Bhutan for Life

Environmental and Social Management Plan for

Jomotsangkha Wildlife Sanctuary,

2021

1. Introduction

(A) Project Background

The Bhutan for Life (BFL) project aims to ensure a robust network of protected areas and biological corridors that secures human well-being, biodiversity conservation and increase climate resilience in Bhutan. The project provides a 14-year financial bridge that allows for immediate improvement in the management of Bhutan's protected areas for climate resilience, and the prompt delivery of mitigation, adaptation and biodiversity gains, while the country gradually ratchets up its own financing resources.

BFL seeks to achieve the following objectives:

- Help Bhutan remain carbon neutral by increasing forest and vegetative cover within the Protected Area System;
- Enhance the socio-economic wellbeing of communities in and in the vicinity of the PAs through climate-informed natural resources management;
- Maintain stable, thriving and diverse populations of key species contributing toward national and global biodiversity goals;
- Strengthen organizational, institutional, and financial capacity for effective management of PAS.

BFL includes five components that reflect these goals, divided into 16 milestones (or outputs) and over 80 detailed activities.

(B) Scope of ESMP

The preparation of this Environmental and Social Management Plan (ESMP) was required in order to manage the environmental and social impacts through and specific mitigation actions required to implement the project in accordance with the requirements of WWF's Social Safeguards Integrated Policies and Procedures (SIPP), the project's Environmental and Social Management Framework (ESMF), and applicable national legislation and regulations.

The ESMP provides an overview of the environmental and social baseline conditions on the routes of the proposed second segment of the project summarizes the potential impacts associated with the proposed activities and sets out the management measures required to mitigate any potential negative impacts.

This ESMP will be implemented by BFL focal person in each park authority (PA) and biological corridor (BC), and by the contractor to be commissioned by each PA/BC for the project.

(C) Purpose of ESMP

This Site-Specific ESMP is a project-specific source document detailing the environmental and social protection requirements to mitigate and minimize the adverse impacts. The ESMP's primary purpose is to ensure that the environmental requirements and social commitments associated with the project are carried forward into implementation and operational phases of the project and are effectively managed. The specific objectives of this ESMP are as hereunder:

- Minimizing any adverse environmental, social and health impacts resulting from the project activities;
- Conducting all project activities in accordance with the relevant RGoB Laws and WWF's safeguard operational policies and guidelines;

Preventing environmental degradation as a result of either individual subprojects or their cumulative effects;

- Enhancing the positive environmental and social outcomes of project activities;
- Ensuring that the proposed mitigation measures are feasible and cost-efficient;
- Providing an Action Plan to ensure that the project impact mitigation measures are properly implemented and monitored;
- Ensuring that all stakeholders are engaged in the project activities' preparation and implementation, and their concerns are fully addressed.

(D) Applicable law, policies, and regulation

This ESMP is developed by following the guidelines as set forth in the BFL's ESMF.

Applicable RGoB laws and policies include the Constitution of the Kingdom of Bhutan, 2008; legislation on land and moveable property (Land Act of Bhutan 2007; Land Rules, 2007; The Moveable Cultural Property act of Bhutan, 2005); legislation and regulations on forests and protected areas (National Environment Protection Act, 2007; Forest and Nature Conservation Act of Bhutan, 1995; Forest and Nature Conservation Rules and Regulations of Bhutan, 2017; National Forest Policy, 2011); legislation on water and waste prevention (Water Act of Bhutan, 2011; Waste Prevention and Management Act, 2009); legislative requirements on environmental assessment (Environmental Assessment Act, 2000 and Regulations on the Environmental Clearance of Projects, 2001); and other relevant laws (The Local Government Act of Bhutan, 2009; Livestock Act of Bhutan, 2001; The Biodiversity Act of Bhutan, 2003; The Pesticides Act of Bhutan, 2000; The Penal Code of Bhutan, 2004; National Access and Benefit Sharing (ABS) Policy (Draft), 2014).

WWF's safeguards policies that are relevant to this project are as follows: Policy on Environment and Social Risk Management; Policy on Protection of Natural Habitats; Policy on Involuntary Resettlement; Policy on Indigenous Peoples; Standard on Pest Management; Policy on Accountability and Grievance System; Standard on Physical Cultural Resources; as well as general standards on occupational and community health and safety and on energy efficiency.

In general, RGoB's laws, policies, and guidelines are in line with the WWF's environmental and social safeguards requirements. However, there are a few differences between the two systems. With regard to environmental impacts, there are no direct contradictions between the RGoB laws and regulations and the WWF's SIPP, but the requirements of the latter are more extensive. All project activities should fully comply both with the RGoB's Regulations on the Environmental Clearance of Projects, and with the procedures and mitigation measures prescribed in this ESMF. In case that the WWF's SIPP requirements are more extensive, strict, or detailed than the RGoB legislation and policies, the former will apply to all project activities. With regard to social impacts, the primary discrepancies between the RGoB laws and regulations and the WWF's SIPP refer to the status of non-title holders and informal land use, and the commitment to participatory decision-making processes. First, according to the WWF's SIPP, all users of land and natural resources (including people that lack any formal legal ownership title or usage rights) are eligible to some form of assistance or compensation if the project adversely affects their livelihoods. The RGoB laws only recognize the eligibility of land owners or formal users to receive compensation in such cases. Second, the WWF's SIPP require extensive community consultations as part of the development of various safeguards documents and during project activities. RGoB legislation does not include similar requirements. For the purposes of the BFL project, the provisions of the WWF's SIPP shall prevail over the RGoB legislation in all cases of discrepancy.

2. Environmental and Socio-Economic Conditions

Jomotsangkha Wildlife Sanctuary well known by the name Khaling Wildlife Sanctuary (KWS) was notified in 1974 and gazette in 1993. The sanctuary has an area of 362.49 sq.km making it the second smallest naturally protected area of Bhutan. It is located in south-eastern part of Bhutan under Samdrup Jongkhar district. In the year 2014, KWS was renamed as Jomotsangkha Wildlife Sanctuary (JWS). JWS has topography of plain grasslands with deep gully formations in the foothills due to heavy rainfall and there are steep slopes when getting to the high hills. Sandy soils are found mostly in the plains, loamy soils along the hills and across the valleys there are clay deposits from which the wild animals get their natural mineral licks. There are 14 different sizes of perennial water bodies that flow through the sanctuary.

