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ACRONYMS AND ABBREVIATIONS

AoI	Area of Influence
BMP	Biodiversity Management Plan
CIA	Cumulative Impact Assessment
CIMP	Cumulative Impacts Management Plan
CITES	Convention on International Trade in Endangered Species
CR	Critically endangered
DRIFT	Downstream Response to Induced Flow Transitions
Eflow	Environment flow
EFMP	Environmental Flow Management Plan
EIA	Environmental Impact Assessment
EN	Endangered

EPC	Engineering, procurement, and construction
ERP	Emergency Response Plan
ESIA	Environmental and Social Impact Assessment
ESMC	Environmental and Social Management Cell
ESMMP	Environmental and Social Management and Monitoring Plan
ESMS	Environmental and Social Management System
EST	Environmental Supervision Team
ha	Hectare
IFC	International Finance Corporation
IUCN	International Union for Conservation of Nature
km/hr	kilometres per hour
LALRP	Land Acquisition and Livelihood Restoration Plan
LC	Least Concern
LNP	Langtang National Park
MSDS	Material Data Safety Sheet
NT	Near Threatened
NWEDC	Nepal Water and Energy Development Company
O&M	Operations and maintenance
PDA	Project Development Agreement
PH	Power House
PS	Performance Standards
RLNM	Red List of Nepal's Mammals
SEO	Safety and Environmental Officer
VU	Vulnerable

B.3 OPERATION ESMMP

1.1. KEY HIGHLIGHTS OF OPERATION PHASE MITIGATION MEASURES

This appendix describes the requirements for Operation ESMMP (OESMMP). Table B.3-1 lists the Management Plans required for this phase, which should be prepared by the Owner's (NWEDC) operations and maintenance (O&M) Contractor. This operational phase ESMMP shall be implemented in addition to, and in keeping with, the other management plans prepared for the Project and the requirements of the applicable reference framework.

This document presents a framework (hereafter referred to as the "Framework") of, and represents the minimum Lender's requirements for, the Operation Environment and Social Management and Monitoring Plan (hereafter referred to as the OESMMP) for the operation phase of the Upper Trishuli-1 Hydropower Project (Project). This OESMMP Framework has been formulated based on the Project understanding and the findings and recommendations of the Project Environmental and Social Impact Assessment (ESIA). The OESMMP Framework specifies the Management Plans, and the minimum requirements for these plans, to be developed in greater detail by the Operations & Maintenance Contractor (herein referred to as the Contractor), and which are required, as part of the contract between the Owner and the Contractor, to be implemented and complied with by the Contractor during the operations phase of the Project.

1.2. OESMMP PROCEDURES AND RESPONSIBILITIES

This section describes the process for approving and, as needed, modifying the OESMMP, and each party's responsibilities relating to the OESMMP.

1.2.1. OESMMP Approval Process

The development and approval of the OESMMP will be conducted in a timely manner in accordance with the dates specified in the Environmental and Social Action Plan (ESAP). The general development and approval process is as follows:

- The Contractor will develop a detailed Draft OESMMP, using this Framework to establish the minimum Lender's requirements;
- The Contractor will provide the Draft OESMMP to the Owner for its review;
- The Owner will provide the Draft OESMMP to the Lenders for its review;
- The Owner will incorporate any Lenders' comments along with its own comments and provide an integrated set of comments to the Contractor;
- The Contractor will address all comments provided by the Owner and provide a Final OESMMP to the Owner for its review;
- The Owner will review and, if acceptable, approve the Final OESMMP.
- Hard and soft signed copies of the Final OESMMP will be distributed by the Owner to the Contractor and the Lenders.

1.2.2. Management of Change

The need may arise to modify the OESMMP. The process below establishes Management of Change requirements for any and all changes to the OESMMP.

It is anticipated that most proposed changes to the OESMMP will be initiated by the Contractor, or its Subcontractors. The Management of Change process, however, does allow for the Owner or the Lenders to propose changes when it is reasonably likely that the current OESMMP is not sufficient to prevent:

- Serious health and safety incidents
- Impacts above those disclosed in the ESIA;
- New impacts not disclosed in the ESIA;
- Violation of Nepal law;
- Non-conformance with Lenders requirements, including the:
    - IFC Performance Standards
    - World Bank Environmental, Health, and Safety (EHS) General Guidelines (2007); and/or
    - Other Lender requirements.

Table B.2-1 below defines three categories of potential changes to the OESMMP and the review and approval process associated with each.

