



REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES PROJECT

Site Specific Environmental and Social Management Plan

Site No.145

**Between Diyathalawa (156/54) and Bandarawela (160/36) stations
at Ch 160/00 - 160/22
Badulla District**

November 2020

Prepared for:



**ASIAN INFRASTRUCTURE
INVESTMENT BANK**

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Abbreviations

AIIB	Asian Infrastructure Investment Bank
CEA	Central Environmental Authority
CEB	Ceylon Electricity Board
DFC	Department of Forest Conservation
DS	Divisional Secretary
DWLC	Department of Wild Life Conservation
EH & S	Environmental Health & Social
E&SU of PMU	Environmental & Social Unit of Project Management Unit
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
GN	Grama Niladhari
GOSL	Government of Sri Lanka
GSMB	Geological Surveys & Mines Bureau
LHS	Left Hand Side
NBRO	National Building Research Organization
RDA	Road Development Authority
RHS	Right Hand Side
SSE & SMP	Site Specific Environmental and Social Management Plan

1. INTRODUCTION

1.1. Project Overview

The Government of Sri Lanka has obtained a loan from the Asian Infrastructure Investment Bank (AIIB) for mitigating/rectifying unstable slopes in high risk areas especially in 11 districts of 06 provinces of the country. The project requires to be implemented in accordance with environmental and social safeguards and mandates of the AIIB and that of Sri Lanka. Considering the nature of project actions and its implementation, an environmental and social management framework (ESMF) has been prepared as required by the AIIB environmental and social safeguard policy.

The purpose of the environmental and social management framework (ESMF) is to provide a guide for application of AIIB safeguards and national environmental and social mandates during the implementation of project actions. The project implementing agency (NBRO) is expected to ensure implementation of environmental and social management plans prepared under the ESMF during all phases of project implementation so that the impacts on the environment and community are minimum.

During the scoping exercise it was revealed that the environmental & social setting, and health & safety conditions are more site specific, and require to be addressed specific to site conditions. Therefore, the ESMF has recommended a site specific environmental and social assessments followed by Site Specific Environmental and Social Management Plans (SSE&SMP) for each site. The SSE&SMP gives planning, design, construction and operation phase environmental, social, and health & safety management measures to be considered in the project Implementation.

This is the site specific environmental and social management plan for **Between Diyathalawa (156/54) and Bandarawela (160/36) stations at Ch 160/00 - 160/22** cutting failure mitigation site. This plan has been prepared by an in-depth environmental and social assessment to:

- i. Identify sensitive environmental and social elements in the project influence area
- ii. Identify significant environmental and social impacts due to project actions
- iii. Propose mitigation measures
- iv. Decide appropriate environmental and social monitoring requirements specific to this project
- v. Study relevant environmental regulations and procedures to be followed during project implementation specific to the site

1.2. Intended Users

The document provides an in-depth insight into site specific environmental and social issues associated with the proposed project and the mitigation measures and intend to be used by landslide mitigation design team, the PMU and the contractor in the implementation of ESMP component of the project. The SSE&SMP is published in NBRO website and can be viewed by wide range of interested parties (public, stakeholder organizations) can be utilized by the contractors for the project and will form the basis of site-specific management plans that will be prepared by the contractors as part of their Site Specific Environmental and Social Management Action Plans (SS- ESMAP) prior to commencing works.

2. DESCRIPTION OF THE PROJECT AND SITE DESCRIPTION

2.1. Name of the Site

Rectification of Site No.145, between Diyathalawa (156/54) and Bandarawela (160/36) stations at Ch 160/00 - 160/22, Bandarawela, Badulla District

2.2. Locational Details

The proposed mitigation site falls under Inikambedda GN division of Bandarawela DS division in Badulla District, Uva Province.

GPS References of the site – 6.8245°N and 80.9851°E

Elevation – The elevation of the location is around 4050ft (1235m) AMSL. It is located closer to the Bandarawela railway station.

Nearest Town to the Site – The mitigation site is located very closer to the Bandarawela town.

Accessibility to the Location –

The Bandarawela railway station is located very closer to the mitigation area and the distance to the Bandarawela railway station from Colombo fort is 258 km through main railway line.

The mitigation site can be accessed from the Colombo-Badulla (A16) road. Bandarawela town can be accessed by this road in 200km from the Colombo and the mitigation site is located around 500m from the Bandarawela town center.

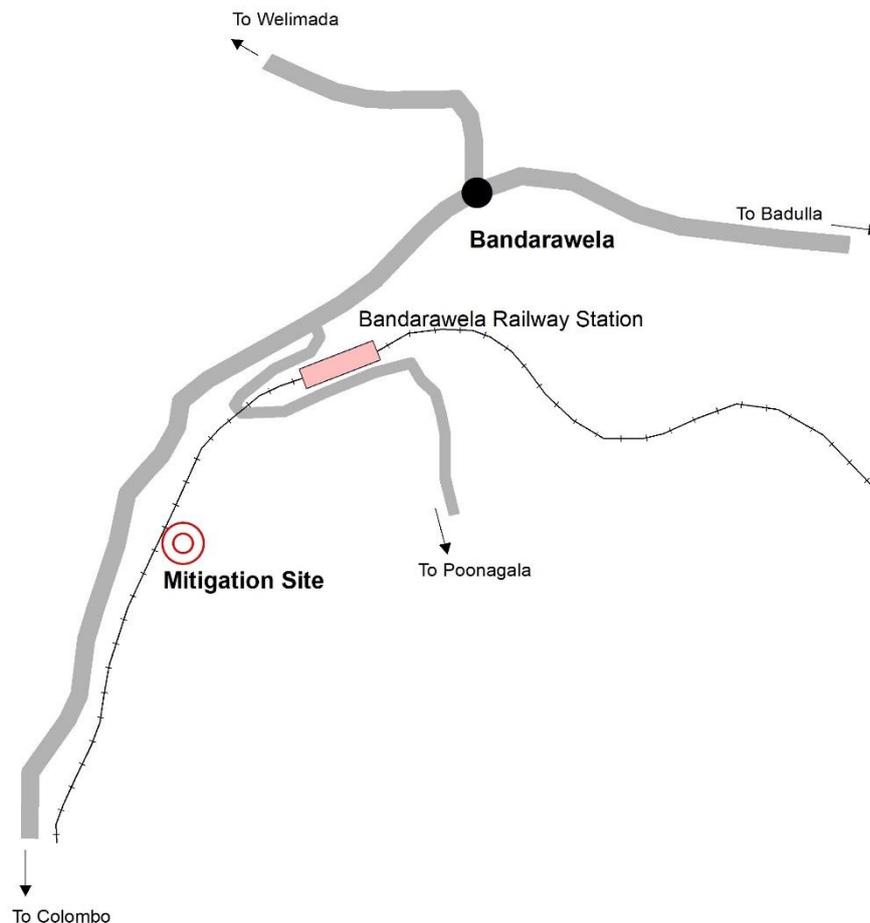


Figure 1- Accessibility to the Mitigation Location

2.3. Topography and Land Ownership

The proposed mitigation site is located closer to the Bandarawela railway station. The railway line is located in a hilly terrain where the natural slope is disturbed and modified several of terraces to gain space for construction of building, road and railway line.

The extent of the land area of the mitigation area is about 1500m².

