

## **LIST OF ABBREVIATIONS**

BCAP	-	Biodiversity Conservation Action Plan (BCAP)
BOD	-	Biochemical Oxygen Demand
CFE	-	Caring for the Environment
CEA	-	Central Environmental Authority
COD	-	Chemical Oxygen Demand
DO	-	Dissolved Oxygen
ESCAMP	-	Ecosystem Conservation and Management Project
EA	-	Environmental assessment (EA)
EIA	-	Environmental Impact Assessment
EMP	-	Environmental Management Plan
EMAP	-	Environmental Management Action Plan
EPL	-	Environmental Protection License
FFPO	-	Fauna and Flora Protection Ordinance
GoSL	-	Government of Sri Lanka
GRM	-	Grievance Redress Mechanism
IEE	-	Initial Environmental Examination
MPN	-	Most Probable Number
NEA	-	National Environmental Act
NEAP	-	National Environmental Action Plan
NEP	-	National Environment Policy
PAA	-	Project Approving Agency
PMU	-	Project Management Unit
PPE	-	Personal Protective Equipment
RDC	-	Resource Development Consultants (Pvt)Ltd
TDS	-	Total Dissolved Solid
TOR	-	Term of Reference
TSS	-	Total Suspended Solid

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# **ENVIRONMENT MANAGEMENT PLAN**

## **1.0 Objective**

This Environmental Management Plan (EMP) is developed to provide guidance to the Contractor to develop Environmental Management Action Plan (EMAP) which is required to be submitted by the contractor as a part of obligation under the contract. The EMAP shall be a comprehensive proposal by the Contractor explaining plans to ensure that the key environmental objectives as outlined in Table –05 are achieved during construction. The EMP defines the mitigation measures for significant impacts, responsibility of implementation of mitigation measures, monitoring of environmental compliance and effects. The Contractor is expected to address these in EMAP. The information contained in the EMP is a guide line and the Contractor is fully responsible for meeting the national environmental guidelines, standards, laws and regulations as well as obtaining the necessary permits and approvals. Therefore, the contractor shall employ suitable qualified person as an Environmental Officer and he /she will prepare Environmental Management Action Plan (EMAP) and ensure implementation of EMAP during construction.

To assist the Contractor in the preparation of EMAP, this EMP will also provide information to the Contractor regarding: national environmental policy, national standards, laws and regulations, administrative framework on environmental management.

The objectives of the EMP are to ensure the Contractor's work:

- Comply with national & World Bank environmental policies, regulations, standards and guidelines in all activities associated with the work including all supporting activities;
- Include good management practices through planning and commitment to environmental issues;
- Achieve a safe and healthy environment for workers and the public during construction by mitigating adverse environmental impacts and risk minimization through planning and implementation of specific safeguards;
- Incorporate mitigation measures to minimize disturbance of the natural environment; prevent or minimize all forms of pollution; rehabilitate the affected areas; adopt best practices to prevent or minimize adverse environmental impacts; develop waste management practices based on prevention, minimization, recycling, treatment or disposal of waste;
- Employ staff and sub-contractors who are aware of the environmental obligations set out in this contract;
- Include monitoring and reporting of environmental performance and non-compliance to the stakeholders ;and
- Has a good Environmental Management System put in place within the construction organization to ensure the implementation of the EMAP.

The Contractor must be aware of the environmental obligations that are stipulated in this document and declare him/her to be conversant with all the relevant environmental legislation. Implementation of the EMAP will be monitored by the Engineer through Resource Development Consultancy (Pvt) Ltd.(RDC). Notwithstanding monitoring by the Engineer as spelt out in this EMP, the contractor is responsible for self-monitoring and reporting of the environmental compliance and effects.