Table B.3-1: Project OESMMP Management of Change Process

Category of Change	Change Description	Action Required
Category 3	Changes that have the potential to, or are reasonably likely to, result in decreased Contractor ESHS performance, and/or are likely to result in an increase in ESHS impacts above those disclosed in the ESIA, result in new impacts not disclosed in the ESIA, require the acquisition of rights to use additional lands, or require additional permits/approvals from the government.	The Contractor will notify the Owner of the proposed change and provide the rationale and justification for the change. The Owner will notify the Lenders within one week of the receipt of the request for an OESMMP change. This category of change requires Owner and Lender approval before implementation.
Category 2	Changes which have the potential to, or are reasonably likely to result in, decreased Contractor ESHS performance, but are unlikely to result in any increase	The Contractor will notify the Owner of the proposed change and provide the rationale and justification for the change. The Owner will notify the Lenders within

	in environmental/social impacts above those described in the ESIA, or result in new impacts not described in the ESIA, or require the acquisition of rights to use additional lands.	one week of receipt of request for an OESMMP change. This category of change only requires approved by the Owner before implementation, unless the Lenders object within 30 days of receipt of the notice of change.
Category 1	Changes will are expected to result in similar or improved ESHS performance and are unlikely to result in any increase in environmental or social impacts above those described in the ESIA	The Contractor will notify the Owner of the proposed change and provide the rationale and justification for the change. The Owner will notify the Lenders as part of its quarterly Environmental and Social Issues Compliance Report. This category of change only requires Owner approval before implementation.

The Contractor is required to maintain a copy of the current version of the OESMMP at its site management office at all times. The Contractor understands that the Owner and/or Lender will use the current version of the OESMMP as the basis for conducting its periodic monitoring inspections.

1.2.3. OESMMP Responsibilities

The list below indicates the OESMMP-related responsibilities of each entity:

- Contractor (EPC) Requirements
    - Develop a Draft OESMMP, which addresses all applicable operations phase ESHS commitments based on the ESHS Compliance Registry to be completed by the Owner (see below under Owner's Requirements), and revise it as needed in order to obtain Owner approval;
    - Maintain a copy of the current approved OESMMP at the site management office at all times;
    - Follow the Management of Change process described above for any changes to the OESMMP;
    - Include language requiring full compliance with this OESMMP in any and all subcontracts the Contractor signs for the Project. If a Subcontractor proposes any changes to the current approved OESMMP, those changes must go through the approved Management of Change Process;
    - Provide appropriate training so as to assure that its workforce understands the requirements of OESMMP;

- Ensure all new project personnel as part of their induction process receive environmental and cultural sensitivity training as described in the Operations Worker Induction Training and Code of Conduct Management Plan and are provided a copy of the Worker Code of Conduct. All new personnel are required to provide written verification (induction sign-off) that they have completed the Project induction, understand their environmental and social obligations and the Code of Conduct, commit to comply with the Code, and understand the penalties for failure to comply with the Code;
- Employ qualified ESHS staff to oversee the Project's ESHS performance and ensure that staffing and resources are adequate, commensurate with the magnitude and timing of work and potential ESHS risks;
- Construct the Project in accordance with the OESMMP;
- Comply with the Owner's Community Grievance Mechanism by either referring person's with grievances to the Owner's designated representative (e.g., Community Liaison Officer) or logging and promptly submitting the grievance to the Owner's designated representative;
- Erect notification boards at the powerhouse and dam sites providing information for the local communities about the Project, as well as instructions on how to log any grievances or make suggestions along with contact information for the site managers, and environmental and social staff;
- Establish a Worker's Grievance Mechanism to provide a way for worker's to file grievances or make suggestions;
- Notify the Owner of any significant incidents or accidents in accordance with the requirements and timing of the Environmental and Social Issues Compliance Report;
- Comply with the applicable operations phase requirements in the Owner's Environmental and Social Management Plan;
- Monitor and report on the ESHS performance of the project during operations as described in the Operations Monitoring and Reporting section of this OESMMP;
- Participate in regular (at least quarterly) ESHS performance meetings with the Owner to review ESHS performance;
- Proactively implement corrective actions to address any situations where the Contractor is not meeting the requirements of the OESMMP;
- Retain documentation of Project compliance with the OESMMP to facilitate Owner and Lender compliance audits;
- Cooperate fully with all compliance audits conducted by the Owner, the Lenders, or the Lenders Independent Engineer (who is also responsible for serving as the Independent Environmental and Social Consultant); and

  - Cooperate fully and implement any Corrective Action Plans required by the Owner or the Lenders to address any situations where the Contractor is not meeting the requirements of the OESMMP or complying with the laws of Nepal.