The land ownership is the Railway Department of Sri Lanka and the reservation of the railway line has been used for tenants but the land ownership is the Railway Department.



Figure 2 – Google image of the proposed landslide mitigation location

2.4. Meteorology of the area

The Bandarawela lies on 1220m above sea level and therefore has a tropical climate. Most months of the year are marked by significant rainfall. The average annual temperature in Bandarawela is 20.3 °C | 68.5 °F. The rainfall here is around 1700 mm | 66.9 inch per year. The driest month is June, with 37 mm | 1.5 inch of rainfall. The greatest amount of precipitation occurs in November, with an average of 270 mm | 10.6 inch.

	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temperature (°C)	18.4	19	20.1	20.9	21.5	21.5	21.2	21.1	20.9	20.2	19.6	18.8
Min. Temperature (°C)	14.7	14.7	14.5	15	17.2	17.2	17.1	16.9	15.9	15.9	15.5	15.2
Max. Temperature (°C)	22.1	23.3	25.7	26.9	25.9	25.8	25.4	25.4	25.9	24.6	23.7	22.4
Avg. Temperature (°F)	65.1	66.2	68.2	69.6	70.7	70.7	70.2	70.0	69.6	68.4	67.3	65.8
Min. Temperature (°F)	58.5	58.5	58.1	59.0	63.0	63.0	62.8	62.4	60.6	60.6	59.9	59.4
Max. Temperature (°F)	71.8	73.9	78.3	80.4	78.6	78.4	77.7	77.7	78.6	76.3	74.7	72.3
Precipitation / Rainfall (mm)	148	95	118	196	116	37	54	78	113	250	270	225

Figure 3- Bandarawela weather by month/ weather average

3. LANDSLIDE HAZARD INCIDENT DETAILS

3.1. Account of Incident

This sloping area has undergone major alterations to the construction of roads, railways and buildings, creating high slope cuttings. According to the information provided by the residents, the land area closer railway line had been subsiding time to time with the rain. The distance of the impacted area is about 100m along the railway line. During rainy season it poses a high risk on the commuters and the railway transportations due to subsiding of the ground with the railway line. Figure 04 shows some of the critical locations on the mitigation site.



Location 01

Location 02

Location 03

Figure 4 – Slope failure hazard incident area

3.2. Effects and Consequences of Landslide

During intense rainy periods the unstable slope and debris tends to fall imposing risk on the railway line, Colombo-Badulla road, passengers, commuters and people who are living nearby and pedestrians of the road.

3.3. Description of any remedial measures already undertaken to reduce the potential risk

No any remedial measures have been taken to reduce the potential risk of the area.

3.4. Evacuation

No any evacuation for this site.

3.5. Resettlement (Progress)

No any resettlement for this site

Landslide Mitigation Site No - 145 - Badulla Bandarawela - Diyathalawa - Bandarawela Road (AIIB Project)

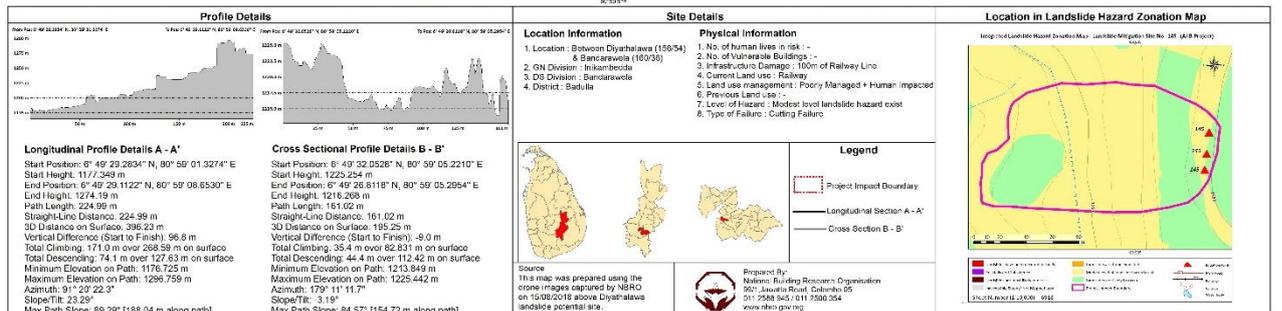


Figure 5 – Land-use, General Information, Risk Elements and Cross Section of the location

4. DESCRIPTION OF THE AREA OF THE LANDSLIDE/SLOPE FAILURE AND AREAS ADJACENT TO THE LANDSLIDE AND CURRENT LEVEL OF RISK

4.1. Surrounding area of the Slope Failure/ Cutting Failure

The proposed mitigation site is located close to the Bandarawela town and railway station. The main railway line, signal line, railway buildings and residential houses. The area include 100m from the railway line are belongs to railway department on both sides. Around 10 trains running through the mitigation site and the Bandarawela railway station is located about 100m from the location. (Reference to Fig .5)

Vegetation ...

The Colombo-Badulla main road runs parallel to the site and the area can be identified as a highly built-up area as the mitigation site is located in the Bandarawela urban area. There are several residential houses in the SLR reservation area at the upper part of the railway line and commercial shops could be observed along the Colombo - Badulla main road where downslope the railway line.

The Bandarawela town center, commercial buildings, hotels, guest houses, holiday resorts, residential houses, banks and many government and institutional buildings are located within 500m radius from the mitigation location.

4.2. Current Level of Risk

If the site is not rectified to prevent future landslides, soil mass or debris of the future cutting failure can directly affect the residents, operations of trains and the functions of Colombo-Badulla road. The railway passengers, local and foreign travelers, the occupants of the neighboring houses, their livelihood activities and life of the public who use Colombo-Badulla road would be at risk due to this unstable ground section and their smooth functioning will be disrupted.

5. DESCRIPTION OF THE WORKS ENVISAGE UNDER THE PROJECT

The proposed project aimed to ensure that the further subsidence of soil is prevented. The proposed mitigation works will be largely concentrated on unstable land area. Therefore, surface drainage improvement, soil nailing, toe protection with retaining structures and soft soil improvement will be implemented as the mitigation.

6. BRIEF DESCRIPTION ON THE SURROUNDING ENVIRONMENT WITH SPECIAL REFERENCE TO SENSITIVE ELEMENTS THAT MAY BE AFFECTED BY THE PROJECT ACTIONS

Following sensitive elements will be at risk due to project actions;

- Neighboring houses and its occupants and their home gardens
- Railway commuters
- Railway signal lines and the railway tracks
- Railway buildings located nearby
- Pedestrians and vehicles using the Colombo- Badulla Road
- Commercial buildings and their activities along the main road
- Current services, economic and tourism activities of the area

(Ref. Fig.6 Sensitive elements that may be affected by the project actions)



Figure 6a: Neighbouring houses



Figure 6b: Home gardens



Figure 6c: Railway and signal line/ passengers



Figure 6d: Railway buildings and properties



Figure 6e: Commercial buildings along the road



Figure 6f: Colombo –Badulla main road and users

Figure 6 – Sensitive elements that may be affected by the project actions

7. IDENTIFICATION OF SOCIAL AND ENVIRONMENTAL IMPACTS AND RISKS RELATED TO THE WORKS

Chart below summarizes the positive and negative impacts which are envisaged during project actions and their significance.