## 2.0 Environmental Policy and Legislations

### 2.1 National Environmental Policy

National Environmental Act (NEA) was enacted in 1980 and Central Environmental Authority (CEA) was established in 1981 as a regulatory and enforcement agency under the NEA. The CEA's statutory and enforcement powers were strengthened significantly in 1988, by an amendment to the NEA. A cabinet level ministry to handle the subject of environment was created in 1990; with the appointment of a Minister of Environment to ensure that environmental issues are given the required attention. Currently the CEA functions under the Ministry of Mahaweli Development and Environment.

The Ministry of Environment and Natural Resources (MENR) was set up in 2001 and formulated a National Environment Policy (NEP) in 2003, which is now being implemented. This policy set out the course of action needed in order to consequent Sri Lanka's natural resources and the living environment whilst allowing development to occur in an environmentally acceptable manner. The Ministry has also prepared an action Plan titled "*Caring for the Environment (CFE) 2003 - 2007 Path to Sustainable Development*" for the purpose of implementation of the NEP. The following environmental policies have been developed and released during the course of implementation of the NEP and the CFE:

- National Policy on Watershed Management with a set of Strategies and Program of Actions;
- National Policy on Wetlands Management with a set of Strategies and Program of Actions;
- National Policy on Cleaner Production;
- National Policy on Clean Development Mechanism;
- National Policy on Ecotourism.

Important Strategies and Action Plans include:

- Coastal Zone Management Plan, 2004
- Clean Air 2005 Action Plan
- Biodiversity Conservation Action Plan (BCAP)

### 2.2 Environmental Legislation

Government policy on environment has been expressed through enactment of the National Environmental Act (1980) and its subsequent amendments. The NEA, 1980 is the most significant part of environmental legislation in the country although numerous other acts apply to the aspects of development activities. Table-1 and Table-2 include the most important legislative instruments for environmental management in Sri Lanka and International Environmental Agreements to which Sri Lanka is a Party respectively. These instruments rely on enforcement and control rather than on incentives or voluntary compliance.

**Table- 1 : Selected Environmental Legislative Instruments in Sri Lanka**

- 
- Fauna and Flora Protection Ordinance (FFPO) No 2, 1937 amended 1993 (Department of Wildlife Conservation)
  - Water Resource Board Act, 1964
  - Sri Lanka Land Reclamation and Development Corporation Act No 15 of 1968 as amended by Act No 52 of 1982
  - National Water Supply and Drainage Board Law, 1974
  - Maritime Zone Law, 1976
  - Urban Development Authority Law No 37, 1978
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- National Environmental Act, 1980, amended 1988, 2000
  - Coast Conservation Act No 57 of 1981 enacted by the Coast Conservation Department, amended 1988 (applicable to the coastal area as defined in the Act)
  - Marine Pollution Prevention Act No.59,2009
  - National Heritage Wilderness Act No 4, 1988
  - Water Resources Act, 1994
  - Fisheries and Aquatic Resources Act, 1996
  - Archaeological Impact Assessment Act, 2000
  - Mines and Minerals Act. No.33 of 1992
- 

**Table 2 : Selected International Environmental Agreements to which Sri Lanka is a Party**

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- International Convention for the Prevention of Pollution of the Sea by Oil, 1954
  - Geneva Convention on the High Seas, 1958
  - Geneva Convention on the Continental Shelf, 1958
  - Convention on Fishing and Conservation of Living Resources of the High Seas, 1958 (signed but not ratified)
  - International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties, 1969
  - International Convention on Civil Liability for Oil Pollution Damage, 1969
  - Convention on Wetlands of International Importance (Ramsar), 1971
  - UNESCO Convention concerning Protection of the World Cultural and Natural Heritage, 1972
  - Stockholm Declaration of the United Nations Conference on the Human Environment, 1972
  - Convention on International Trade in Endangered Species of Wild Fauna and Flora, 1973
  - Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978
  - Convention on the Conservation of Migratory Species of Wild Animals, 1979
  - Convention on the Law of the Sea (Chapters 1 & 12), 1982
  - Vienna Convention for the Protection of the Ozone Layer, 1985 and Montreal Protocol, 1987
  - Basel Convention on the Trans boundary Movement of Hazardous Wastes and their Disposal, 1989
  - UN Framework Convention on Climate Change, 1992 and Kyoto Protocol, 1997
  - Convention on Biological Diversity, 1992
  - UN Convention to Combat Desertification, 1994
  - International Tropical Timber Agreement, 1994
  - Agreement for the establishment of the Indian Ocean Tuna Commission, 1994
  - UN Convention on the Law of the Sea, 1994
  - Washington Declaration on Protection of the Marine Environment from Land-based Activities, 1995
  - South Asian Seas Action Plan, 1995
  - Stockholm Convention on Persistent Organic Pollutants (POPs), 2001
- 