- Owner (Owner) Requirements
  - Include language requiring the Contractor to comply with the approved OESMMP in the EPC Contract;
  - Prepare and maintain an Environmental, Social, Health, and Safety Compliance Registry, which includes all Project commitments in response to Government approvals, Lenders requirements, and discussions with local communities;
  - Review and approve the Contractor's OESMMP;
  - Comply with the Management of Change process described above for any proposed changes to the OESMMP;
  - Monitor contractor and subcontractor E&S performance and ensure the contractor monitors its own and all subcontractors' E&S performance throughout operations;
  - Monitor contractor and subcontractor ESHS performance and conformance with the OESMMP, and ensure the Contractor monitors its own and its subcontractors' ESHS performance throughout, including mobilization, operations, and decommissioning;
  - Hold regular (at least quarterly) ESHS performance meetings with the Contractor to review ESHS performance;
  - Notify the Contractor of the need for any corrective actions;
  - Issue a stop work order if the Contractor has not taken appropriate action to achieve compliance with ESHS requirements after repeated notices of violation and warnings of noncompliance, and significant ESHS impacts are occurring or imminent, until the Contractors ESHS performance is brought up to acceptable standards;
  - Provide the Lenders with copies of the Contractor's monitoring reports;
  - Cooperate fully with all compliance audits conducted by the Lenders or the Lenders Independent Engineer (who is also responsible for serving as the Independent Environmental and Social Consultant); and
  - Fully cooperate with any Lenders' Corrective Action Plans.
- Lender Requirements
  - Review and provide comments to the Owner on the Draft OESMMP;
  - Comply with the Management of Change process described above for any changes to the OESMMP;
  - Conduct periodic monitoring visits; and

- Provide the Owner with all Operations Monitoring Trip Reports and notify the Owner of the need for any Corrective Action Plans.

1.3. OPERATIONS MANAGEMENT PLANS REQUIREMENTS

This section identifies the Lender's required minimum requirements for each operations phase environmental and social management plan for the Project. The O&M Contractor will prepare detailed management plans based on these minimum requirements.

This OESMMP Framework includes minimum Lender requirements for each of the following Management Plans:

- Operation Worker Induction Training and Code of Conduct Management Plan
- Disaster Management and Emergency Preparedness and Response Management Plan
- Spill Prevention and Response Management Plan
- Community Health and Safety Management Plan
- Occupational Health and Safety Management Plan
- Worker Accommodation Management Plan
- Site Security Management Plan
- Traffic Management Plan
- Waste Management Plan
- Air and Noise Management Plan
- Biodiversity Management Plan
- Sediment Management Plan
- O&M Monitoring and Reporting Plan

1.3.1. Operation Worker Induction Training and Code of Conduct Management Plan

The Contractor is responsible for providing appropriate health and safety (H&S) and environmental and cultural sensitivity training to its workers, as described below:

- All new Project personnel shall receive appropriate H&S training during their induction (i.e., within their first week of work). The training shall be conducted by an experienced and qualified H&S professional. The H&S training shall involve a detailed review of the Contractor's Occupational Health and Safety Management Plan (see Section 1.3.10), a detailed description of the H&S risks each employee will be exposed to given their work assignment, identification of the appropriate Personal Protective Equipment (PPE), and the proper use of the PPE. The Occupational Health and Safety Management Plan provides additional requirements relative to ongoing and refresher H&S training.

- All new Project personnel shall receive appropriate environmental and cultural sensitivity training during their induction (i.e., within their first week of work). The training shall be conducted by an experienced and qualified environmental science professional and a social science professional. This training shall involve a description of the sensitive environmental setting of the Project (i.e., adjacent to the Langtang National Park) and the potential presence threatened and endangered species. The new personnel shall be informed about these species and what actions they should take if they were to encounter any of these species, or wildlife in general. The new personnel will also receive training regarding the customs and practices of the Tamang people and the Contractor's requirements regarding any interactions with the Tamang of other local residents.
- The Contractor shall develop a Worker Code of Conduct, which emphasizes the importance of appropriate behaviour, respect for local communities and customs, protection of the environment, including fish, wildlife, and trees, and compliance with all Nepalese laws and regulations. This Code of Conduct shall be reviewed and approved by the Owner and the Lenders prior to the initiation of operations. The Code of Conduct should be available to local communities at the Public Information Centres (PIC) established for the Project. All new Project personnel shall receive appropriate training in the Worker Code of Conduct during their induction (i.e., within their first week of work). The Code of Conduct should address at least the following topics:
    - Expectations for workers to carry out their work in a safe manner, and to look after the safety of others.
    - Expectations of workers to look after, be aware of, and minimize their impacts on the environment. This includes a prohibition on unauthorized entrance to Langtang National Park or Community Forest lands, hunting, fishing, poaching, logging, collection of firewood, clearing of vegetation, collection of/trade in plants, animals, and non-timber forest products.
    - Urination and defecation in open areas and water bodies and haphazard disposal of solid waste shall be prohibited.
    - All the workers/labourers shall comply with the laws and regulations of Nepal.
    - Possession of illegal substances, abuse of drugs and alcohol, gambling, carrying of firearms, and involvement with prostitutes shall be prohibited.
    - Workers shall respect local customs and traditions. Workers visiting the local communities or interacting with local residents shall follow appropriate standards of dress and personal hygiene, must behave in a manner consistent with the Code of Conduct. Fighting (physical or verbal), creating nuisances and disturbances in or near communities, and disrespecting local customs and traditions shall be prohibited.
    - As part of the Code of Conduct, the Contractor must include sanctions (e.g. penalties up to dismissal) for workers violating this Code of Conduct.