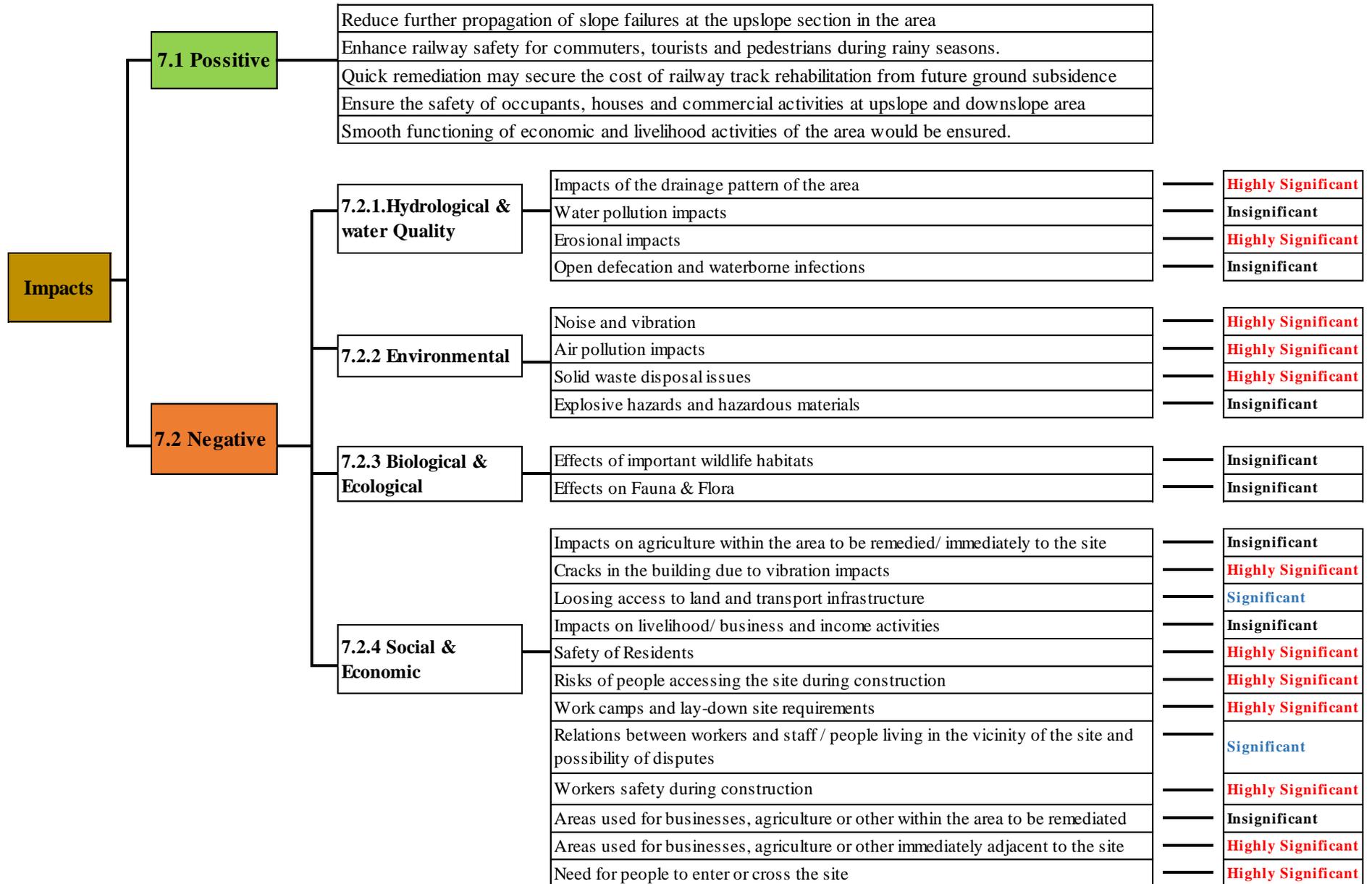


Figure 7 – Summary of the impacts which are envisage during project

7.1. Positive Impacts

- The project will reduce further propagation of slope failures at the upslope section in main railway line at CH 160/00 – 160/22. Therefore, the proposed project will significantly enhance railway safety for commuters, tourists and pedestrians during rainy seasons. It will allow to keep the railway track open throughout the year. Quick remediation may secure the cost of railway track rehabilitation from future ground subsidence in the area.
- Up country area is highly tourism attraction destination in the country and most of the tourists use rail transportation to reach this area. Therefore, tourism will not be interrupted during rainy season while the safety of commuters will be ensured.
- Vehicle and pedestrian using Colombo-Badulla road, and commercial and residential buildings located closer to slope failure would be safe from the mitigation.
- Smooth functioning of economic and livelihood activities of the area would be ensured.

7.2. Negative Impacts

The mitigation works are generally confined to an area which is already unstable and highly potential for slope failures. Therefore, negative impacts are much localized and also limited to construction period.

Table 1 – Negative impacts and their level of significance

Impacts during the construction period	Level of Significance
7.2.1 Hydrological and water Quality impacts	
7.2.1.1 Impacts of the drainage pattern of the area There were not proper drainage pattern in this area and only small drain could be observed to allow storm water run-off which is not sufficient. Disruption of existing surface and sub-surface drainage pattern in the area is envisaged due to the reshaping of the unstable slopes, removal of soils, and diversions of existing drainage and surface runoff flow paths. The mitigation works in this site will focus largely on the drainage improvement. Due to diversions, cut-off drains and increased sub-surface drainage, the premises will have increased flows at higher velocities in rainy periods. The impact would be greater as the site is located highly built-up area and closer to the residential houses.	Highly Significant
7.2.1.2 Water pollution impacts It was not observed any stream, canal or water source closer to the mitigation site. Hence, the water pollution impact for this site is insignificant.	Insignificant
7.2.1.3 Erosional impacts The project may envisage clearing of surface vegetation exposing soils during rainy period. The exposed surfaces can get eroded if proper covering is not maintained. The existing surface and sub-surface drainage pattern in the area will be disrupted during construction phase. However, as the area exposed is confined to a smaller plot, the erosional impacts are localized but significant. This would be directly impacted to the nearby residences, users of Colombo-Badulla road and pedestrians.	Highly Significant
7.2.1.4 Open defecation and waterborne infections As the site is located in highly built-up area, possibility of open defecation is low.	Insignificant

