/l         | 125             |
| Total nitrogen mg/l 10  | mg/l         | 10              |
| Total phosphorus mg/l 2 | mg/l         | 2               |
| Oil and grease          | mg/l         | 10              |
| Total suspended solids  | mg/l         | 50              |
| Total coliform bacteria | MPN / 100 ml | 400             |

MPN = Most Probable Number

Source: <https://www.ifc.org/wps/wcm/connect/3d9a54ae-c44c-488d-9851-afeb368cb9f9/1-3+wastewater+and+ambient+water+quality.pdf?MOD=AJPERES&CVID=Is4Xbfn>

## ELECTRICAL SAFETY

### ICNIRP Limit Values Concerning Electric and Magnetic Fields (50 Hz) for the Public and at Working Places

| Source                  | Electric Field Strength [kV/m] | Magnetic Flux Density [ $\mu$ T] |
|-------------------------|--------------------------------|----------------------------------|
| Occupational exposure   | 10                             | 500                              |
| General public exposure | 5                              | 100                              |

Source: ICNIRP. Guidelines for limiting exposure to electromagnetic fields (up to 300 GHz). 2020

### Minimum Working Distance for Trained Employees to AC

| Voltage range phase to phase (kV) | Minimum working and clear hot stick distances (m) |
|-----------------------------------|---------------------------------------------------|
| 2.1 to 15                         | 0.6                                               |
| 15.1 to 35                        | 0.71                                              |

Source: <https://www.ifc.org/content/dam/ifc/doc/2000/2007-electric-transmission-distribution-ehs-guidelines-en.pdf>

## LIGHTING

(Source: <https://www.ifc.org/content/dam/ifc/doc/2000/2007-general-ehs-guidelines-occupational-health-and-safety-en.pdf>)

Workplaces should, to the degree feasible, receive natural light and be supplemented with sufficient artificial illumination to promote workers' safety and health, and enable safe equipment operation. Supplemental 'task lighting' may be required where specific visual acuity requirements should be met.

Emergency lighting of adequate intensity should be installed and automatically activated upon failure of the principal artificial light source to ensure safe shut-down, evacuation, etc.

### Minimum Lighting Levels for Workplace Safety

| Location / Activity                                                                                                        | Light Intensity   |
|----------------------------------------------------------------------------------------------------------------------------|-------------------|
| Emergency light                                                                                                            | 10 lux            |
| Outdoor non working areas                                                                                                  | 20 lux            |
| Simple orientation and temporary visits (machine storage, garage, warehouse)                                               | 50 lux            |
| Workspace with occasional visual tasks only (corridors, stairways, lobby, elevator, auditorium, etc.)                      | 100 lux           |
| Medium precision work (simple assembly, rough machine works, welding, packing, etc.)                                       | 200 lux           |
| Precision work (reading, moderately difficult assembly, sorting, checking, medium bench and machine works, etc.), offices. | 500 lux           |
| High precision work (difficult assembly, sewing, color inspection, fine sorting etc.)                                      | 1,000 – 3,000 lux |



*[Handwritten signature]*