- The Contractor shall retain documentation demonstrating that every Project employee, including subcontractor personnel, has received the required H&S training, environmental and cultural sensitivity training, and has signed the Code of Conduct.
- The Contractor shall also establish a worker grievance redressal mechanism to enable workers to file complaints. The Contractor shall inform the workers of the grievance mechanism at the time of recruitment and make it easily accessible to them. The mechanism should involve an appropriate level of management and address concerns promptly, using an understandable and transparent process that provides timely feedback to those concerned, without any retribution. The mechanism should also allow for anonymous complaints to be raised and addressed. The mechanism should not impede access to other judicial or administrative remedies that might be available under the law or through existing arbitration procedures, or substitute for grievance mechanisms provided through collective agreements.
- The Contractor shall provide a grievance mechanism for workers (and their organizations, where they exist) to raise workplace concerns. The Contractor shall inform the workers of the grievance mechanism at the time of recruitment and make it easily accessible to them. The mechanism should involve an appropriate level of management and address concerns promptly, using an understandable and transparent process that provides timely feedback to those concerned, without any retribution. The mechanism should also allow for anonymous complaints to be raised and addressed. The mechanism should not impede access to other judicial or administrative remedies that might be available under the law or through existing arbitration procedures, or substitute for grievance mechanisms provided through collective agreements.

1.3.2. Disaster Management and Emergency Preparedness and Response Management Plan

This Management Plan shall address all reasonably foreseeable emergencies that may occur at the Project, including dam break, Glacial Lake Outburst Flood, natural flood, sudden unexpected release of water from the dam or powerhouse (e.g., from improper spillway gate operation), earthquake, landslide, fire, landslides, tunnel collapse, hazardous material spills, drowning or other medical emergency, traffic accident, bomb threat, and similar events.

For each of these emergency situations, the Management Plan shall describe the:

- Contractor's Command Structure for responding to the emergency;
- Measures the Contractor will take to prevent the emergency from occurring, if possible;
- Monitoring the Contractor will conduct in order to detect developing emergency conditions (e.g., monitor flow in the river, real-time gas monitoring system in the tunnel);
- Equipment the Contractor will ensure is available and well-maintained at the Project site;
- Alarms, including both visual and auditory alerts, to notify personnel and the public of emergency conditions;

- Communication procedures and equipment that the Contractor shall use for notifying its personnel, nearby and downstream residents, and local and national government of impending or actual emergency conditions;
- Training exercises and drills the Contractor will conduct to ensure workers are aware of and prepared in the event of each type of emergency;
- Awareness and other training for local residents so they know how to protect themselves in the event of an emergency;
- Evacuation plans for its personnel as well as nearby or downstream residents;
- Rescure procedures;
- Records the Contractor will maintain onsite documenting the training exercises and drills it has conducted;
- Detailed procedures the Contractor will follow in the event of each type of emergency;
- Conditions under which the Project can return to normal operations and the procedures to document those conditions;
- Measures the Contractor will take to document lessons learned from training exercises, drills and actual emergencies.

The O&M Contractor shall prepare this Emergency Preparedness and Response Management Plan in consultation with appropriate National and Local government agencies. The O&M Contractor shall conduct periodic review and update of these plan on no less than an annual basis.

1.3.3. Spill Prevention and Response Management Plan

Environmental emergency procedures relate primarily to the event of accidental leaks, spills, emissions. Therefore, the Contractor shall respond on a case-by-case basis to such emergencies and shall initiate event-specific measures in terms of notifications and reactions.

In the event that accidental leakage or spillage of diesel or other hazardous materials/wastes takes place, standard response procedures shall be followed immediately by the O&M Contractor such as:

- The O&M Contractor should stockpile at the Project site the equipment and materials necessary to respond to potential range of potential accidents/spills.
- The person who identified the leakage/spillage shall immediately check if anyone is injured and then inform the SEO and EST;
- The O&M Contractor shall ensure that all injured persons, if any, are treated and assess the nature of the substance that has spilled/leaked;
- Whenever the accidents/incidents generate serious environmental pollution or potential risks resulting in serious environmental pollution problems (e.g. spillage/leakage of toxic or

chemicals, large scale spillage/leakage, or spillage/leakage into the nearby water bodies which are used for irrigation / portable water), the SEO shall immediately inform the EST.