7.2.2 Environmental Impacts	
<p>7.2.2.1 Noise and vibration impacts</p> <p>Noise and vibration are expected from machinery in site preparation and landscaping. Impact is significant as the construction is carried out in the highly built-up area and closer to houses with occupants.</p> <p>Vibrations can cause adverse effects on the residential houses located closer to the site, railway track, railway buildings, road retaining wall and other structures near the site. All the proposed construction activities including excavations shall be carried out under the close supervision of qualified engineers ensuring the safety and integrity of the structures in the vicinity and minimizing the inconvenience to the residents of the area, occupants of the adjacent buildings and the road users.</p> <p>The noise generated from the machinery will interrupt the economic activities and smooth functioning of the area due to many residential, commercial, institutional and other buildings are located within the 100m influential limit of the proposed mitigation site.</p> <p>Hence, monitoring of vibration and noise due to construction activities should be done on a regular basis.</p>	Highly Significant
<p>7.2.2.2 Air pollution impacts</p> <p>Potential impacts on the air quality will be due to the fugitive dust and the exhaust gases generated in and around the construction site due to vehicular movement and site clearance, storage and handling of construction materials such as sand, cement, etc.</p> <p>The air pollution impacts from the construction is highly significant during dry periods for the activities of the railway station, road users, workers, occupants of the neighboring houses, commuters and pedestrians as the proposed site is located closer to a town center and occupied houses.</p>	Highly Significant
<p>7.2.2.3 Solid waste disposal issues</p> <p>During the construction phase, two types of solid waste will be generated; spoils resulting due to construction activities and domestic refuse generated by the labour force engaged in construction work.</p> <p>This mitigation site is located very closer to the Bandarawela town center and the area has high population density. Poor management of solid waste such as litter, food waste, and construction waste during the construction phase may lead to create inconveniences to occupants of the neighboring houses, passengers, users of the town area and the workers. Also, these can block the water seepages in the area to create breeding grounds for water borne refection vectors and pathogens peril. Waste can pollute the soil, and leave various environmental impacts if proper disposal mechanism is not in place during the construction period.</p>	Highly Significant
<p>7.2.2.4 Explosive hazards and hazardous materials</p> <p>Since the affected area has no rock boulders, explosives may not be used and the rock blasting is not envisaged.</p>	Insignificant
7.2.3 Biological /Ecological Impacts	
<p>7.2.3.1 Effects of important wildlife habitats</p> <p>There are no forested/ wild-life reservation areas within the project influence area with high biodiversity, or habitat fragmentation.</p>	Insignificant
<p>7.2.3.2 Effects on Fauna & Flora</p> <p>Majority of the trees found in the area are not endemic, threatened and identified in the red list of IUCN.</p>	Insignificant

7.2.4 Social and Economic Impacts	
<p>7.2.4.1 Impacts on agriculture within the area to be remedied/ immediately to the site</p> <p>There are no agricultural practices within the area to be remedied or immediately to the site.</p>	Insignificant
<p>7.2.4.2 Cracks in the building due to vibration impacts</p> <p>There are several buildings located in the proximity of the mitigation site. Houses with occupants, commercial buildings, buildings of railway department and huge retaining wall constructed for road cut slope are located close to the unstable area. During the construction heavy machinery will be used and the vibration can cause cracks in these buildings and houses. Several cracks were observed in some of houses located upper part of the site and it might be widening due to the vibration. Therefore, the impact is significant.</p>	Highly Significant
<p>7.2.4.3 Loosing access to land and transport infrastructure</p> <p>The mitigation works will be concentrated on the railway reservation area and some of houses were located in the reservation area closer to the site. Many people use railroads to gain access to these houses. Therefore, construction activities if this area might obstruct the access to their lands.</p>	Significant
<p>7.2.4.4 Impacts on livelihood/ business and income activities</p> <p>There is no significant impact on livelihood, business or income activities of the area.</p>	Insignificant
<p>7.2.4.5 Safety of Residents</p> <p>The mitigation site is located closer to the residential area and most of people use railway track to gain access to their homes. Therefore, the risk of accidents due to negligence is very high on this site.</p>	Highly Significant
<p>7.2.4.6 Risks of people accessing the site during construction</p> <p>The site may have machinery with high hazard risk such as drilling, boring and excavation machines etc. Site may use high voltage power for operation of certain machinery. Construction may use materials such as metal aggregates, steel etc. which can be injurious under improper storage and handling.</p> <p>Only skilled workforce will be safe working in this environment. If unauthorized persons access the site, they may be at risk of being subjected to accidents by operating heavy machinery.</p> <p>Residential housing is located close to the site and many people use the railroads to gain access to their homes. Hence, careless operation of machinery can cause fatal injuries and accidents to occupants and pedestrians.</p>	Highly Significant
<p>7.2.4.7 Work camps and lay-down site requirements</p> <p>The camps site will be selected in the neighbourhood of community. If proper camp management is not in place it may result several labour issues, social issues with community such as conflicts for shared resources with the community, nuisances, and management of waste etc. If temporary camps are built in the close proximity of the site, solid waste management and sewage will be an issue.</p>	Highly Significant
<p>7.2.4.8 Relations between workers and staff / people living in the vicinity of the site and possibility of disputes</p> <p>The construction workers at this site will be from different social backgrounds and from different geographical areas often under poverty. Usually, they are with poor educational and social background. Such communities may have a wide range of social issues to cause distress on the neighbouring community and the railway staff of the Bandarawela station. Although the workers who would engage in such issues will be rare, even few possibilities cannot be ignored.</p>	Significant

<p>7.2.4.9 Workers safety during construction</p> <p>The workers may be exposed to risk from falling. Fatal injuries may occur if the slopes fail. The heavy construction machinery may be used in limited work spaces. Risk of hazard from vehicles and construction machineries accidents is highly significant at this site. Contractor may engage under age workers (children) for construction work, which is risky and can results serious accidents and injuries.</p>	<p>Highly Significant</p>
<p>7.2.4.10 Areas used for businesses, agriculture or other within the area to be remediated</p> <p>There are no areas used for business, specific agriculture practices or other within the area to be remediated.</p>	<p>Insignificant</p>
<p>7.2.4.11 Areas used for businesses, agriculture or other immediately adjacent to the site</p> <p>There is privet shopping complex in front of the mitigation site. Therefore, the construction activity may cause damage to the building or disturbances to the smooth functioning of the activity.</p>	<p>Highly Significant</p>
<p>7.2.4.12 Need for people to enter or cross the site</p> <p>Excavation machineries, loaders, trucks etc. will be used in the road and railway station premises where pedestrians, railway commuters and railway staff are moving. There is no special need for commuters and the station staff to enter the site for other purposes. Construction may use materials such as metal aggregates, steel etc. which can be injurious under improper storage and handling. However, unauthorised entry of ordinary people may occur due to intentional or unintentional purposes and they may be at risk due to operating machinery, vehicles, electricity, and may be blasting materials.</p>	<p>Highly Significant</p>
<p>7.2.4.13 Code of conduct</p> <p>The site is located within Railway station premises. Therefore, it has separate regulations maintaining by railway staff, especially operating train services and handling cargo etc. Hence, the workers should adhere to the rules and regulations of this premises.</p>	<p>Highly Significant</p>

8. SITE SPECIFIC RISK ANALYSIS

Table 2 – Site specific Risk Analysis

Risk	Affected group	Risk level
1. Facing railway accidents when working / shifting in between railway tracks.	Workers	Moderate
2. Transporting materials and machineries	Workers/ Community nearby	Very high
3. Facing railway accidents during constructions at night time	Workers	Moderate
4. Accidents from the construction activities and materials placed on the railway tracks	Railway commuters Employees of the station	High
5. Water inundation in the unstable area	Workers Community nearby	Moderate
6. Injuries due to explosions with flammable substances /Fires	Railway commuters Community nearby	High

7. Work adjacent to electrified lines, signal lines	Workers	Moderate
8. Site Working – Working in poor visibility	Workers Railway commuters	High
9. Emergency evacuation	Workers	High
10. Extreme weather conditions (wind, rain etc.)	Workers	High

9. SIGNIFICANT ENVIRONMENTAL AND SOCIAL IMPACTS

Environmental, social impacts or risks that will require special attention on the part of NBRO.