Sources: UNEP website (access Aug. 2007)

## **2.3 Environmental Approval and Licensing**

### **2.3.1 Environmental Impact Assessment**

The requirement for environmental assessment (EA) of projects was established under the amendment introduced to NEA. EA regulations were originally gazetted in 1993 under No. 772/22 dated 18<sup>th</sup> June 1993. The gazettes list development activities requiring environmental approval under the Act (“Prescribed Projects”). The activities such as “Extraction of timber covering land area exceeding 5 hectares” and “Conversion of forests covering an area exceeding 1 hectare into non-forest uses” are included under the prescribed projects list needing approval under EA regulation.

Under the procedures, projects are assessed by the relevant project approving agency (PAA). These are the line agencies for energy, water, Forest, transport etc., together with statutory authorities such as the CEA, Department of Forest, the Urban Development Authority (UDA,) and the Board of Investment (BOI) Where there is joint responsibility. The project proponent submits Preliminary Information to the CEA and CEA decides on the appropriate PAA to lead the environmental approval process.

Following the submission of preliminary information, the PAA decides whether an Initial Environmental Examination (IEE) or Environmental Impact Assessment (EIA) is required, based on the likely significance of the proposed project’s impacts on the environment. The PAA issues terms of reference (TOR) for preparation of the IEE or EIA reports.

A series of guidelines for implementing the EIA process have been issued by the CEA, commencing with a general guide for PAAs (now in its third edition: CEA 1998). All costs associated with environmental impact assessment must be borne by the project proponent.

According to environmental screening of this project, it has been identified that 241 numbers of trees are to be removed to facilitate the space required for construction of the new buildings for the IFSL. But those trees are exotic and matured trees which have been cultivated for the purpose of economical logging. Also the total area to be cleared by removing trees will be less than 01 hectare. Therefore, this project doesn’t fall into a category which needs approval under environmental assessment process (IEE/EIA) as described above. Nevertheless, it is recommended to obtain clearance from CEA to proceed with the land clearance for this project.

### **2.3.2 Environmental Licensing**

Discharge of waste to the environment is controlled by the National Environmental (Protection & Quality) Regulations No. 01 1990 (Gazette 595/16, 1990) and subsequent amendments. These regulations establish the need for any person discharging waste to do so only under Environmental Protection License (EPL) issued by the CEA, and in accordance with the gazetted discharge standards and criteria. The EPL can be issued for any period up to three years (Gazette 1159/22). Activities for which an EPL is required were listed in an Order under Section 23A of the NEA, gazetted in 2008 (Gazette No. 1533/16). Common wastewater (industrial or sewage) treatment plants has been listed as the activity which need EPL under Gazette notification No.1533/16 published on 25<sup>th</sup> of January 2008. Therefore, EPL shall be obtained for the proposed sewage treatment plant when it comes to an operation after construction.

## 2.3.3 Environmental Standards

### 2.3.3.1 Discharge Standards

In 2008, CEA gazetted maximum tolerance limits for various parameters for discharge of wastewater into (i) inland waters, (ii) coastal waters, (iii) irrigation applications (iv) public sewers with central treatment plant and (iv) hazardous waste management. When it considered the nature and impact of this project during construction period as well as an operation period, it relates to waste water discharge standard for inland waters since treated waste water from sewage treatment plant shall comply with “General Standards for discharge of Effluents into Inland Surface Waters”. Table-03 refers “General Standards for Discharge of Effluents into Inland Surface Waters”.