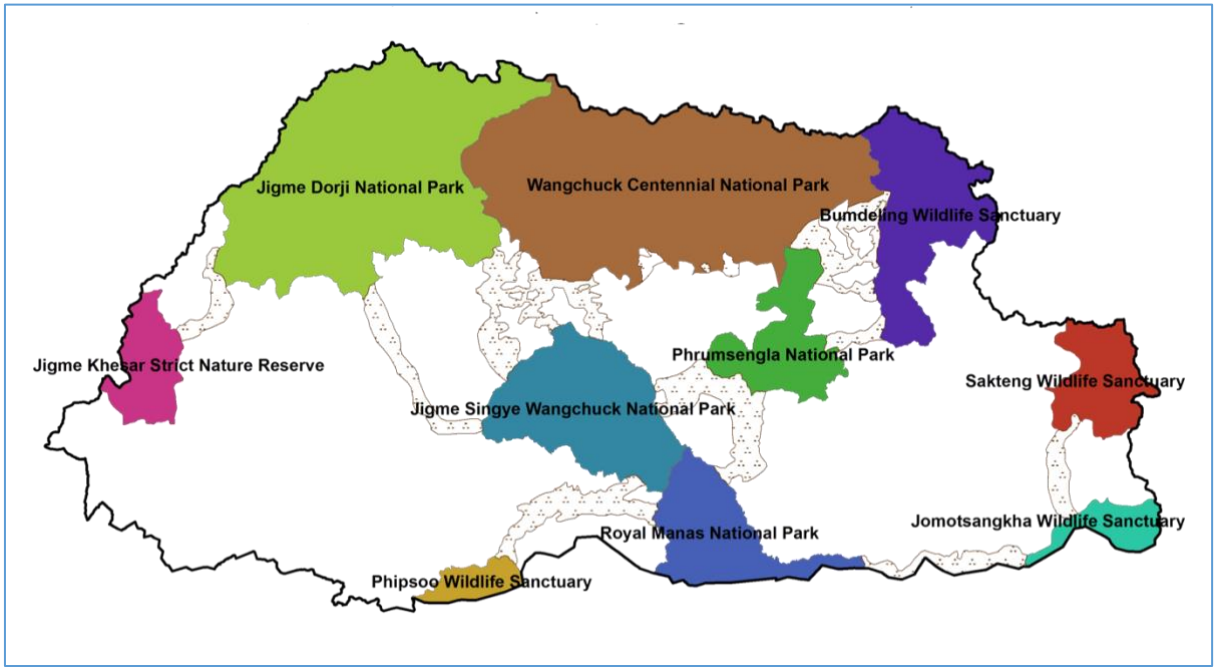

Figure 1 Location of Jomotsangkha Wildlife Sanctuary

The Sanctuary manages Phuntshothang, Pemathang, Samrang, Martshalla under Samdrupcholing Dungkhag and Langchenphug, Serthig and Lauri under Jomotsangkha Dungkhag. As can be seen in Figure 1, the Sanctuary is bordered by Assam to the south, Dewathang gewog to the west, Sakteng Wildlife Sanctuary to the north and Arunachal Pradesh to the east. It lies between 26° 48.26' 60" N (northing), 91°42.92' 08" E (easting). The altitude of the sanctuary ranges from 174 masl to 2228 masl which consist of Sub-tropical Forest, Cool Broadleaved Forest, Warm Broadleaved forest and narrow grasslands spreading along the southern flood plains.

The details of the households in and around the vicinity of the Sanctuary are given in the Table below:

Table 1: Household details under JWS

Sl. No.	Name of Dungkhag	Name of Gewog	H	Hs	Chewog
1	Jomotsangkha	Langchenphu	240		5
2		Lauri	545		5
3		Serthi	365		5
4	Samdrupcholing	Pemathang	301		5
5		Phuntshothang	517		5
6		Samrang	54		5
7		Martshala	504		5

The Sanctuary lies in the Indo-Malayan realm and is known by its wilderness of nature and being habitat to many keystone and flagship species such as tiger, common leopard, elephant and gaur. It is the home to critically endangered species viz. Chinese Pangolin and Lady Slipper. Out of 11 cat species found in the country, 7 species are recorded in the Sanctuary. There are four types of hornbills of Bhutan (Great Hornbill, Oriental Pied Hornbill, Rufous- necked Hornbill and Wreathed Hornbill) with active nesting sites. Also, sanctuary harbors some of the important wildlife species such as Himalayan Black Bear, Gaur, Serow and Sambar among many others.

3. Planned activities in Year 2020

Activities that are planned in JWS in 2020 include the following:

1. Improvement of waterholes and saltlicks

*Waterhole*s: There are several waterholes mapped and found necessary for improvement due to siltation and accumulation of debris over ages. This activity includes removal of debris and silt from the waterhole to make it bigger so that it accumulates enough water for the animals even during dry season. Improvement of waterholes also includes clearing of trails for the wildlife approaching and clearing thick vegetations around the waterholes. Planned implementation dates are October to December 2021. Total activity budget is Nu. 1,50,000 (One Lakh Fifty Thousand only). The area for this activity is 1 hectare covering four waterholes (Sathpokari 2nos, Kherkheria and Laishingri). There will be need of 20 people for one week to carry out the works. Sathpokari (2nos) and Kherkheria have approach road passing by so office shall use light machines to remove the debris to solve the mass involvement of labors which is scares resource and accelerate the progress. There are no settlement or private properties within the area of the activity. The project site is located in the middle of the forest in the prime habitat of the elephants and other wild animals. Labors shall stay in group in temporary shelter (tents) and stay in a safe place to avoid any conflict with the wildlife during the execution of project activity and forestry officials shall also guard the camp.

Figure 2: Removal of debris from Jampani waterhole by machines in 2020

Saltlicks: A mineral lick (also known as a saltlick) is a place where animals can go to lick essential mineral nutrients from a deposit of salts and other minerals. Many animals regularly visit mineral licks to consume clay, supplementing their diet with nutrients and minerals. A recent study found that 12 different species use saltlicks under JWS.

A sum of Nu. 100, 000 (One Lakh only) is allocated to carry out the activity. This is a rehabilitation activity to improve existing salt licks (5 different sites at Samrang Area and 1 site

at Kherkheria) through clearing dead woods, debris, unwanted grasses and clearing trails by removing woods, snags and other hanging over the wildlife passage route. The activity also includes providing salt supplement at the site.

There are no settlement or private properties within the area of the activity. The project site is located in the middle of the forest in the prime habitat of the elephants and other wild animals. Labors shall stay in group in temporary shelter (tents) and stay in a safe place to avoid any conflict with the wildlife during the execution of project activity and forestry officials shall also guard the camp.

The activity is included in the management plan of the JWS, and thus no national clearances were needed for its implementation.

Figure 3: Saltlick after management 2020

Figure 4: Labor camp at saltlick management 2020

For the improvement of waterholes and saltlicks the environmental and social impacts are following:

- *Wastes:* Soil from excavation activities and waste from construction activities and waste generated by workers. Garbage produced by labors will be collected at site and burnt properly to avoid pollution and assimilation by wild animals later.
- *Workers' health and safety*: working gloves will be provided as safety gear.
- Labors will be living in the tent, and have piped water from nearby stream for safe drinking and they will take rations from the town.
- *Increased poaching* as the waterholes will become a hotspot for animals gathering in one site thereby increasing the risk of poaching,
- *Human wildlife conflict* as the area is a prime habitat of elephants.

2. Restoration to enhance quality and resilience of lowland grasslands

Planned implementation dates are January to March 2021. Total activity budget is Nu. 4,99,000 (Four Lakh Ninety Nine Thousand only). The activity seeks to improve the grazing area for wild herbivores. The area is currently covered with unpalatable plants and degrading the quality of grassland by tree species growing in the grassland reducing the open area for growing grasses. The activity will consist of the removal of these plants enhance growth of palatable plants in future. No improved grass seeds shall be sown rather the local species will be encouraged to grow by itself/naturally.

The activity site is located in Sathpokari as extension of same activity in the 2nd year of BFL implementation and in Kherkheria with a total area of 50 hectares. It is located inside mega herbivore elephant prime habitat with abundant water resources. The terrain is characterized by gentle slope to a flat land in the middle of a forest which provides good space to harbor wildlife within the habitat.