9.1. Priority Health and Safety Issues. Specific H&S concerns that require measures that go beyond the standard contractual requirements for contractors

The health and safety issues pertinent to this site is significant as the workers have to work on almost vertical unstable slope with a risk of slope failure. The health and safety of workers is highly significant at this site. Such common E & HS issues have been discussed in the ESMF. Worker safety requirement in the construction site is more detailed under 2003 5: Safety equipment and clothing in the section 2003: Working conditions and community health and safety in the Bidding document.

9.2. Child Labor and Forced Labor

Child labor & Forced labor is detailed under 2003.3 under section 2003: Working conditions and community health and safety in the Bidding document.

10. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

Measures to manage and or mitigate the impacts and risk especially the significant impacts and risks identified in sections 7 & 8. This section will include the specific recommendations and requirements of the ESMP for design stage, construction phase and maintenance operation phase.

10.1. Resettlement Action Plan

There is no project based resettlement in this site. There are occupied houses closer to the mitigation site and cracks were observed in some houses located closer to the site. These houses may have some impacts in the form of structural damage during the project actions due to ground vibration induced by heavy machinery operation. (The scheme of compensation, in case of damage to structures due to project should be arranged, (Refer 2002.2.17) utilities and roadside amenities in contracts requirement to ESMP.

10.2. Evacuation of people

Project based evacuations are not required for this site. But, the mitigation area should be named as a “No Entry Zone” for the outsiders during the construction period.

10.3. Procedure for removal of damaged structures, facilities infrastructure (consent from owners to remove the articles)

This risk may not be triggered in this site.

10.4. Requirement for compensation for loss of property /uses due to project actions

It may require to compensate if any damages happen to the properties of Railway Department, commercial buildings along the road, houses, retaining wall, road and any other properties closer to the site during constructions.

10.5. Public awareness and education- needed for following areas

- i. Programs to inform and educate people in the vicinity about the risks posed by unstable land section located closer to the railway premises specially the occupants of the households in the upslope and downslope area.
- ii. Requirement for special awareness for commuters, passengers, road users and the people passing through the mitigation site with potentially high risk during construction phase and early warning.

10.6. Design based Environmental/ Social Management considerations

The site is located in aesthetically beautiful, environmentally sensitive natural environment in the rural setup. Hence, following environmentally and socially significant design considerations are recommended.

Table 3 – Social and Environmental Consideration in Design Stage

Design feature	Recommended level of consideration for this site
<p>i. Natural resource management and resource optimized designs Project specific designs should be considered to eliminate mass clearing of vegetation and minimum number of removals of grown tree species. Sufficient emphasis should be made to consider conservation of trees if important tree species are found.</p>	Moderate
<p>ii. Site Planning The site is located in a very limited space of a railway reservation. The vehicle parking sites, material storage and temporary shelters etc. should not be installed in the danger zones of the slides. It is very necessary to keep trained flagman or safety officer of SLR during the construction period and proper communication between contractor's workforce, railway station and PMU must be built. The SLR buildings within the close proximity can be used as camping sites or storage houses under the permission of the Railway Department. Prior approval from railway department is required if the railway reservation is to be used for camping, storage or parking.</p>	Very High
<p>iii. Conservation of water resources If extraction of water is involving as a mitigation measure, as the extracted water is in a good quality and yield it can be considered as a source of water for downslope houses who are currently depending on less reliable local water sources.</p>	Low
<p>iv. Consideration of opportunities for harness development potentials The mitigation site is located closer to the Bandarawela town and there are some residential houses in the railway reservation. The occupants of this area use the railway line to access their houses. Therefore, it is recommended to create a secure access path with mitigation activities to ensure safe access to their home.</p>	High

<p>v. Aesthetically compatible design considerations As the site is located in a well-developed and tourist-attractive area, it is important to consider aesthetically pleasing plans to develop the area as a tourist attraction and ensure minimal visual pollution.</p>	Very High
<p>vi. Consideration of green environmental features As many of the mitigation works are carried out in well maintained premises, it is recommended to consider green environmental designs as much as possible in the designs e.g.: use of local vegetation species for erosion control, combination of plants to sustain species diversity in the environment, avoiding inclusion of potentially invasive species & etc.</p>	Very High
<p>vii. Workers and community safety Due to the close proximity to the railway tracks people may face railroad accidents specially the workforce during the construction phase. Unauthorized entry and ignorance may cause severe accidents around the site. Activation of slides or ground subsidence may occur during construction phase and may pose threat to workers, occupants of the downslope houses and commuters. Therefore, design-based safety consideration such as berms, safety nets etc. should be considered.</p>	Very High
<p>viii. Erosion control structures During rainy season the flow in the drainage structures can be significantly high. During rainy season the heavy flow of surface runoff can be expected through the unstable slopes. This water should be conveyed to nearby storm water drains. Hence the design should adequately consider flow speed breakers to reduce erosive flows of slopes.</p>	High
<p>ix. Low post maintenance and operation designs The mitigation should consider passive techniques such as gravity drains for drainage management. Correct pipe diameters, pore diameters and laying angles should be considered to avoid clogging of drains. Low maintenance structures and designs such as designs to withstand erosive forces, sediment trapping systems etc should be considered if drain water is expected be directed to natural streams. The materials used for structures and should be chosen carefully so as to withstand weather conditions with high durability. Designs should specially consider corrosion prevention techniques if steel structures are used.</p>	Moderate

10.7. Mitigation of impacts during the construction phase

10.7.1. Construction contractors' requirement to comply with environmental and social management during the construction phase

Measures to manage and to mitigate the environmental and social impacts are generally common to all landslide mitigation sites. Such impacts are largely attributed to activities in the construction phase. The mitigation of impacts therefore becomes an obligation of construction contractor. NBRO has prepared a comprehensive document on “*contractors’ requirement to comply with Environmental and Social Health and Safety (ES & HS) management during the construction phase*” to be included in construction contractors’ bid document. The main sections are summarised below (*Table 4*) indicating the degree of relevancy for this site. For details ESMP for construction contractors should be referred.

Table 4 – Contractor requirement to comply with ES and HS

Reference No. as per construction contractors obligation to ESMP	Item	Relevant to the project
2002. Environmental and Social Monitoring		
2002.2 1)	Storage on site	Highly Relevant (Railway line, nearby buildings)
2002.2 2)	Noise and Vibration	Highly Relevant (Railway line, staff, neighbouring houses, commuters)
2002.2 3)	Cracks and damages to the buildings	Highly Relevant (neighbouring houses)
2002.2 4)	Disposal of waste	Highly Relevant (railway line, reservation, nearby houses, commuters)
2002.2 5)	Disposal of refuse	Highly Relevant (nearby houses, staff and commuters)
2002.2 6)	Dust control	Highly Relevant (nearby houses, staff, train passengers, road users and commuters)
2002.2 7)	Transport of Construction materials and waste	Highly Relevant
2002.2 8)	Water	Relevant
2002.2 9)	Flora and Fauna	Not Relevant
2002.2 10)	Physical and cultural resources	Not Relevant
2002.2 11)	Soil Erosion	Highly Relevant
2002.2 12)	Soil Contamination	Relevant
2002.2 13)	Borrowing Earth	Relevant
2002.2 14)	Quarry Operations	Not Relevant
2002.2 15)	Maintenance vehicles and Machinery (pollution)	Relevant
2002.2 16)	Disruption to public	Highly Relevant (railway passengers, occupants of neighbouring houses)
2002.2 17)	Utilities and roadside amenities	Highly Relevant
2002.2 18)	Visual environment enhancement	Highly Relevant
2002.5. Environmental Monitoring	Baseline surveys (air, water, noise, vibration, crack surveys)	Highly Relevant
	Surveys during construction (air, water, noise, vibration, crack surveys)	Highly Relevant
	Surveys during operation phase	Refer site specific monitoring plan
	Reporting and maintenance of records	Relevant
2003. Working Conditions and Community Health and Safety		
2003.2	Safety organization and communication	Highly Relevant (heavy machinery)
2003.3	Child Labor and Forced Labor	Highly Relevant
2003.4	Safety reports and notification of accidents	Highly Relevant
2003.5	Safety Equipment and Clothing	Highly Relevant
2003.6	Safety inspections	Highly Relevant
2003.7	First Aid Facilities	Highly Relevant
2003.8	Health and safety information and training	Highly Relevant
2003.9	Plant equipment and qualified personnel	Relevant
<p>Relevant: The section is relevant to the site as a common ESMP applicable to any site Highly relevant: The contractor should pay special emphasis in the preparation of environmental method statements to ensure that the relevant ESMP is implemented specific to the site</p>		