**TABLE-03: GENERAL STANDARDS FOR DISCHARGE OF EFFLUENTS INTO INLAND SURFACE WATERS**

No	Determinant	Unit type of limit	Tolerance Limit
1	Total Suspended Solids, mg/l,max	mg/l max	50
2	Particle size of total suspended solids	µm less than	850
3	pH value at ambient temperature		6.0 to 8.5
4	Biochemical Oxygen Demand- (BOD <sub>5</sub> in 5 days at 27°C)	mg/l max	30
5	Temperature of discharge	°C,max	Shall not exceed 40°C in any Section of the Stream within 15 m downstream from the effluent outlet.
6	Oils and greases	mg/l max	10
7	Phenolic Compounds (as C <sub>6</sub> H <sub>5</sub> OH)	mg/l max	1.0
8	Chemical Oxygen Demand (COD)	mg/l max	250
9	Colour	Wave length range 436nm( yellow range) 525nm(Red range ) 620nm(Blue range)	Maximum spectral absorption co efficient 7 m <sup>-1</sup> 5m <sup>-1</sup> 3 m <sup>-1</sup>
10	Dissolved phosphates(as P)	mg/l max	5
11	Total Kjeldahl nitrogen(as N)	mg/l max	150
12	Ammoniacal nitrogen(as N)	mg/l max	50
13	Cyanide(as CN)	mg/l max	0.2
14	Total residual chlorine	mg/l max	1.0
15	Flourides(as F)	mg/l max	2.0
15	Sulfides(As S)	mg/l max	2.0
16	Flourides, mg/l, max	mg/l max	2.0
17	Total residual chlorine mg/l, max	mg/l max	1.0
18	Arsenic( as As)	mg/l max	0.2
19	Cadmium (as Cd)	mg/l max	0.1
20	Chromium , Total ( As Cr)	mg/l max	0.1
21	Copper (as Cu)	mg/l max	3.0
22	Iron( as Fe)	mg/l max	3.0
23	Lead( as Pb)	mg/l max	0.1
24	Mercury ( as Hg)	mg/l max	0.0005
25	Nickel ( as Ni)	mg/l max	3.0
26	Selenium ( as Se)	mg/l max	0.05
27	Zinc ( as Zn)	mg/l max	5.0

28	Pesticides	mg/l max	0.005
29	Detergents /surfactants	mg/l max	5
<b>No</b>	<b>Determinant</b>	<b>Unit type of limit</b>	<b>Tolerance Limit</b>
30	Faecal coliform	MPN/100 ml ,max	40
31	Radio active material (a) Alpha emitters (b) Beta-emitters micro curie/ml	micro curie/ml,max micro curie/ml,max	10 <sup>-4</sup> 10 <sup>-7</sup>

Note 1: All efforts should be made to remove colour and unpleasant odour as far as possible.

Note 2: These values are based on dilution of effluents by at least 8 volumes of clean receiving water. If the dilution is below 8 times, the permissible limits are multiplied by 1/8 of the actual dilution.

Note 3: The above mentioned General Standards cease to apply with regard to particular industry when industry specific standards are notified for that industry.

Note 4 Pesticide as per World Health Organization (WHO) and Food and agriculture Organization (FAO) requirements.