- In such cases, the Contractor shall take immediate action to prevent the spillage/leakage and contain or divert the spilled/leaked liquid to a nearby non-sensitive area;
- The Contractor shall arrange maintenance staff with appropriate protective clothing to clean up the spill. This may be achieved through covering the area with sawdust (if the quantity of spillage/leakage is small), or sand bags (if the quantity is large); and/or using a shovel to remove the topsoil (if the spillage/leakage occurs on bare ground);
- Contractor Environmental Health and Safety team shall identify the possible accidental leak/spill of fuel/chemicals/waste as per the type, nature of materials to be handled at site and detailed procedure for spill prevention and management to be prepared and awareness training on the same to be imparted to all responsible personnel;
- Spilled chemicals must not be flushed to local surface drainage systems. Instead, government approved clean-up and disposal procedures shall be carried out;
- Depending on the nature and extent of the chemical spill, evacuation of the activity at the site may be considered. The Contractor/SEO has the authority to make the final decision.
- The Contractor shall prepare a report with root cause analysis for the spill or incident, remedial action taken, consequences/damage from the spill, and proposed corrective actions. The incident report shall be submitted to the EST for review and shall be maintained in the records.
- Workers shall receive training on environmental emergency procedures, so that they are fully aware of the various possible emergency situations during Project operations and the applicable emergency response procedures, as well as the danger and potential damages caused by the emergency to the environment and the people.

1.3.4. Waste Management Plan

The O&M Contractor shall prepare a Waste Management Plan before commencement of Project work including the following minimum lender requirements:

1.3.4.1. Domestic Solid Waste

- Submit a method statement detailing a solid waste control system (e.g., storage, provision of bins, site clean-up schedule, bin clean-out schedule, etc.) to the Owner for approval.
- Ensure that all facilities are maintained in a neat and tidy condition and the site shall be kept free of litter. At all places of work, the Contractor shall provide litter bins, containers, and refuse collection facilities for later disposal;
- Waste containers shall be strategically placed in visible locations easily identified and marked (e.g., recycle, organic waste, unusable waste, hazardous waste, paper, glass). Waste storage containers shall be covered, tip-proof, weatherproof, and scavenger proof, and should not attract wildlife. Solid waste may be temporarily stored on site in a designated area

approved by the Owner. The storage area shall have a cover to avoid direct contact with surface runoff, and be fenced off to prevent wind-blown litter;

- Educate employees on segregation of waste with demarcated bins for recyclables and perishables placed in common areas.
- Collect and separate on-site recyclable materials from other waste. Collected recyclable material shall be re-used or sold to a waste collector for recycling.
- Transport domestic waste off site-using a license waste collector in covered containers or covered trucks at least once a week for at an appropriate and permitted waste disposal facility;.
- If collection of waste is not practical in remote locations, a landfill may be required. As described above for construction waste, if the EPC or O&M Contractor determine an on-site landfill is required, that will trigger the MoC provisions in this OESMMP and would require both government and lender approval and implementation of required mitigation measures and an update to the Waste Management Plan; and
- Prohibit burning of solid waste in open air conditions and random disposal of solid waste within and outside the Project areas.

1.3.4.2. Hazardous Waste

The Contractor shall carry out the following activities:

- Ensure all hazardous waste (e.g., used oil, lubricants, cleaning materials, transformer oil, oil soaked cloths, paint) is properly labelled; stored separately from other solid waste onsite at a location provided with impervious surface, a roof/covering, secondary containment system, and appropriate warning signs; transported offsite by an approved transporter; and disposed at a government approved and licensed disposal facility. Maintain records/manifest/disposal certificates to document proper handling and disposal of all hazardous wastes;
- Provide oil and grease trap at vehicle, machinery and equipment maintenance area and provide regular upkeep and removal.
- Recycle used oil and grease to the extent possible through an approved used oil recycling company;
- Maintain vehicles, machineries and equipment only at designated areas;
- Only allow authorized and trained personnel to handle hazardous waste;
- Inform all personnel of the emergency measures to be taken in case of spills or accidents due to improper use of these substances.

1.3.4.3. Wastewater

- Provide adequate and appropriate wastewater treatment either in the form of a package wastewater treatment facility or if soils conditions and waste loads are adequate, a

community septic system, which is designed, installed, operated and maintained in accordance with the regulations and specifications of Nepal;

- Provide proper maintenance and ensure effective operation of the domestic wastewater treatment plant/system;
- Provide regulator monitoring of treated wastewater effluent quality to ensure it complies with Nepal and World Bank standards; and
- No untreated /raw sewage shall be discharged to any waterbody and prohibit open defecation.

1.3.5. Community Health and Safety Management Plan

The O&M Contractor shall undertake at least the following actions to protect the public from Project operations:

- Place warning signs to alert the public to potential dangers (e.g., upstream of the dam, immediately downstream of the dam, near the desander discharge, below the tailrace, near the powerhouse, near the takeoff yard, and at transmission towers);
- Install a warning system for sudden water level fluctuations at major locations/communities downstream of the proposed dam site (to include a siren network to inform those in the diversion reach in case of a sudden release of water);
- Install appropriate traffic control and warning signs to notify vehicular drivers and local communities of traffic risks and hazards;
- Ensure adequate and timely disclosure of information to the local community in terms of Project activities and available opportunities, in keeping with Stakeholder Engagement Plan formulated for the Project.