Possibly relevant: This ESMP will be triggered if the site come across with relevant aspect during project implementation

Not relevant: The section may not be relevant to this site under disclosed conditions

Optional: require to be implement if needed only

Refer site specific monitoring plan: Contractor is obliged to carry out monitoring as specified in the site specific monitoring plan in addition to monitoring requirement indicated in contractors ESMP

Reference: Contractors Obligation for implementation of ESMP

10.7.2. Site Specific Mitigation

Given below is the site specific mitigation measures that the project is expected to implement during the construction period.

Table 5 – Site Specific ES and HS Mitigation Measures

Mitigation item	Project Implementation Phase	Responsibility
<p>i. Avoid train accidents / possible emergency situations during construction</p> <p>Safety officers and flag men of SLR are highly recommended to each mitigation location. At least 02 flagmen should be kept in a site. Flag man or the safety officer has all the responsibilities of the train schedules and stop train in emergency situations. Always be alert on the signals and instructions given by the safety officers of SLR. An awareness and training programme on railway safety for the construction workforce, railway station staff and users are compulsory.</p>	Site preparation & construction	PMU Construction Contractor Railway Department
<p>ii. Traffic management and safety</p> <p>Traffic management system should be in place day and night. A good traffic management plan should be prepared with the concurrence of Sri Lanka Railway Department as this site is located very close to the railway station and major road. Proper rail road safety measures should be included with warning signs and permanent trained watchmen, luminous sign boards indicating instability risk and road obstruction signs, night lamps etc. are strongly recommended at this site. Flagman of the Railway Department is responsible signaling the in and out trains through the stations according to the requirements of the construction activities.</p>	Construction	Construction Contractor and Railway Department
<p>iii. Impacts on railway transport infrastructure (especially temporary loss of road or rail access, risks of traffic congestion)</p> <p>A good traffic control should be implemented in the construction stage. As there are several bends in rail line closer to the site, proper safety measures should be included with warning signs and permanent trained watchmen, flagman, luminous sign boards indicating slope instability risk and rail road obstruction signs, night lamps etc. are strongly recommended at this site. All the safety sign boards must be used under the supervision of SLR and according to the railway transportation.</p>	construction	Construction Contractor

<p>iv. Minimize erosional impacts during construction</p> <p>During the removal of the plants, attention should be paid to maintain minimum disturbances to soil cover and natural vegetation. Removal of vegetation can lead to high level of erosion. Vegetation removal should be done in several phases based on the requirement of land to mitigate erosion. It is recommended that mitigation works involved with site clearance, slope reshaping, removal of debris etc. are avoided during rainy season. This should be considered in project planning stage. All cut and fills of the slope should be compacted immediately.</p> <p>Silt traps should be introduced to cut down sediment laden runoff and open drain should be directed to the main drainage system of the area.</p>	<p>Site preparation & construction</p>	<p>Construction Contractor</p>
<p>v. Planning project activities inside the sites</p> <p>As contractor has to operate mitigation actions within site, he should carefully prepare a plan for management of construction activities inside the railway reservation premises. This should include careful selection of material storage as vehicle parking, mixing of concrete, cleaning activities etc. which considering the safety of workers, passengers, tourist and optimization of limited space. Storage of construction materials should be located sufficiently away from the railway line.</p> <p>If it is proposed to set up labour camps in the railway reservation area, prior approval should be obtained from SLR and should comply with the guidelines and recommendations of them.</p>	<p>Site preparation & construction</p>	<p>Construction Contractor</p>
<p>vi. No Entry Zone</p> <p>The PMU should make a detailed assessment on possible risk of slope destabilization in the site during construction phase. “No entry zone” may require to be declared.</p> <p>Also mitigate the risk of accidents from moving vehicles operational machinery construction activities, electrical leakages etc. should be given high priority in the health and safety management plan. Sign boards indicating slope instability risk and construction activities are strongly recommended at this site since there are several bends of railway line.</p>	<p>Construction</p>	<p>E & S Unit of PMU contractor</p>
<p>vii. Machinery and material transportation</p> <p>Inform and obtain prior approval from the authorized person of SLR is necessary before any material and machineries transport through / along the railway tracks. If the railway line is used for material transportation, extreme care should be taken because of possible accidents and damages to the railway line and its components are high. The railway trucks, signal line and other properties of railway department must not be damaged due to the material and machineries transportation.</p> <p>The commuters and the workers should be informed about the material and machineries transportation schedule.</p>	<p>Construction</p>	<p>E & S Unit of PMU Contractor</p>
<p>viii. Noise and vibration control</p> <p>The noise and vibration generating activities may disturb the smooth flow of activities of the commercial and residential area. Hence, All machinery, equipment and vehicles should be maintained the National Emission Standards (1994). Noise control regulations stipulated by the CEA in 1996 (Gazette Extra Ordinance, no 924/12) should strictly be implemented for crushers, construction vehicles and equipment.</p>	<p>Construction</p>	<p>Construction Contractor</p>