No construction materials or any water sources are required for the activity.

Sathpokari: While managing the lowland grasslands, non-palatable plant species mostly those invasive species eg. *Lantana camara, Chromolaena odorata, Pogostemon benghalensis, Ageratina adenophora, Mekania micrantha* will be removed. These species will be removed in winter when they are dried and when there is very dense growth of the species. Control burning will be carried out to suppress the weeds and assist growth of palatable grass. 10 labors for the period of a week will be hired to remove the mentioned weeds and control burn the debris. Labors will be transported by vehicle to the work site from their settlement to avoid any possibility of human wildlife conflict during nights.

Figure 5: Removing of invasive weeds mechanically at Sathpokari grassland 2020

Kherkheria: While managing the lowland grasslands, non-palatable plant species mostly those invasive species eg. *Lantana camara, Chromolaena odorata, Pogostemon benghalensis, Ageratina adenophora, Mekania micrantha* will be removed. It will be managed during winter when they are dried. To encourage to growth of grasses, openings will be created to make the habitat mosaic and 10 snag trees shall be maintained in and around the grass land. Plant debris shall be removed by control burning to suppress the weeds and assist growth of palatable grass. About 20 labors for more than week will be hired and they will camp at the work site in group to avoid danger of wildlife attack. Furthermore, the Park office will send forestry staff to guard them

the labors from possible wildlife confrontation. A fresh stream is located nearby for consumption (cooking, washing and other purposes) during the work. The activity is included in the management plan of the JWS, and thus no national clearances will be needed for its implementation.

For the improvement of lowland grassland which includes removal of unpalatable species, the environmental and social impacts are as follows:

- Change in vegetation by removal of unpalatable plants.
- Risk of forest fires
- Disturbance to the natural habitat such as elephants while using the machinery such as tractors for clearing the thick bushes.

3. Construction of embankment prevent flooding of adjacent area

The eroding bank of Jomo River in the vicinity of Jomotsangkha town have immediate risk on Park Range Office and Shiv Mandir located in the same area. To curb this risk, river bank protection wall was constructed last year from an allocated fund of 0.08m but was not sufficient to complete the entire protection wall. The protection wall was constructed by way of boulder pitching, from the boulders collected from the basin nearby without any disturbance to the grassland.

The rampant occurrence of flash floods on the upper side of existing wall and damaged done by the monsoon rain in the lower side have made the extension of the wall on the either side of the existing wall deemed necessary. Furthermore, damage to the existing wall is suspected during the coming monsoon season therefore, reinforcement will be needed to those portions destroyed by the monsoon floods. Therefore to carry out the activities this year, one Excavator will be hired to execute the work as it involves pitching boulder walls during fourth quarter of 2021. Besides the machine there will no involvement of labors other than forestry staff who will supervise the work. There are government offices (forest), 5 forest staff quarters and Mandhir in the vicinity and whole town in the radius of 1 km from work site. Since the work site is in the river basin there will not be any disturbance to the settlement. Since the river is on the side of grassland even if there are elephants during project activity there won't be any impact to both parties.

The river protection wall includes construction activities of the wall which will have the following adverse impacts:

- *Disturbance of natural aquatic habitat* along the riverbank as there will use of machineries to pick up boulders for the embankment. There will be disturbance of sediments which will affect the aquatic habitat.
- *Occupational health and safety of the workers :* Operator will be provided with safety gloves and ear plugs when working in high pitch noise. Other covid related protocols would also be followed

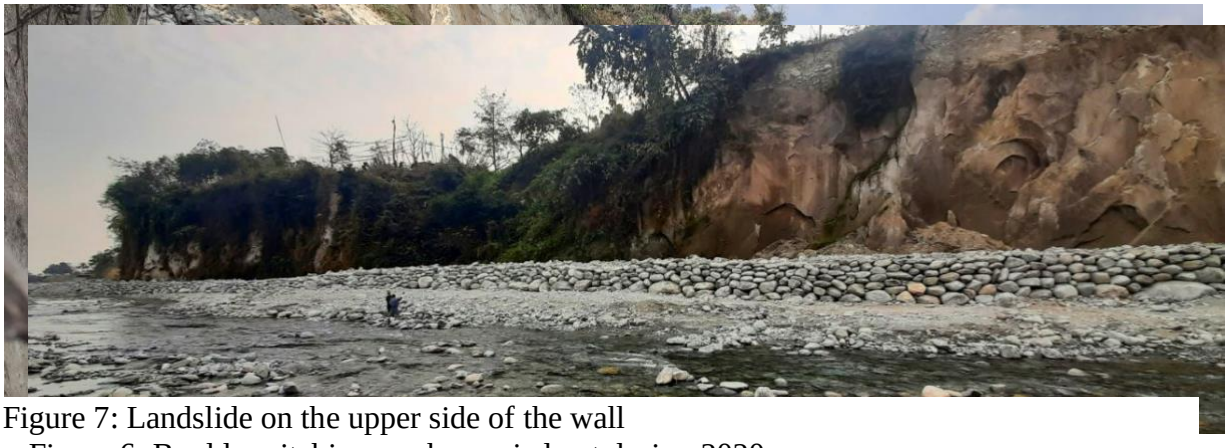

Figure 7: Landslide on the upper side of the wall

Figure 6: Boulder pitching works carried out during 2020

4. Maintenance of Samrang Wildlife Outpost

A watchtower cum transit camp has been built at Samrang located at 24 km from Range Office in Samdrupcholing under JWS. This infrastructure is used while on patrolling and during response to human-elephant conflict. After connecting Samrang-Jomotsangkha road, frequent patrolling is deemed necessary for which this infrastructure would become ever useful. Gewog centre and basic health unit is adjacent to it and there is Samrang mega farm and more than 26HHs of settlement in few km radius.

Unfortunately, the doors and windows of the building was damaged by elephants last summer along with the electric wiring of the infrastructure. Therefore, sum of Nu. 1, 50, 000 (One Lakh fifty Thousand only) is estimated to carry out maintenance of doors, windows and electricitrical wiring which is necessary for the safety of staff while on duty. Activity will be carried out within last quarter of 2021 involving 4 to 7 labors for a period a month. They will stay in the middle floor of the building which is not destroyed and safe, the facility also has water connection for work and consumption.
Maintenance of wildlife Outpost has the following adverse impacts:

- *Wastes*: generation of waste as a result of construction activities such as wires and wood works. As mitigation to it garbage pits (glasses, plastics and Papers) which shall be sustainably used in the future will be dug within the campus.
- *Occupational health and safety*: Labors will stay in a temporary camp connected with drinking water, helmets and gloves shall be provided while working. Covid related protocol will also be followed.

5. **Construction of staff quarter**

The construction shall be carried out by a private contractor through a formal tendering of works with the cost not less than 70, 00,000 (seventy lakhs only). The actual construction works will start from January 2022, however all the paper works like drawing, tendering of works shall be done during 2021.
The proposed site is approximately 1.8 km from Dungkhag Office, Gewog office, schools and Hospital (Bhutan Health Unit-II) and is inside the head office area for convenience. There will be no disturbances to the communities during the construction due to proximity from the community. Nearest town is located about 2km from the construction site and there are two households sparsely located near the construction site which is around 300 m and more than 50 HHs in the radius of 1km. After completion of the infrastructure, staff working in JWS will have privilege to reside in the quarters as there is acute housing problem in the town with high rental charges.