### 2.3.3.2 Ambient Air Quality

The National Environmental (Ambient Air Quality) Regulations, published in Gazette Extraordinary, No. 850/4 of December, 1994 and has been amended by Gazette Extraordinary ,No. 1562/22 of August , 2008. The relevant Ambient Air Quality according to Gazette notification is given in Table -04

**Table -04: The National Environmental (Ambient Air Quality) Regulations**

Pollutant	*Averaging Time*	Maximum Permissible Level		Method of Measurement
		µgm-3	ppm	
1.ParticulateMatter– Aerodynamic diameter islessthan 10µminsize (PM10)	Annual	50	-	Hi-volume sampling and Gravimetric or Beta Attenuation
	24hrs	100	-	
2.ParticulateMatter– Aerodynamic diameter islessthan 2.5µm insize (PM2.5)	Annual	25	-	Hi-volume sampling and Gravimetric or Beta Attenuation
	24hrs	50	-	
3.NitrogenDioxide (NO2)	24hrs	100	0.05	Colorimetric using Saltzman Method or equivalent Gas phase
	8hrs	150	0.08	
	1hr	250	0.18	
4.SulphurDioxide (SO2)	24hrs	80	0.03	Pararosanilene Method or equivalent Pulse Flourescent
	8hrs	120	0.05	
	1hr	200	0.08	
5.Ozone(O3)	1hr	200	0.10	Chemiluminescence Method or equivalent Ultra violet photometric
6.Carbon Monoxide (CO)	8hrs	10,000	9.00	Non-Dispersive Infrared Spectroscopy”
	1hr	30,000	26.00	
	Anytime	58,000	50.00	

\*Minimum number of observations required to determine the average over the specified period—

03hour average-03 consecutive hourly average

08hour average-08hourly average

24hour average-18hourly average



Yearly average-09monthly average with at least 02monthly average each quarter.  
+ By using Chemicals or Automatic Analyzers.

### 2.3.3.3 Noise Standards

National Environmental (Noise Control) Regulations was enacted by Gazette Extraordinary, No. 924/12 of May, 1996. The Regulations cited as the National Environmental (Noise Control) Regulations No.1, 1996 suggests the maximum permissible noise levels at the boundary of the land in which any source of noise is located, shall not exceed the limits set out in the Schedules cited.

Schedule III (Regulation 4) suggests maximum permissible Noise Levels at Boundaries of the land in which the source of noise is located in Laeq'T', for construction activities as Laeq'T' Day Time 75 and Night Time 50. "Laq'T" means the equivalent continuous, A-weighted sound pressure determined over a time interval T (in dB).

Schedule I (Regulation 2) Maximum Permissible Noise Levels at Boundaries in Laeq'T'

Area	Laq T	
	Daytime	Night Time
Low Noise	55	45
Medium Noise	63*	50
High Noise	70	60
Silent Zone	50	45

\*Provided that the noise level should not exceed 60 dB (A) inside existing houses, during daytime.

### Schedule II (Regulation 3)

The following noise levels will be allowed where the back ground noise level exceed or is marginal to the given levels in Schedule I

- (a) For low noise areas in which the background noise level exceed or is marginal to the given level measured  
Back ground Noise Level+3dB(A)
- (b) For medium noise areas in which the background noise level exceeds or is marginal to the given level measured back ground Noise Level +3dB (A)
- (c) For silent zone in which the background noise level exceeds or is marginal to the given level measured  
Background Noise Level+3dB(A)
- (d) For high noise areas in which the back ground noise level exceeds or is marginal to the given level
  - (i) For day time : Measured Background Noise Level+5 dB (A)
  - (ii) For night time: Measured Background Noise Level+3 dB(A)

The above maximum noise levels should be maintained inside the boundary of the land, in which the source noise is located.

For the purposes of Schedules I and II: "Low Noise Area" means an area located within any Pradeshiya Sabha area, "Medium Noise Area" means an area located within any Municipal Council or Urban Council area, "High Noise Area" means any export processing zone established by the Board of Investment or industrial estates approved under Part IVC of the National Environmental Act. "Silent Zone" means the area covered by a distance of 100 meters from the boundary of a court house, hospital, public library, school, zoo, sacred areas and areas set apart for recreation or environmental purposes.