<p>Vibration generating activities should be done within the prescribed limits to avoid possible damages. Cracks in the railway line, SLR buildings, commercial buildings and residential houses in surrounding should be monitored before, during and after completion of the project. Several cracks were observed in houses located nearby the mitigation site during the field investigation. Suitable compensation should be made if cracks from the damages or cracks enlarge due to construction work.</p>		
<p>ix. Disposal of construction waste</p> <p>The contractor should pay special attention with respect to disposal of construction waste. This site is located within a highly crowded urban area and also a place that attracts local and foreign tourist.</p> <p>Hence, any waste if generated should store properly without getting washed off and dispose according to approved procedures by the PMU. Construction waste should not dispose within the site or around the railway line or not to be burned on site in any circumstance.</p> <p>Used oil, lubricants, cleaning materials, etc. from the maintenance of vehicles and machinery must be collected in holding tanks and removed from site by a specialized oil recycling company for disposal at an approved hazardous waste site.</p> <p>Appropriate communication and training programs must be put in place to prepare workers to recognize and respond to workplace chemical hazards.</p>	<p>Site preparation & construction</p>	<p>Construction Contractor</p>
<p>x. Dust and aerosol control screens</p> <p>The Contractor must ensure that dust generation is mitigated and will not annoy commuters, road users, passengers and people who are living near the mitigation site. Following measures should implement to control dust concentration in order to maintain safe working place and minimize disturbance to surrounding residences/houses.</p> <ul style="list-style-type: none"> - Wet down and spray water at construction site - Take steps to avoid dust emissions during loading and unloading of construction material. - All filling works are to be protected or covered in a manner to minimize dust generation - Material loads must be suitably secured during transportation to prevent the scattering of soil, sand, materials or dust. - Special screens etc. should be used if heavy dust or aerosol generating activities are envisaged. 	<p>Site preparation & construction</p>	<p>Construction Contractor</p>
<p>xi. Water for construction</p> <p>Water for construction should be obtained only from approved places. If contractor intends to use water from the railway station, it should be done through the consent of Bandarawela railway station master.</p>	<p>Construction</p>	<p>Construction Contractor</p>
<p>xii. Priority Health and Safety Issues</p> <p>As the workers in the site have to work in high risk conditions, it is imperative to implement recommendations given in section 2003 of contractors' obligation on ESMP under "working conditions and community health and safety". These recommendations should be followed carefully in a proper organization and safety monitoring system.</p>	<p>Construction</p>	<p>E & S Unit of PMU contractor</p>

<ul style="list-style-type: none"> i. Prepare a special Occupational Health and Safety Management Plan prior to commencement of construction activities ii. A good warning system, watchman and fulltime flagman of the Railway Department is highly recommended for this site for both worker and commuter safety. iii. Adoption of standard worker safety methods iv. Provision of personal protective equipment (PPE) such as safety boots, helmets, protective clothing goggle etc. v. Provision of trainings and awareness programs to employees vi. Conducting hazard analysis and plan/provide adequate mitigation measures for such hazards identified, prior to carrying out major construction activities. vii. Additionally, work should be discontinued for sufficient time period during rainy period as working on unstable slopes will be highly risky in the rainy season. viii. Safety barriers and safety nets should be installed at places of risk to protect workers and community from boulder falling risk ix. Proper emergency management unit for other accidents (first aids facilities, safety items, hospitalization facilities and transportation facilities) should be maintained for this site. 		
<p>xiii. Safety structures/sign boards</p> <p>During construction phase adequate safe fencing should be established to prevent potential falling risk of workers from upslope areas.</p> <p>As the Colombo-Badulla major road located downslope of the mitigation site many vehicles and passengers can see around the place. Hence, warning sign boards indicating slope instability risk should be placed along the road as well.</p> <p>As the risk is high during the rainy season where there is no construction work, it is mandatory that safety signs boards are displayed even during the no project period as well.</p>	Construction	E & S Unit of PMU contractor
<p>xiv. Use of sanitary facilities of contractor's workforce</p> <p>The contractor should prepare temporary sanitary facilities for the workforce within the site, to mitigate open defecation of the workers. Prior approval of the Station Master should be obtained, if using property belonging to the railway department.</p>	Construction	Construction Contractor
<p>xv. Working hours</p> <p>The construction activities should be restricted to day time only. Working after 6.p.m. is not recommended for any reason due to safety issues and residential houses are located nearby.</p>	Construction	Construction Contractor
<p>xvi. Need for people to enter or cross the site</p> <p>Possible unauthorized access to the site should be avoided by awareness, warning signs and vigilance by the contractor's full time watchmen.</p>	Construction	Construction Contractor
<p>xvii. During construction good housekeeping should be maintained to minimize visual pollution</p>	Site preparation & construction	Construction Contractor
<p>xviii. Workers code of conduct</p> <p>Possible disputes between the labor force and the villagers, staff of the station, commuters and tourists should be prevented by maintaining the agreed code of conduct by the contractor.</p>	Construction	Construction Contractor

10.7.3. Monitoring requirements specific to the site

Following monitoring plan is strongly emphasized during the construction phase specific to this site. In addition to this, monitoring procedure indicated in the contractors' obligation to ESMP should also be implemented by construction contractor. The contractor is expected to indicate in the bid the ESMP procedure to be implemented along with relevant proofs of his competency. The cost for ESMP will require to be indicated as a separate pay item. The environmental and social management method statement is expected to be submitted by the selected construction contractor and to be approved by the PMU unit.

Table 6 – Environmental and Social Monitoring Plan – Construction Phase

Monitoring requirement	Parameters	Frequency
i. Baseline monitoring	Water quality	-
	Pre crack survey for the buildings	Once**
	Ground vibration	Once*
	Air quality: particulate matter	Once*
	Background noise measurement	Once*
ii. During construction	Water quality	-
	Crack survey for the buildings	Once**
	Ground vibration	During operation of drilling machinery, boring works, or any works that generate ground vibrations*
	Construction noise	Once a month during heavy noise generation times*
	Air quality particulate matter	Once a month *
iii. Vehicular Emission	All machinery/vehicles operational should have the emission control test certificate as applicable - should be checked by the site ES officer of the consultant	
iv. Monitoring agency	* A competent independent monitoring agency with registration of Central Environmental Authority for all parameters except crack surveys **Crack surveys should be conducted by competent agency acceptable to PMU	
v. Reporting requirements	Stream water quality – Comparison with ambient water quality standards published by the CEA, 2017 Pre crack survey of the buildings -Professional report Ground vibration -as per the interim standards on vibration for the Machinery, Construction activities and Vehicular movements, CEA Background noise measurement –Extraordinary Gazette No.924.1, May 23,1996, CEA Air quality particulate matter - The National Ambient Air Quality standards stipulated under the Extraordinary Gazette, No. 1562/22 August 15, 2008 -Central Environmental Authority of Sri Lanka.	

11. PUBLIC AND STAKEHOLDER CONSULTATION - the public consultations that have been and/or will be held

11.1. Public Consultation

The occupants living closer to the mitigation site were consulted during the field visit. They have built their house in lands belong to the Railway Department on lease basis. They were made aware of landslide mitigation project and the funding mechanism. The occupants expressed their willingness to the project and to give full support to the project.

11.2. Stakeholders involved in the consultations any recommendations or agreements reached in the consultations (Refer annexure II)

Mr. H.M.K.W. Bandara, Deputy Chief Engineer (Project), Mr. E.M.S.P.K. Deegala, Deputy Chief Engineer (Track) and Mr. D.W.N.Amarasena, Superintend Engineer (Design) of Way and Works Railway Department were consulted during the group discussion about the project activities of the railway sites. They highlighted the procedures to be followed during the construction phase and how to carry them without disturbing the railway transportation.

12. PREVENTIVE MEASURES FOR COVID-19 THAT WAS ISSUED BY SRI LANKAN NATIONAL HEALTH AUTHORITY

COVID-19, the novel coronavirus infection has not been totally eradicated in the world. Therefore, to prevent/ control of the spread of infection also to prevent panic situations in the event of detecting a suspected case, all contractors are required to develop a COVID-19 Preparedness plan and need implementing in the site as per the “Health and Safety Guidelines for Sri Lankan Construction Sites to be adopted during COVID 19 outbreak” Guidelines given by Construction Industry Development Authority CIDA 29th April 2020.