The land on which the structure is built is registered in JWS and office has full authority over it. The site for the project is flat and about 60% of the area has a gentle slope of 5-10%. There are bushes comprising invasive species such as *Lantana camara* and *Chromoleana odorat*a which has to be removed from the site during site development. No trees are there for removal.

For the construction, water will be used from the head office and during summer there are spring water nearby site which can be used for construction purpose. The quantity of water usage would be approximately 1000 litres per day. The solid waste like residual of bricks, iron bars, set cements are likely to be generated during construction. However, the proper disposal of the wastes will be done in close coordination with the contractor. Approximately more than 10 labors will be involved for construction works, and they will live within the construction site at the temporary sheds with separate toilets maintained for sanitary.

The adverse environmental and social impacts for the activity are:

- Vegetation clearing: three trees were cut down for the construction prior to site development.

- Noise disturbance: Possible noise disturbance as a result of outdoor equipment usage such as slab casting machineries and transportation vehicles driving around the construction site, during such labors shall wear ear plugs.
- Waste: generation of waste as a result of construction activities (plastics and other construction materials)
- Occupational health and safety: labors will live in a labor camp nearby the construction site which has safe drinking water connection from office. Helmets shall be made available when working in risky areas and gloves when working with cements. Covid related protocols will be strictly followed to protect the labors from any risk from the virus.

4. Environmental and Social Impacts and Mitigation Measures

Potential impact	Impact scale	Proposed mitigation measures	Responsible party	Costs (1USD=Nu.70.5)
Activity 1: Construction of staff quarter				***USD 99,290***
Vegetation clearing: Clearing of bushes mostly invasive plants like *Lantana camera* and *Chromolaena odorata*	Long term Minor	*During construction:* • Ensure that no accidental damage is caused to any trees or local vegetation. *After construction:* • landscaping around the building planting lawn grasses and flowers	BFL focal person in JWS	30 decimal lands around the building for landscaping. 1. Daily wage: Nu. 500 Labors: 30 man days Costs: Nu 15000 = USD: 215 (ESS Fund) 2. Hire earth moving machines for ground leveling 24 hrs * Nu.2500 = USD: 850 (ESS Fund) 3. Procurement of lawn seeds and ornamental plants USD: 145 (ESS Fund)
Noise disturbance: disturbance a s a result of outdoor equipment usage such as slab casting machineries and transportation vehicles driving around the construction site. Nearest town is located 2km from the construction site and there are two households sparsely located near the construction site (300 m), and thus noise disturbance is likely to be minimal	Short term Minor	*During construction* To minimize the noise disturbance for the workers, the following mitigation measures need to be undertaken: • Noise level control should be performed before the startup of construction activities; • The construction work should not be permitted during the nights, the operations on site shall be restricted to the hours 7am—7pm; • Vehicles that are excessively noisy shall not be operated until corrective measures have been taken and fitness are carried out (contractor to check the fitness certificates of the vehicles); Earplugs and protecting devices shall be provided to workers on site while working with high pitch noise (provided by contractors).	BFL focal person Contractor	To be incorporated in the bidding document from the activity cost
Waste: generation of waste as a	Short term Minor	*During construction* • Identification of the different waste types at the project	BFL focal person Contractor	

result of construction activities (plastics and construction materials)		site (soil, cement, food, plastics etc.); • Proper containers/waste bins should be provided at the project site; • Dumping of wastes on the sides of the road, on private land, or in other non-designated places should be prohibited; • Dumping waste shall be prohibited on fragile slopes, forests, religious or other culturally sensitive areas or areas where livelihood is derived; • Collection, transportation and final disposal of all waste should be undertaken regularly on a weekly basis; • Possible hazardous waste (motor oils, vehicle fuels, etc.) should be collected separately and authorized collector and transporter should be sub-contracted to transport and finally dispose; • All construction materials should be covered during the transportation to avoid waste dispersion; • The options for reuse/recycling of the generated waste streams should be taking into consideration (e.g. excavated soil, etc.). • Burning of construction waste should be prohibited. *After construction:* • All waste shall be removed from the project site.		Waste management after construction: Nu 15000 (ESS funds)
Workers' health and safety including COVID (Refer to the full OHS guidelines attached where ever relevant)	Short term Minor	• Comply with the workers' health and safety guidelines of BFL. • Ensure safety gears and first aid kits to the workers while working. • Ensure that no underage operator, or children are engaged. • Ensure decent work conditions, including an appropriate salary, working hours and food for workers. • Ensure that the workers are employed on the principle of equal opportunity and fair treatment, and there is no discrimination with respect to any aspects of the employment relationship, such as recruitment and hiring, compensation (including wages		To be incorporated in the bidding document from the activity cost

		and benefits), working conditions and terms of employment, termination of employment and disciplinary practices. • Ensure a GRM for the workers are in place. • Strictly abide by COVID prevention protocols (use masks, maintain distance, wash hands regularly etc.)		
Activity 2: Restoration of waterholes and salt licks				**USD 3546.09**
Waste: soil from excavation activities and wastes while debris are removed from the habitat sites	Short term Minor	*During management* • Proper containers/waste bins should be provided at the project site; • Dumping of waste in the waterholes, on the sides of the road, on private land, or in other non-designated places should be strictly prohibited. • Dumping of waste shall be prohibited on fragile slopes, forests, religious or other culturally sensitive areas or areas where livelihood is derived; • Collection, transportation and final disposal of all waste should be carried out on a daily basis and not left in the protected areas *After management* • After the construction of waterholes and saltlicks, all wastes (non-degradable) should be brought back and dumped in a proper designated area. • Burning of any wastes should be prohibited on the site.	BFL focal person Contractor	To be incorporated in activity budget
Workers' health and safety including COVID (Refer to the full OHS guidelines attached where ever relevant)	Short term Minor	• Comply with the workers' health and safety guidelines of BFL. • Ensure safety gears and first aid kits to the workers while working. • Ensure that no underage operator, or children are engaged. • Ensure decent work conditions, including an appropriate salary, working hours and food for workers. • Ensure that the workers are employed on the		To be incorporated in the bidding document from the activity cost

		principle of equal opportunity and fair treatment, and there is no discrimination with respect to any aspects of the employment relationship, such as recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, termination of employment and disciplinary practices. • Ensure a GRM for the workers are in place. • Strictly abide by COVID prevention protocols (use masks, maintain distance, wash hands regularly etc.)		
Increased poaching as the waterhole site will become a hotspot for animals gathering in one site thereby increasing the risk of poaching	Long term Major	• Construct waterholes in areas where poaching is limited • Increase the frequency of patrolling during and after waterhole construction	Staff JWS	Included in regular patrol plans
Human wildlife conflict	Short term Minor	•The workers will be advised to move in groups. •Working hours should be planned seasonal when the elephants and other wild animals migrate to other parts of the forests. •There will be strict working hours (after dawn and before dusk). • Movement shall be prohibited before dawn and after dusk	Forest staff shall guard the group during implementation	Included in the activity budget.
Activity 3: Restoration to enhance quality and resilience of lowland grasslands				**USD 7,078.01**
Change in vegetation: Removal of unpalatable plants (follow habitat management guideline)	Long term Minor	• Ensure that no accidental damage is caused to local vegetation - major trees or plants that are supposed to be cut shall be clearly marked, and only marked trees will be cut; • Only native species will be planted • Notrees should be removed unnecessarily	BFL focal person	To be incorporated in activity budget
Risk of forest fire	Short term Minor	• Burning of trees and other plants should be avoided and if necessary, burning should be carried out in a controlled manner avoiding dry and windy times of the day. • Control burning to be carried out by making fire line.	Activity focal	To be incorporated in activity budget
Disturbance to the natural habitat such as	Short term Minor	• Ensure careful siting and timing of works (seasonal	Activity focal	NA