### 3.0 Environmental Impact & Proposed Mitigation Measures

**Table -05: Environmental Impact & Proposed Mitigation Measures (During Pre-construction/ Construction Stage/Post -Construction Period)**

Activity & Impact	Mitigation Measures	Project Phase & Location	Institutional Responsibility		Monitoring Frequency	Implementation cost	Monitoring indicator
			Implementation	Supervision			
<p><b>1.0</b> Apr. 241 numbers of trees are to be removed inside the project area <u>Package wise tree removal</u> Package -01 – 94 trees Package-02 – 21 trees Package -04 - 06 trees Package-05 – 120 trees (Annexure -01- for the details of trees to be removed )</p> <p><b>Impact –</b> Cutting and felling of trees may create sporadic high noise levels and this disturbance prevails very short period.</p> <p>Creating large hole(trench) due to removal of root area of the trees Loss of soil stability, shade and habitat Disturbance today-to-day education activities of IFSL Unexpected entrance of persons into the site during trees cutting time. Possible injury due to mechanical saw blade and felling of trees</p>	<p>Removal of existing trees in proposed the locations for new structures are inevitable. Most of trees which are identified for removal are matured exotic tree species (<i>Eucalyptus grandis</i> / <i>Acacia decurrens</i> &amp; <i>Pinus roxburhii</i>) merely planted for logging. It is suggested to plant flowering trees at suitable locations in the garden area of new buildings to enhance aesthetic beauty of IFSL and as a compensation measure for removed trees. (Annexure – 2) Sporadic/intermittent noise generation due to operation of mechanical saw and felling of trees is inevitable. But these practices are to be done inside the project area away from human settlement. Therefore special mitigatory measures are not required for the noise disturbance since it prevails very short time during removal of trees. Large holes (trench) created due to removal of trees are to be filled with soil immediately in order to avoid water logging and accidents</p>	<p>Phase Construction stage. Locations Refer Annexure-01</p>	Contractor	RDC / PMU	<p>Daily Contractor Weekly RDC / PMU</p>	<p>Paid item in the BOQ</p>	<p>- Daily check list used by the contractor &amp; complaints -Actual numbers of trees to be removed will be decided by the RDC/PMU after completion of setting out for relevant construction</p>

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Activity & Impact	Mitigation Measures	Project Phase & Location	Institutional Responsibility		Monitoring Frequency	Implementation cost	Monitoring indicator
			Implementation	Supervision			
<i>Cont.01</i>	<ul style="list-style-type: none"> <li>- All tree logs shall be handed over to the employer (Effort shall be made to utilize timber of removed trees for the timber requirement for the improvement of IFSL if regulations of forest department and State Timber corporation are allowed to do so. ).</li> <li>- No one is allowed to enter the site when tree cutting operations are carried out by means of establishing “No Entry” signage or barricading the concerned area.</li> </ul>	<u>Phase</u> Construction stage. <u>Locations</u> Refer Annexure-01	Contractor	RDC / PMU	<u>Daily</u> Contractor <u>Weekly</u> RDC / PMU	Deemed as an incidental to the work and no separate payments will be made for their implementation.	Daily check list used by the contractor & complaints
<p><b>2.0</b> Ground clearance, foundation excavation for construction of buildings, pilling , underground excavation for construction of sewerage treatment plant</p> <p><b>Impact</b></p> <ul style="list-style-type: none"> <li>- Surrounding community may affect due to noise of earth moving machineries and trucks</li> <li>- Air pollution may occur due to suspended particulate matter during excavation and stock pile of excavated earth.</li> <li>- Flash erosion may be possible due to storm water flow in an exposed area</li> </ul>	<ul style="list-style-type: none"> <li>- Sporadic/intermittent noise generation due to operation of earth moving is inevitable. But these practices are to be done inside the project area away from human settlement. The machineries shall be equipped with noise reduction gears such as silencers/mufflers and they should be maintained properly.</li> <li>- Appropriate wetting method (water sprinkling) should be applied in order suppress dust generation if required.</li> </ul>	<u>Project Phase</u> Construction stage.  <u>Location</u> Construction sites under package -01 to 05	Contractor	RDC / PMU	<u>Daily</u> Contractor <u>Weekly</u> RDC / PMU	Deemed as an incidental to the work and no separate payments will be made for their implementation.	<ul style="list-style-type: none"> <li>- Daily check list used by the contractor &amp; complaints</li> <li>- Quarterly water quality monitoring report in Manik Philla Ela canal</li> </ul>