1.3.6. Occupational Health and Safety Management Plan

The Contractor shall prepare and implement an Occupational Health and Safety (OHS) Management Plan to address matters regarding the health and wellbeing of workers, Project staff and nearby communities during Project operations. The OHS Management Plan shall:

- Describe potential health and safety hazards based upon the specific project works/activities;
- Describe the procedures and equipment which are technically appropriate to deal with such works/activities;
- Describe all major responsibilities and authorities relating to the implementation of the OHS Management Plan;
- Describe the specific project supervision methods (including audits, documentation and record-keeping, on-site monitoring and medical surveillance) to be implemented to ensure that the plan is completely and properly implemented;
- Describe the specific health and safety training that will be provided to any persons involved and the minimum levels of training required;

- Describe the emergency response procedures that will be implemented; and
- Describe the estimated cost, time schedule and assigned responsibility for implementing each component of the plan.

The O&M Contractor shall:

- Provide robust health and safety training to all personnel appropriate for their job responsibilities;
- Provide all personnel with the proper Personal Protective Equipment (e.g. safety boots, safety glasses, helmets, hearing protection, gloves, respirators), or PPE;
- Alternate work schedule to avoid continuous exposure of workers to higher noise levels.
- Only use trained and authorized personnel for cranes and other lifting equipment;
- Carry out health screening and fitness test of all workers at the time of recruitment. This health screening shall be undertaken in keeping with the work profiles of the workers. The fitness test shall screen for communicable diseases and any health risks which may create issues in undertaking the task assigned. In addition to this, regular annual health check-ups shall be undertaken of all workers;
- Provide appropriate information and education to the workforce on basic personal hygiene, prevention of diseases, including respiratory diseases, water and food borne diseases such as diarrhoea and tuberculosis;
- Implement a program for workers and local communities for the prevention, detection, screening, and diagnosis of sexually transmitted diseases, especially with regard to HIV/AIDS. The program shall also include information on alcohol abuse and human trafficking;
- Distribute educational materials to all workers including brochures, and leaflets which provide information on symptoms of disease, and available counselling and treatment services;
- Provide basic first-aid services to the workers as well as emergency facilities for work-related accidents, including medical equipment suitable for the personnel, type of operation, an ambulance or motorized vehicle, and the degree of treatment likely to be required prior to transportation to a hospital or health care centre;
- Use appropriate safe and decent transportation mode to transport workers to Project sites, during the operation phase. Labourers shall be provided with transportation in vehicles equipped with canopy (closed vehicles) and seating facility;
- Provide proper marking for identification of locations of flammable storages;
- Provide sufficient number of personnel with first aid training to respond emergency;
- Send details of any accident to the Owner as soon as practicable after its occurrence;

- Maintain records and reports concerning health, safety incidents, and damage to property, as the Owner may reasonably require;
- Provide training to the workers on climbing techniques, and rescue of fall-arrested workers;
- Use appropriate tool bag for raising or lowing tools to workers on elevated structures;
- Lifting devices, including equipment, slings, ropes, chains, and straps, shall be inspected, certified, and labelled to confirm their weight capacities;
- Provide proper lighting in tunnel and other underground areas;
- Provide adequate sanitary facilities to prevent any health ailments and to meet the emergency needs;
- Provide safe drinking water to the workers at residential accommodations and other facilities meeting Nepal and WHO drinking water quality standards;
- The Contractor will notify and provide training to all appropriate personnel of any changes to the Occupational Health and Safety Management Plan per the Management of Change process.
- The safety training shall be accompanied by regular refresher trainings;
- The speed of vehicles moving within the Project site shall be limited to 15-20 km/hr;
- MSDSs for each chemical present on the worksite shall be maintained; and
- The Contractor shall keep records of attention and issues covered and provide such records when required by ESMC or SEO.

1.3.7. Worker Accommodations Management Plan

The O&M Contractor shall provide suitable, safe, and comfortable facilities for its workers, which shall be in general conformance with the IFC Guidance Note on Worker Accommodations (IFC 2009). The worker accommodations shall include:

- Dormitories, rest areas, lavatory facilities, canteens, recreation facilities, and a health/first aid clinic adequate for the numbers of personnel;
- Prohibit the purchase or serving to workers any fish caught in the Trishuli River or any wild/bush meat.
- Adequate and suitable facilities for washing clothes and utensils;
- Adequate power, heating, air conditioning and telecom system;
- Adequate and safe potable water receiving appropriate treatment;
- Adequate and appropriate wastewater treatment either in the form of a package wastewater treatment facility or if soils conditions and waste loads are adequate, a community septic

system, which is designed, installed, operated and maintained in accordance with the regulations and specifications of Nepal;

- No untreated /raw sewage shall be discharged to any waterbody and prohibit open defecation; and
- Recycle/reuse water to the extent possible.