elephants while using the machinery such as tractors for clearing the thick bushes.		when elephants migrate to other parts). • Avoid using heavy machinery. • Avoid soil excavation and noise disturbance to minimize impact on natural habitats		
Activity 4: Construction of embankment prevent flooding of adjacent area				**USD 8510.63**
Disturbance of natural aquatic habitat along the river bank	Long term Major	• Ensure careful sitting, alignment, design of construction sites, and/or timing of works (to be planned in winter or spring when the flow is low) • Avoid marching of machines on the bed and avoid excavating the river bed materials for construction. After completion river water will follow through same drainage basin and there will not be permanent damage to the aquatic life	BFL focal person Contractor	To be incorporated in bidding document
Workers' health and safety including COVID (Refer to the full OHS guidelines attached where ever relevant)	Short term Minor	• Comply with the workers' health and safety guidelines of BFL. • Ensure safety gears and first aid kits to the workers while working. • Ensure that no underage operator, or children are engaged. • Ensure decent work conditions, including an appropriate salary, working hours and food for workers. • Ensure that the workers are employed on the principle of equal opportunity and fair treatment, and there is no discrimination with respect to any aspects of the employment relationship, such as recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, termination of employment and disciplinary practices. • Ensure a GRM for the workers are in place. Strictly abide by COVID prevention protocols (use masks, maintain distance, wash hands regularly etc.)		To be incorporated in the bidding document from the activity cost
Activity 5: Maintenance of Samrang wildlife Outpost				***USD 2127.65***
Wastes:	Short term Minor	*Pre-maintenance:* • requirements for appropriate waste management should be	BFL focal person	Included in the bidding documents from

Generation of waste as a result of construction activities such as old wires, glasses and woods.		included and made aware to the local workers *During maintenance:* Identification of the different waste types at the site (woods, wires, food, etc.); • Proper containers/waste bins should be provided at the site; • Dumping of waste on the sides of the road, on private land, or in other non- designated places should be prohibited. • Dumping waste shall be prohibited on fragile slopes, forests, religious or other culturally sensitive areas or areas where livelihood is derived; • Collection, transportation and final disposal of all waste should be undertaken regularly [weekly] • Possible hazardous waste such as glasses and old iron should be collected separately and authorized collector and transporter should be sub-contracted to transport and finally dispose; • The options for reuse/recycling of the generate waste streams should be taking into consideration (e.g. excavated soil, etc.). • Burning of construction waste should be prohibited. • Digging dust bin pit in the campus. *After maintenance:* All wastes shall be removed from the site.		the activity budget Digging dust bin pits (2 pits) Plastics and glasses Nu 30000 (ESS Funds)
Workers' health and safety including COVID (Refer to the full OHS guidelines attached where ever relevant)	Short term Minor	• Comply with the workers' health and safety guidelines of BFL. • Ensure safety gears and first aid kits to the workers while working. • Ensure that no underage operator, or children are engaged. • Ensure decent work conditions, including an appropriate salary, working hours and food for workers. • Ensure that the workers are employed on the		To be incorporated in the bidding document from the activity cost

		principle of equal opportunity and fair treatment, and there is no discrimination with respect to any aspects of the employment relationship, such as recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, termination of employment and disciplinary practices. • Ensure a GRM for the workers are in place. Strictly abide by COVID prevention protocols (use masks, maintain distance, wash hands regularly etc.)		

5. ESMP Implementation Arrangements

The implementation of project activities will be carried out by the BFL focal person in JWS.
The focal person will be responsible for compliance with all procedures outlined in this ESMP, as well as compliance with any requirements to obtain clearances, permits, approvals, or consent documents from relevant authorities and stakeholders.

This ESMP should be part of the contract that the PA will sign with the Contractor(s) for implementation of the planned activities in JWS in 2020. The Contractor is obligated to perform all proposed preventive or mitigation environmental and social measures in this plan and to keep the evidence of any documents related to applying these measures (e.g., letter asking the municipality for disposal of inert waste, records on OHS information session performed for all workers before start of activities, all developed EHS plans, etc.). An OHS information session should be organized by the Contractor for all workers prior start the project activities and prior any specific tasks with high health risks.

The JWS's Supervising Engineer needs to monitor the implementation of proposed measures by the Contractor and Contractor's subcontractors with visual checking, reviewing the records of evidence that the measures have been applied and ask the Contractor to apply the measures as soon as possible. Non-compliances should be recorded and the Report on any non-compliances should be reported to the ESS officer immediately, and the ESS officer will report it to the PCU (M&E Officer). Every non-compliance should be closed with appropriate measure/s and the evidence should be kept.

Disbursement of project funds to the PA will be contingent upon their full compliance with the safeguard's requirements.

6. ESMP Monitoring Arrangements

The BFL focal person in JWS will closely monitor the implementation of all planned activities and the required mitigation measures, and ensure that they fully comply with this ESMP and with the terms and conditions included in the environment clearances issued by RGoB's national authorities.

JWS's PA is also fully responsible for the compliance of all external contractors and service providers working in the JWS with the safeguard's requirements outlined in the ESMP.

The monitoring of activities under this ESMP will be carried out in the following manner:

Sl.No	Activities	Monitoring team	Timeline		Location	Means of Verification
1	**Construction of Staff quarter**					
			Start	Complete		
		Field focal	Twice monthly: January 2022	December 2022	Langchenphu, JWS	Physical site visit and through performance reports submitted semi annually
		ESS officer	March, 2022			
2	**Restoration to enhance quality and resilience of lowland grasslands**					
		Field focal	March 2021	May 2021	Sathpokori and Kherkheria	Physically and through field completion report by implementing range offices and half year performance report.
		ESS officer	3rd week may, 2021			
3	**Improvement of water holes and salt licks**					
		Field focal	Oct 2021	Dec 2021	Sathpokari, Kherkheria and Layshingri	Physically once during implementation and through completion reports from implementing range offices and annual performance reports.
		ESS officer	2nd week Nov, 2021			
4	**Construction of embankment prevent flooding of adjacent area**					
		Field focal	Oct 2021	Dec 2021	Jomo river	Shall supervise the work and through annual performance reports.
		ESS officer	1st week Dec, 2021			
5	**Maintenance of Samrang wildlife Outpost**					

		Field Focal	April 2021	June 2021	Samrang	Physically during maintenance works and through completion report from Samdrupcholing range office and half year performance reports
		ESS officer	3rd week, May			

JWS falls under high-risk zone and movement of people and vehicles for and to high-risk area is restricted. Therefore, physical monitoring of the activities by ESS officer is not possible as of now. If the situation improves, physical monitoring for the construction work will be carried out as per the schedule given above

1. Construction of Staff quarter

Monitoring by implementing entities:

a. At least weekly field visits

b. Monthly reports prepared by implementing entities and submitted to ESS officer

Monitoring by ESS officer:

c. Field monitoring by ESS officer – monitoring of the work once during the implementation and through field report from IAs after completion of the work.

d. Reports by ESS officer to BFL Fund Secretariat – Annual report submitted to the BFL Fund Secretariat in January, 2022.