Activity & Impact	Mitigation Measures	Project Phase & Location	Institutional Responsibility		Monitoring Frequency	Implementation cost	Monitoring indicator
			Implementation	Supervision			
<p><i>Cont.02</i></p> <ul style="list-style-type: none"> <li>- Siltation of water bodies and common drains due to run off water and due to discharging of turbid water in dewatering process of pile bored pilling ( If required )</li> <li>- According to environmental screening report, there were no special faunal habitats found in the project area. But it is reported that the dusky torque monkey (<i>Macaca sinica aurifrons</i>), sambhur(<i>Cervus unicolor</i>), barking deer (<i>Muntiacus malarbaricus</i>), Wild boar (<i>Sus scrofa</i>) black nape hare (<i>Lepus nigricollis</i>) and the mouse deer (<i>Moschiola meninha</i>) are among the faunal species in this area. Among them, mouse deer is an endemic species. Disturbances to the movements of these animals can be expected within project site and immediate vicinity.</li> <li>- Disturbance today- to- day education activities in IFSL</li> </ul>	<ul style="list-style-type: none"> <li>- As a measure for minimize soil erosion and flash erosion, the retaining walls (If proposed to be constructed) have to be constructed first before cutting sloppy ground to create required surface for foundation excavation. So that an excavated earth can be used to fill the void inside the retaining wall</li> <li>- The excess left earth should be used to fill playground area or if excess left earth is not suitable as filling materials, they should be disposed to an approved disposal site.</li> <li>- Adequate shoring at a predetermined spacing should be provided for any excavation beyond safe open excavation depth (approximately &gt; 1m).</li> <li>- Silt fencing shall be provided as required( If de-watering is required to be done )</li> <li>- Properly divert waterways/provide temporary drainage, provide manholes/gullies/grates, silt traps, drains, leader way canals following proper design guidelines.</li> </ul>						

	<p>As the terrestrial faunal species reported in this project area are highly mobile, no special measures are required for their existence/migration and allow them to move freely without making any harm.</p> <p>If a fence will be erected around the project area without keeping provisions to move animals, allow all animals to migrate into adjacent area (Outside the project area) before completion of the fence.</p>						
Activity & Impact	Mitigation Measures	Project Phase & Location	Institutional Responsibility		Monitoring Frequency	Implementation cost	Monitoring indicator
			Implementation	Supervision			
<p><b>3.0</b> Demolishing of existing structure</p> <p><b>Impact –</b></p> <ul style="list-style-type: none"> <li>- Fugitive dust and high noise levels will be emanated intermittently during demolishing work of existing structure.</li> </ul>	<ul style="list-style-type: none"> <li>- The dust which emits during demolishing of concrete structures, walls and plaster is short lived and will not spread large area and confined to short distance which may affect those who carry out relevant work and other workers working in same area. Therefore, all workers who are working in the site shall be provided with necessary personnel protective equipment (PPE) such as dust mask and ear stud/muffler. Appropriate wetting method (water sprinkling) should be</li> </ul>	<p><u>Project Phase</u> Construction stage.</p> <p><u>Location</u> Construction sites under package -01 to 05</p>	Contractor	RDC / PMU	<p><u>Daily</u> Contractor <u>Weekly</u> RDC / PMU</p>	Deemed as an incidental to the work and no separate payments will be made for their implementation.	Daily check list used by the contractor & complaints