1.3.8. Site Security Management Plan

The O&M Contractor is responsible for maintaining the safety and security of all Contractor personnel and visitors to the Project site. The Contractor shall be responsible for the following:

- Prepare a Security Risk Assessment identifying the key security risks to the Project;
- Ensure the project is compliant with IFC Performance Standard 4 and the UN Voluntary Principles on Security and Human Rights (http://www.voluntaryprinciples.org/);
- Keep unauthorized persons off the Project site. Authorized persons shall be limited to the Contractor's and the Owner's personnel, and any visitors with prior notification of the Contractor and approval by the Owner;
- Provide adequate night-time lighting;
- Install a perimeter security fence around the Worker's Accommodations with guards to restrict access to public;
- Arrange guided tours whenever required to inform people about Project operations;
- Ensure that security personnel on-site are not armed, and receive detailed training on community engagement and the community grievance mechanism; and
- Ensure that security personnel are trained in the Disaster Management and Emergency Preparedness and Response Management Plan.

1.3.9. Traffic Management Plan

The O&M Contractor shall:

- Make sure Project vehicles, including service vehicles making deliveries to the Project, comply with designated speed limits;
- Ensure that all suppliers and their delivery drivers are aware of reduced speed zones (e.g., near schools, markets, villages), procedures, and restrictions (e.g. restricted areas) while navigating through the roads near the site. Use only designated routes to the Project site, appropriately sized vehicles suitable to the class of roads in the area, and restrict loads to prevent damage to local roads and bridges used for transportation purposes;
- Clearly mark pedestrian-safe access routes and crossing locations;
- Promote and distribute traffic safety information to local residents;

- Install traffic signs (including paint, easel, sign material), road marking, and guard rails to maintain pedestrian safety during construction;
- Appropriately secure materials in the vehicles to ensure safe passage between destinations during transportation;
- Clean up any spills or damage caused by Project-related vehicles; and
- Entry/exit routes and transportation timings for heavy transport vehicles shall be planned to minimise disturbance to the surrounding locality.

1.3.10. Air and Noise Management Plan

- Regularly maintain vehicles and avoid idling time to minimise emissions
- Service or replace vehicle emitting significant black smoke in their exhausts;
- Restrict unnecessary use of vehicle horns;
- Use rubber padding underneath high noise and vibration generating machines.

1.3.11. Biodiversity Management Plan

The O&M Contractor shall coordinate with the Owner and comply with the applicable elements of the overall Project's Biodiversity Management Plan (BMP, see Owner's Environmental and Social Management and Monitoring Plan). While the Owner has primary responsibility for the BMP, the O&M Contractor has a critical role in assuring that the required Environmental Flow (Eflow), fish ladder flow, and attraction flow are all provided as described in *Design Advice on Fish Ladder and Associated Spillway Designs at the Upper Trishuli-1 Hydropower Project* (SWECO 2018), or as may be subsequently modified if the Adaptive Management Program is triggered.

The O&M Contractor also shall:

- Avoid any clearing of trees or vegetation not specifically identified in the Project ESIA;
- Designate routes for movement of O&M vehicles to avoid additional soil compaction in other areas.
- Prohibit the serving to its employees any wild fish or game caught in the Project Area, including the Trishuli River and Langtang National Park;
- Maintain appropriate drainage and stabilize any eroding or unstable slopes due to Project facilities (e.g., Project roads, transmission line) and along the margins of the reservoir;
- Enforce the Worker Code of Conduct, which prohibits unauthorized entrance to Langtang National Park or Community Forest lands, hunting, fishing, poaching, logging, collection of firewood, clearing of vegetation, and collection of/trade in plants, animals, and non-timber forest products;
- Regular checking of the vacuums or holes in the transmission towers to avoid nesting by the birds;

- Install signage and speed humps in areas where wildlife crossing is likely;
- Train vehicle drivers regarding the driving risks through biodiversity sensitive areas and along remote roads;
- Any significant increase in vehicle strikes of wildlife shall require review of location of signage and training efficacy of drivers;

1.3.12. Sediment Management Plan

The O&M Contractor shall develop a detailed Sediment Management Plan describing the methods that shall be used to properly manage sediment at the Project. The purpose of the Sediment Management Plan is (1) to maintain the life expectancy of the project reservoir; (2) protect the turbines from exposure to sediment; and (3) flush the sediment in a manner that minimizes adverse impacts on fish and aquatic ecology in the diversion reach and downstream of the tailrace. The Sediment Management Plan shall specifically:

- Try to mimic natural sediment transport in the Trishuli River to the extent possible in terms of timing and quantities;
- Describe how large coarse material (e.g., cobble, boulders) will be managed;
- Stabilize any areas subject to river channel or bank erosion in the diversion reach or immediately downstream of the tailwaters;
- Flush sediment from the desander only during periods when sufficient flow is occurring in the diversion reach to transport the sediment through the diversion reach. The O&M Contractor shall determine the flow threshold required to transport sediments from the desander based on its partical size, and only flush the desander when flows in the diversion reach exceed this threshold;
- Flush sediment from the reservoir during the monsoon season when spillage is occurring to help transport the sediment through the diversion reach. More frequent releases of small quantities of sediment from the reservoir is preferred to less frequent release of slugs of sediment; and
- Avoid releases of sediment from the reservoir and the desander during snowtrout migration and spawning periods (e.g., late February through early May).

1.3.13. O&M Monitoring and Reporting Management Plan

The O&M Contractor shall conduct at least the following monitoring and report the findings to the Owner in accordance with the table below:

Number	Resource Area	Required Monitoring	Responsibility	Frequency
1	Land and Soil	Monitor reservoir shoreline stability and stabilize slopes as needed	O&M Contractor	Quarterly

2	Water Quality	Monitor treated wastewater effluent quality	O&M Contractor	Weekly or at any sign of upset condition
3	Water Quality	Monitor reservoir water quality	O&M Contractor	Weekly
4	Water Quality	Monitor water quality in the diversion reach and downstream of the powerhouse	O&M Contractor	Annual
5	Hydrology	Install flow gauge to monitor Environmental Flow release	O&M Contractor	Continuous
6	Sediment	Monitor sediment deposition in reservoir	O&M Contractor	Semi-annually
7	Sediment	Monitor deposition and accumulation of sediment in the diversion reach	O&M Contractor	After flushing sediment from reservoir or the desander
8	River Erosion	Monitor diversion reach and area downstream of powerhouse for any signs of stream channel or bank erosion	O&M Contractor	Quarterly and after large flow events
9	Biodiversity	Monitor bird carcasses electrocuted and records of any threatened or migratory species injury or mortality.	O&M Contractor	Monthly
10	Biodiversity	Monitor number of vehicle strikes of wildlife and species of wildlife injured or killed	O&M Contractor and Owner	Ongoing
11	Biodiversity	Monitor ability of fish to navigate the diversion reach and access fish ladder	O&M Contractor and Owner	During spring migration period (late February – May)

12	Biodiversity	Monitor ability and number of fish to successfully navigate through the fish ladder	O&M Contractor and Owner	During spring migration period (late February – May)
13	Biodiversity	Monitor ability of fish to successfully move downstream pass the dam without injury or mortality	O&M Contractor and Owner	During Fall migration period (August – October)
14	OHS	Monitor noise level in the powerhouse area to ensure proper PPE is provided to personnel	O&M Contractor	Once upon full operation
15	OHS	Monitor potable water quality at end of tap in worker accommodations	O&M Contractor	Upon start up and then annually

The O&M Contractor shall provide:

- Monthly Progress Reports to the Owner
- Quarterly Environmental and Social Issues Compliance Reports

These reports shall include, at a minimum, the following ESHS information:

- Health and Safety Performance – including hours worked, recordable incidents (e.g., lost time accidents, medical treatment cases) and corresponding Root Cause Analysis, first aid cases, high potential near misses, and injuries to the public or visitors, and remedial and preventative actions taken (e.g., new equipment, updated training);
- Environmental Performance – air/water/noise/vibration/slope stability monitoring results, specifically identifying any results exceeding Nepal or World Bank Group EHS General Guidelines; any incidents in which the required Environmental Flow was not met, for what duration, and why; any hazardous material spills or discharges of untreated wastewater or process water;
- Social Performance – including the number, type, status, and outcome of any community grievances that were filed;
- Labour Performance - including the number, type, status, and outcome of any worker grievances that were filed; number, type, status, and outcome of any Code of Conduct violations; number of workers disaggregated by place of origin (i.e., expatriate, local, or non-local Nepalis), gender, and skill level (e.g., unskilled, skilled, supervisory, professional,

management); EHS training provided, including the dates, location, number of trainees, and topics;

- ESHS Staffing – including identifying any new hires or departures, and a listing of current ESHS staff and titles;
- ESHS Requirements – including any non-compliance incidents with permits or national law, project commitments, or other ESHS requirements; and identification of any impacts outside the Project's approved footprint;
- ESHS Inspections and Audits – including any by the Contractor, Owner, Lender, or the Lender's Independent Engineer, and providing the date, sites visited, major findings, and any actions taken;
- Stakeholder Engagement – including any formal or informal meetings or information disclosure with stakeholder, including the date, location, number of attendees, and topics discussed;
- Major Changes – including any changes to the OESMMP or general ESHS practices, and any actions taken in response to previous notices of deficiency.