Bi-annual reports of the Secretariat to WWF US (as part of mid-year and final APRs)

2. Restoration to enhance quality and resilience of lowland grasslands

- Monitoring by implementing entities:
    - Field visits at least twice—during the intervention and within three months after the intervention
    - Reports by the implementing entities submitted to ESS officer within a week after each field visit
- Monitoring by ESS officer at PCU:
    - Field monitoring by ESS officer –monitoring through photographic/video evidence submitted by the IAs during the implementation as per the given dateline in the table above.
    - Reports by ESS officer to BFL Fund Secretariat – Annual report submitted to the BFL Fund Secretariat in January, 2022.
- Bi-annual reports of the Secretariat to WWF US (as part of mid-year and final APRs)

3. Improvement of water holes and salt licks

- Monitoring by implementing entities:
    - Field visits at least twice—during the intervention and then monthly as part of the "SMART patrolling" activity (will be adapted based on field conditions, and also based on the availability of SMART patrolling activities).
    - Reports by the implementing entities submitted to ESS officer once during the intervention and once after the completion of work.
- Monitoring by ESS officer at PCU:
    - Field monitoring by ESS officer –monitoring through photographic/video evidence submitted by the IAs during the implementation as per the given dateline in the table above.
    - Reports by ESS officer to BFL Fund Secretariat – Annual report submitted to the BFL Fund Secretariat in January, 2022.
- Bi-annual reports of the Secretariat to WWF US (as part of mid-year and final APRs)

4. Construction of embankment prevent flooding of adjacent area

Monitoring by implementing entities:

- Field visits—at least weekly
- Monthly reports by the implementing entities submitted to ESS officer

Monitoring by ESS officer at PCU:

- Field monitoring by ESS officer – monitoring through photographic/video evidence submitted by the IAs during the implementation as per the given dateline in the table above.
- Reports by ESS officer to BFL Fund Secretariat – Annual report submitted to the BFL Fund Secretariat in January, 2022.

Bi-annual reports of the Secretariat to WWF US (as part of mid-year and final APRs)

5. Maintenance of Samrang wildlife Outpost

- Monitoring by implementing entities:
    - At least weekly field visits

- Monthly reports prepared by implementing entities and submitted to ESS officer

- Monitoring by ESS officer:
  - Field monitoring by ESS officer – monitoring through photographic/video evidence submitted by the IAs during the implementation as per the given dateline in the table above.
  - Reports by ESS officer to BFL Fund Secretariat – Annual report submitted to the BFL Fund Secretariat in January, 2022.

Bi-annual reports of the Secretariat to WWF US (as part of mid-year and final APR

7. Capacity Need and Budget

Activities under this ESMP will be implemented by the implementing staff of two range offices in collaboration with BFL focal person, supervising engineer, and a contractor that will employ workers as mentioned in the contract agreement. The budget for each of the activities is:

1. Construction of the Staff quarter is: USD 99290.78
2. Improvement of waterholes: USD 2127.65
3. Improvement of salt licks: USD 1418.43
3. Restoration of lowland grassland: USD 7,078.01
4. River protection wall: USD 8510.63
5. Maintenance of wildlife outpost Samrang: USD 2127.65

A separate budget of **USD 3330** will cover the implementation of the ESMP mitigation measures from ESS Fund.

8. Consultation and Disclosure Mechanisms

This ESMP has been prepared in a participatory manner, and a community consultation was carried out for the construction boulder wall to protect the river bank erosion October 2021 to inform local communities regarding the planned project activities, solicit their opinions, and enable them to question proposed mitigation measures. The main issues that were raised during the consultation meeting include the following:

- The agenda for the consultation shall be to get the feed backs from the previous year's wall and how to go about the current year's work.

The detailed minutes of the consultation meeting will be recorded along with a full list of participants (disaggregated by gender and age). For other habitat management works (improvement of waterhole, saltlick and grassland) there will not be public consultation as the sites are deep inside the forest and this will increase the risk of poaching activities in the managed habitats if we disclose the locations to general public.

The full English version of this ESMP, as well as an executive summary in Bhutanese, shall be disclosed on the website of MoAF and WWF, Bhutan Program. Hard copies of the ESMP should also be available at the PA Management Office and at the PCU Office.

9. Stakeholder Engagement Plan

The local community that resides in the vicinity of the planned BFL activities in JWS will be engaged throughout the implementation of these activities. Focused section of local people will be informed to work in the management activities and this is not to disclose the

location of active wildlife sites in the park and prevent poaching activities in the future. Community groups shall visit the wall construction sites and share their concerns and it will be reported in the BFL focal monitoring reports. Any consultation meetings minutes shall be maintained for reference.

2. Consultations carried out with the communities for river embankment

Date: 1 Oct 2021, Agenda: The local leader and communities have been consulted for this activity and consent for carrying out the activity.

For other activities looking to the necessities of the consultation JWS will carry out community consultation before the activities are implemented to get feedback regarding the activities before implementing it. The detailed minutes of the consultation meeting will be attached to this ESMP, along with a full list of participants (disaggregated by gender and age).

The BFL focal person has to submit the official minutes of consultation meetings (along with a list of participants, disaggregated by gender and age) to ESS officer within one week after the completion of the consultation. The ESS officer will submit the consultation reports to the PCU (M&E officer) one week after their receipt. The PCU (M&E officer) will report to the Secretariat on a semi-annual basis.

Annexure . BFL: SUGGESTED OCCUPATIONAL HEALTH AND SAFETY STANDARDS

Employers and supervisors are obliged to implement all reasonable precautions to protect the health and safety of workers. Implementing entities should hire contractors that have the technical capability to manage the occupational health and safety issues of their workers, extending the application of the hazard management activities through formal procurement agreements.

This section provides guidance and examples of reasonable precautions to implement in managing principal risks to occupational health and safety. It is based on the IFC's Environmental, Health, and Safety Guidelines (April 30, 2007)[1] and the Occupational Health and Safety Guidelines of Bhutan's Construction Development Corporation Ltd., which relies on the national Regulation on Occupational Health, Safety and Welfare 2012, Regulation on Working Conditions 2012 and Labour Act 2007, and in compliance to Sl. No. 21 of Regulation on Occupational Health, Safety and Welfare 2012.

1. General Facility Design and Operation

Integrity of Workplace Structures

Permanent and recurrent places of work should be designed and equipped to protect occupational health and safety:

- 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.
- Heavy oscillating, rotating or alternating equipment should be located in dedicated buildings or structurally isolated sections.

Severe Weather and Facility Shutdown

- Workplace structures should be designed and constructed to withstand the expected elements for the region and have an area designated for safe refuge (e.g., in case of earthquake).