13. CLEARANCES, NO OBJECTION, CONSENT AND APPROVALS REQUIRED FOR THE IMPLEMENTATION OF THE PROJECT

Table 7 – Clearances, No Objections, Consent and Approval

Requirement / Approval / Institution	Relevance to the project
12.1 Project implementation	
Approval from the District Secretariat	The approvals will be required and the proposals need to be presented at the District Coordinating Committee, to which chief minister and stakeholder agencies in the district will also participate. The Officer of PMU will present the project, disclose the project details and various concerns including environmental and social issues will be discussed at this meeting. The issues arrived will be addressed in the ESMP, the decisions and recommendations taken up at this meeting will be considered in the ESMP.
Approval from the planning committee	The approval from the planning committee of the Bandarawela Municipal Council.
12.2 Approval from the state lands owners relevant to the project	
Central Environmental Authority	Approval from the Central Environmental Authority is required as the project should comply with National Environmental Regulations
Department of Railway/ Road Development Authority	As the site is located within Railway Department land and closer to railway line, the construction activities might impact to their operations. Hence, the approval from Railway Department is needed.
Geological Surveys and Mines Bureau	Approval will be obtained for extraction of materials, transportation and disposal of earth, rocks and mineral debris. (if necessary, only).
Bandarawela Municipal Council	Approvals from Bandarawela Municipal Council will be obtained for the disposal of waste and plant litter.

Ceylon Electricity Board	Approvals from regional office of Ceylon Electricity Board will be required for power supply for site operation.
National Plant Quarantine Service	Approval from Additional Director National Plant Quarantine Service Katunayake for Director General of Agriculture under the Plant Protect Act No. 35 of 1999 Plant or seed if needed for bio Project Managed slope mitigation shall be imported into Sri Lanka under the authority and in accordance with the conditions, of a plant importation permit issued.
12.3 Consent/ no objection/ legally bound agreement from the private land ownerships	
Land owners	Signing a legally bound agreement between the land owners and the project implementing authority allowing no-objection to remove the structures, access the land, implement construction works, and engage in long-term maintenance works

The tentative timeline for getting approval is given in the table 8.

Table 8 – Tentative Timeline for getting approval

Approvals	Month 1				Month 2			
	W1	W2	W3	W4	W1	W2	W3	W4
Project implementation								
<i>Approval from the District Secretariat</i>								
Submission of application	—							
Project briefing		—						
Respond to comments			—					
Approvals					—			
<i>Approval from planning committee</i>								
Submission of application		—						
Project briefing			—					
Respond to comments				—				
Approvals					—			
<i>Other approvals</i>								
CEA								
Railway/ RDA		—						
Forest			—					
GSMB				—				
Ministry of Defense (Depends on the requirement)								
Consent/ no objection from the land ownership	—							

14. GRIEVANCE REDRESS MECHANISM FOR THIS SITE

The PMU -ES officer is responsible for establishing the grievance redress mechanism for this site for impact communities; (*Reference: Environmental and Social Management Framework for recommended procedure for establishment of grievance redress mechanism*).

15. INFORMATION DISCLOSURE

It is the responsibility of the PMU to disclose the ES information to following agencies and organizations by indicated modes as a minimum as given in the following table.

Table 9 – Proposed scheme of information disclosure

Information	Proposed agencies	Mode of information disclosure
i. Project plan (site details, design implementation arrangements)	District Secretariat, Divisional secretary, Railway station master, Other district level Agencies, NBRO district office, AIIB	Meetings, District coordination committee, submission of relevant report to sign agreements, approvals and consents.
ii. Environmental and Social Management plan	District CEA, Railway station master, AIIB	Meetings, District Coordination Committee, submission of relevant report to sign agreements, approvals and consents
iii. Monitoring reports (baseline and during construction)	AIIB and relevant parties as appropriate	Progress meetings, special meetings, submission of relevant reports
iv. Site inspections for environmental conformance workers health and safety	District CEA, Divisional secretary, Police, Railway station master, Grama Niladhari, District Office NBRO, AIIB and relevant parties as appropriate	Written and verbal communications, submission of relevant reports
v. Decisions taken and progress review meetings pertinent to ES matters	District CEA, Divisional secretary, Police, Railway station master, Grama Niladhari, District Office NBRO, AIIB and relevant parties as appropriate	Meetings, submission of relevant reports
vi. Grievance redress mechanism	Relevant parties, AIIB	Meetings, written and verbal communications

Table 10 – Level of Information gathered through consulting institutions

Date	Institution	Person contacted for information
03/02/2020 @ 13.00 hrs	Way and Works Railway Department	Mr. H.M.K.W. Bandara, Deputy Chief Engineer (Project) Mr. E.M.S.P.K. Deegala, Deputy Chief Engineer (Track) Mr. D.W.N.Amarasena, Superintend Engineer (Design)

Annexure I: Images of the site condition and the consultation



Consultation with occupants



Discussion at the Way and Works Railway Department



Mitigation area



Buildings of SLR located nearby



Commercial buildings located nearby



Residential houses located nearby

Annexure II: Report on the Stakeholder Consultation: Badulla District

Institution	Name and designation of the contact officer	Concerns raised
Way and Works Railway Department	<p>Mr. H.M.K.W. Bandara, Deputy Chief Engineer (Project)</p> <p>Mr. E.M.S.P.K. Deegala, Deputy Chief Engineer (Track)</p> <p>Mr. D.W.N.Amarasena, Superintend Engineer (Design)</p>	<ul style="list-style-type: none"> ✓ This area is under the jurisdiction of the Department of Sri Lanka Railway. ✓ The SLR has no objection and states the mitigation is very much needed. ✓ Detailed work plan and time schedules must be provided to the SLR by contractor before starting construction activities and keep good relationship between contractor, PMU and SLR. ✓ Other concerns raised <ul style="list-style-type: none"> • A safety officer or flag man of SLR is provided to each mitigation location by SLR. • At least three flagmen should be kept in a site. • Safety structures and sign boards will be provided by SLR. • Flag man or the safety officer has all the responsibilities of the train schedules and stop train in emergency situations. • Workers must be followed his advices and guidance for safety issues. • Material transportation for locations which haven't other road access will be done according to the requests of the contractor • All the cost including railway material transportation, wages of the flagman and other resources from SLR should be bear by the construction contractor. • A proper handing over of the project is required after the mitigation. • SLR will do the maintenance after mitigation. • It is emphasised that during the construction the contractor should use Personal Protective Equipment • At all times, the contractor shall provide safe and convenient passage for train transportation, traffic safety measures, barricades, flagmen and for the night work, lights and illumination should be provided. • The contractor should use temporary toilet facilities • The service infrastructure should be relocated under the supervision of SLR. ✓ It is also stated that construction waste/ excavated materials should not be a nuisance to public/commuters.

Annexure III: Proposed procedure for obtaining approvals from state land owners and environmental agencies.

1. Proposed procedure by SLR for approval for implementation of landslide mitigation projects in SLR reservation areas

- i. The design to be accepted by the SLR: The project implementing agency should submit detailed design report to SLR with a formal request on nature of approvals required. PMU should prepare above documents and should submit the documents to Way and Works of Railway Department.
- ii. Way and Works Railway Department will evaluate the proposal and may call for project briefing. The PMU should provide necessary briefing as appropriate
- iii. On the approval by SLR an agreement will be signed between SLR and Project implementing agency to access the site, erect structures, and implement mitigation works.