Workspace and Exit

- The space provided for each worker, and in total, should be adequate for safe execution of all activities, including transport and interim storage of materials and products.

Fire Precautions

The workplace should be designed to prevent the start of fires through the implementation of fire codes applicable to industrial settings. Other essential measures include:

- The workplace shall be provided with adequate means of protection and escape in case of fire.
- The workplace shall be provided with adequate number of relevant fire extinguishers.
- Workers shall wear shoes without iron or steel nails or any other exposed ferrous materials which is likely to cause sparks by friction.
- Smoking, lightening, or carrying of matches, lighters or smoking materials shall be prohibited.
- All other precautions, as are reasonably practicable, shall be taken to prevent initiation of ignition from all other possible sources such as open flames, frictional sparks, overheated surfaces of machinery or plant, chemical or physical, chemical reaction and radiant heat.
- At every workplace adequate provision of water supply for firefighting shall be provided and maintained.
- Equipping facilities with firefighting equipment (e.g., fire extinguishing bottle). 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.
- Manual firefighting equipment shall be easily accessible and simple to use.
- Fire extinguishers and emergency alarm systems that are both audible and visible should be in place.

Lavatories and Showers

- Adequate lavatory facilities (toilets and washing areas) should be provided for the number of people expected to work in the facility (at least one for every 20 workers). Toilet facilities should also be provided with adequate supplies of hot and cold running water and soap.

Potable Water Supply

- Adequate supplies of potable drinking water should be provided to workers at the work site.

Clean Eating Area

- Where there is potential for exposure to substances poisonous by ingestion, suitable arrangements are to be made for provision of clean eating areas where workers are not exposed to the hazardous or noxious substances.

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 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.
- 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

- The employer should ensure that qualified first-aid can be provided at all times. A sufficient number of first aid boxes or cupboards shall be provided and maintained so as to be readily available during all working hours, provided that the distance of the nearest first aid box or a cupboard stall be not more than 200m from any working place.
- First aid kits include all equipment outlined in Annex 1 to these Guidelines.
- 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.

Work Uniform

- The contractor shall provide a working uniform to each worker.
- All workers shall be required to attend the duty in proper uniform unless otherwise instructed by the Contractor.

Air Supply

- Sufficient fresh air should be supplied for indoor and confined workspaces. 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.
- Re-circulation of contaminated air is not acceptable. Heating, ventilation and air conditioning (HVAC) systems should be equipped, maintained and operated so as to prevent growth and spreading of disease agents (e.g. Legionnella pneumophilia) or breeding of vectors (e.g. mosquitoes and flies) of public health concern.

2. <u>Information Provision on</u> Occupational Health and Safety (OHS)

- The Contractor is responsible to hold an information session to familiarize all workers with the OHS procedures specified in these guidelines, in order 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.
- The information session 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.

3. <u>Physical Hazards</u>

Physical hazards represent potential for accident or injury or illness due to repetitive exposure to mechanical action or work activity.

Rotating and Moving Equipment

Injury or death can occur from being trapped, entangled, or struck by machinery parts due to unexpected starting of equipment or unobvious movement during operations. Recommended

protective measures include:

- Designing machines to eliminate trap hazards and ensuring that extremities are kept out of harm's way under normal operating conditions. Examples of proper design considerations include two-hand operated machines to prevent amputations or the availability of emergency stops dedicated to the machine and placed in strategic locations.
- Where a machine or equipment has an exposed moving part or exposed pinch point that may endanger the safety of any worker, the machine or equipment should be equipped with, and protected by, a guard or other device that prevents access to the moving part or pinch point. Guards should be designed and installed in conformance with appropriate machine safety standards.

Noise

- No worker 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).
- The 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).
- Although hearing protection is preferred for any period of noise exposure in excess of 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.
- Periodic medical hearing checks should be performed on workers exposed to high noise levels.

Vibration

Exposure to hand-arm vibration from equipment such as hand and power tools, or whole-body vibrations from surfaces on which the worker stands or sits, should be controlled through choice of equipment, installation of vibration dampening pads or devices, and limiting the duration of exposure.

Electrical

Exposed or faulty electrical devices, such as circuit breakers, panels, cables, cords and hand tools, can pose a serious risk to workers. Overhead wires can be struck by metal devices, such as poles or ladders, and by vehicles with metal booms. Vehicles or grounded metal objects brought into close proximity with overhead wires can result in arcing between the wires and the object, without actual contact. Recommended actions include:

- Marking all energized electrical devices and lines with warning signs
- Locking out (de-charging and leaving open with a controlled locking device) and tagging-out (warning sign placed on the lock) devices during service or maintenance
- 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

- Double insulating / grounding all electrical equipment used in environments that are, or may become, wet; using equipment with ground fault interrupter (GFI) protected circuits
- Protecting power cords and extension cords against damage from traffic by shielding or suspending above traffic areas
- Appropriate labeling of service rooms housing high voltage equipment ('electrical hazard') and where entry is controlled or prohibited
- Establishing "No Approach" zones around or under high voltage power lines
- Rubber tired construction or other vehicles that come into direct contact with, or arcing between, high voltage wires may need to be taken out of service for periods of 48 hours and have the tires replaced to prevent catastrophic tire and wheel assembly failure, potentially causing serious injury or death
- Conducting detailed identification and marking of all buried electrical wiring prior to any excavation work

Eye Hazards

Solid particles from a wide variety of industrial operations, and/or a liquid chemical spray may strike a worker in the eye causing an eye injury or permanent blindness. Recommended measures include:

- Use of machine guards or splash shields and/or face and eye protection devices, such as safety glasses with side shields, goggles, and/or a full-face shield. Frequent checks of these types of equipment prior to use to ensure mechanical integrity is also good practice.
- Where machine or work fragments could present a hazard to transient workers or passers-by, extra area guarding or proximity restricting systems should be implemented, or PPE required for transients and visitors.
- Provisions should be made for persons who have to wear prescription glasses either through the use overglasses or prescription hardened glasses.

Welding / Hot Work

Welding creates an extremely bright and intense light that may seriously injure a worker's eyesight. In extreme cases, blindness may result. Additionally, welding may produce noxious fumes to which prolonged exposure can cause serious chronic diseases. Recommended measures include:

- Provision of proper eye protection such as welder goggles and/or a full-face eye shield for all personnel involved in, or assisting, welding operations. Additional methods may include the use of welding barrier screens around the specific work station (a solid piece of light metal, canvas, or plywood designed to block welding light from others). Devices to extract and remove noxious fumes at the source may also be required.

Working Environment Temperature

Exposure to hot or cold working conditions in indoor or outdoor environments can result temperature stress-related injury or death. Use of personal protective equipment (PPE) to protect against other occupational hazards can accentuate and aggravate heat-related illnesses. Extreme temperatures in permanent work environments should be avoided through implementation of engineering controls and ventilation. Where this is not possible, such as during short-term outdoor work, temperature-related stress management procedures should be implemented which include:

- Monitoring weather forecasts for outdoor work to provide advance warning of extreme weather and scheduling work accordingly
- Providing temporary shelters to protect against the elements during working activities or for use as rest areas
- Use of protective clothing
- Providing easy access to adequate hydration such as drinking water or electrolyte drinks, and avoiding consumption of alcoholic beverages

Ergonomics, Repetitive Motion, Manual Handling

Injuries due to ergonomic factors, such as repetitive motion, overexertion, and manual handling, take prolonged and repeated exposures to develop, and typically require periods of weeks to months for recovery. These OHS problems should be minimized or eliminated to maintain a productive workplace. Controls may include:

- Facility and workstation design with 5th to 95th percentile operational and maintenance workers in mind
- Use of mechanical assists to eliminate or reduce exertions required to lift materials, hold tools and work objects, and requiring multi-person lifts if weights exceed thresholds
- Selecting and designing tools that reduce force requirements and holding times, and improve postures
- Incorporating rest and stretch breaks into work processes, and conducting job rotation
- Implementing quality control and maintenance programs that reduce unnecessary forces and exertions

Working at Heights

Fall prevention and protection measures should be implemented whenever a worker is exposed to the hazard of falling more than two meters; into operating machinery; into water or other liquid; into hazardous substances; or through an opening in a work surface. Fall prevention / protection measures may also be warranted on a case-specific basis when there are risks of falling from lesser heights. Fall prevention may include:

- Installation of guardrails with mid-rails and toe boards at the edge of any fall hazard area
- Proper use of ladders and scaffolds by trained workers
- Use of fall prevention devices, including 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 life-lines
- Appropriate training in use, serviceability, and integrity of the necessary PPE
- Inclusion of rescue and/or recovery plans, and equipment to respond to workers after an arrested fall

Illumination

Work area light intensity should be adequate for the general purpose of the location and type of activity, and should be supplemented with dedicated work station illumination, as needed. Controls should include:

- Use of energy efficient light sources with minimum heat emission
- Undertaking measures to eliminate glare / reflections and flickering of lights
- Taking precautions to minimize and control optical radiation including direct sunlight.
- Exposure to high intensity UV and IR radiation and high intensity visible light should also be controlled
- Controlling laser hazards in accordance with equipment specifications, certifications, and recognized safety standards. The lowest feasible class Laser should be applied to minimize risks.

4. Personal safety equipment for workers

All workers are equipped with the following personal safety equipment: helmet, gloves, ordinary boots and reflective vest.

Workers that are exposed to dust should also be provided with eye protection glasses and face mask. Workers that are exposed to noise should be provided with ear plugs. Workers that need to work in the dark should be provided with hand and cap lamps.

Workers are instructed regarding safety equipment as follows:

- Always wear complete set of protective wear.
- Do not wear loose clothing, such as overhang shirt, jackets, mufflers etc.
- Tuck shirt and jacket well.
- Secure helmet with belt under the chin.
- Tuck the bottom sleeves of trouser inside safety boot.
- Dress with reflector

5. Standards for workers' accommodation[2]

1. General living facilities

- The location of the facilities is designed to avoid flooding or other natural hazards
- The living facilities are located within a reasonable distance from the worksite.
- Transport is provided to worksite safe and free.
- The living facilities are built using adequate materials, kept in good repair and kept clean and free from rubbish and other refuse.

2. Drainage

- The site is adequately drained.

3. Heating, air conditioning, ventilation and light

- Living facilities are provided with adequate heating, ventilation, and light systems including emergency lighting.

4. Water

- Workers have easy access to a supply of clean/ potable water in adequate quantities.
- The quality of the water complies with national/local requirements or WHO standards.
- Tanks used for the storage of drinking water are constructed and covered to prevent water stored therein from becoming polluted or contaminated.
- The quality of the drinking water is regularly monitored.

5. Wastewater and solid waste

- Wastewater, sewage, food and any other waste materials are adequately discharged in compliance with national and/or international standards and without causing any significant impacts on camp residents, the environment or surrounding communities.
- Specific containers for rubbish collection are provided and emptied on a regular basis.
- Pest extermination, vector control and disinfection are undertaken throughout the living facilities at least once.

6. Rooms/dormitories facilities

- Rooms/dormitories are kept in good condition.
- Rooms/dormitories are aired and cleaned at regular intervals.
- Rooms/dormitories are built with easily cleanable flooring material.
- Rooms/dormitories and sanitary facilities are located in the same buildings.
- Residents are provided with enough space.

- The number of workers sharing the same room/dormitory is minimized.
- Doors and windows are lockable and provided with mosquito screens when necessary.
- Mobile partitions or curtains are provided.
- Adequate number of furniture such as table, chair, mirror, and lamps are provided for all workers.
- Separate sleeping areas are provided for men and women.

7. Bed arrangements and storage facilities

- A separate bed is provided for every worker.
- The practice of "hot-bedding" is prohibited.
- There is a minimum space of 1 meter between beds.
- The use of double deck bunks is minimized.
- If double deck bunks are in use, there is enough clear space between the lower and upper bunk of the bed.
- Workers are provided with comfortable mattresses. Workers may be expected to use their own pillows and bed linens.
- Workers wash bed linen frequently and applied with adequate repellents and disinfectants (where conditions warrant).
- Adequate facilities for the storage of personal belongings are provided.
- Separate storages for work clothes and PPE and depending on condition, drying/airing areas are provided.

8. Sanitary and toilet facilities

- Sanitary and toilet facilities are constructed from materials that are easily cleanable.
- Sanitary and toilet facilities are cleaned frequently and kept in working condition.
- Toilets, showers/bathrooms and other sanitary facilities are designed to provide workers with adequate privacy including ceiling to floor partitions and lockable doors.
- Separate sanitary and toilet facilities are provided for men and women.
- Toilet facilities are conveniently located and easily accessible.
- Toilet facilities are environmentally friendly (e.g., pit toilet) and sewage is not disposed into the worksite.
- Open defecation in the vicinity of project sites should be prohibited.
- An adequate number of hand wash basins and showers/bathrooms facilities are provided.
- Shower facilities are provided with water heating facilities.

9. Cooking and laundry facilities

Cooking and laundry facilities should available for workers at the worksite or in close vicinity to it. These facilities should be kept in clean and sanitary conditions.

10. Leisure, social and telecommunications facilities

- Basic social collective spaces should be available to workers.
- Workers are provided with dedicated places for religious observance, as appropriate.
- The employer provides workers with local sim cards that can be used for communication on their personal cell phones.

Contents of first aid box or cup-boards

The first aid boxes or cup-boards shall be distinctively marked with white cross on a green background and shall contain the following equipment:

1. Small sterilized dressings (12)
2. Medium size sterilized dressings (6)
3. Large size sterilized dressings (6)
4. Large size sterilized burn dressings (6)
5. (1/2 oz.) Sterilized cotton wool (6 packets)
6. (2oz.) Bottle containing a two per cent alcoholic solution of iodine (1)
7. (2oz.) Bottle containing Betadine (antiseptic solution) having the dose and mode of administration indicated on the label (1)
8. Roll of adhesive plaster (1)
9. A snake bite lancet (1)
10. Torch light (1)
11. Pair of scissors (1)
12. Tablets Aspirin (5gms) 2 dozen
13. Burn Ointment (2 tubes)
14. Dettol (2 phial, about 2 ozs)
15. Bandages 4 inches wide
16. Bandages 2 inches wide
17. Triangular bandages (2)
18. Packets of safety pins (1)
19. A supply of suitable splint