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	<p>applied in order suppress dust generation if required.</p> <ul style="list-style-type: none"> <li>- All debris generated due to demolishing works should be disposed as per the requirement mentioned in item No .8.0.</li> <li>- There will be higher accidental risk involve with demolishing work rather than other general construction work. Therefore, wearing proper PPE and effective implementation of health and safety plan is recommended.</li> </ul>						
Activity & Impact	Mitigation Measures	Project Phase & Location	Institutional Responsibility		Monitoring Frequency	Implementation cost	Monitoring indicator
			Implementation	Supervision			
<i>Cont.03</i>	<ul style="list-style-type: none"> <li>- (Please refer Annexure-03 for health &amp; safety plan.)</li> <li>- Sporadic\intermittent noise generation will be possible during demolishing work and it will not affect to surrounding community as the project site is situated with an adequate buffer zone. Workers who are attending demolishing work may expose to considerable high noise and it will not be unbearable for the workers. But noise generation exceeds 80dBA), they shall be provided with necessary ear protection gears.</li> </ul>						

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	<ul style="list-style-type: none"> <li>- It will be ensured that the levels of intermittent vibration as per the Interim Standards for Vibration of the Operation of Machinery, Construction Activities to avoid human discomfort and inconvenience.(Refer Annexure -04) for Interim Vibration standard in Sri Lanka</li> </ul>						
Activity & Impact	Mitigation Measures	Project Phase & Location	Institutional Responsibility		Monitoring Frequency	Implementation cost	Monitoring indicator
			Implementation	Supervision			
<p><b>4.0</b> Erection of temporary labour camps within the project site</p> <p><b>Impact</b></p> <ul style="list-style-type: none"> <li>- Discharge of waste water arising from kitchen and dining area</li> <li>- Discharge of waste water /sewerage from latrine /urinal</li> <li>- Discharge of domestic solid waste arising from kitchen and dining area</li> </ul>	<ul style="list-style-type: none"> <li>- Generally; labour requirement can be sought from surrounding villages from these type of construction. Therefore; contractor may not need to maintain labour camp. But contractor shall provide dining facilities and latrines and urinals facilities at the site if available facilities in SLFI are not allowed to share.</li> <li>- If the contractor operates labour camps at his own , he shall provide and maintain necessary (temporary) living accommodation and ancillary facilities for labour (as per the requirement of factories ordinance of Sri Lanka ) according to standards and scale approved by the Engineer</li> </ul>	<p><u>Project Phase</u> Construction stage.</p> <p><u>Location</u> Construction sites under package -01 to 05</p>	Contractor	RDC / PMU	<p><u>Daily</u> Contractor <u>Weekly</u> RDC / PMU</p>	Deemed as an incidental to the work and no separate payments will be made for their implementation.	Daily check list used by the contractor& complaints

<p><i>Cont.04</i></p>	<ul style="list-style-type: none"> <li>- Sitting of labour camps shall have the Engineer's approval and shall not be located in proximity to environmentally, socially or culturally sensitive sites. Labour camps shall be well constructed with the necessary structural stability and good access compliance with the relevant regulations and guidelines issued by the Local Authority, Public Health Inspector and Factory Engineers' office of Labour department.</li> <li>- Labour camps shall be provided with necessary amenities such as water supply, electricity, bathing facilities, dining facilities latrines and urinals. Adequate protection against fire must be provided.</li> <li>- Labour camps shall be provided with adequate and appropriate facilities for disposal of sewerage and solid waste. The sewage systems shall be properly designed, built and operated so that no pollution to ground or adjacent water</li> </ul>						
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<p><i>Cont.04</i></p>	<p>bodies/watercourses takes place.</p> <ul style="list-style-type: none"> <li>- General refuse (garbage) arising from labour camp will be segregated mainly as bio-degradable waste and non-bio degradable waste. For this purpose, sufficient number of separate bins having well closing lids with clear instructions and figures should be provided in order to segregate the bio degradable waste and non-bio degradable</li> <li>- An arrangement shall be made to disposal of collected garbage daily with the coordination of Nuwara Eliya Municipal council according to their schedule of garbage collection.</li> <li>- Wastewater shall not be discharged to the ground or waterways in a manner that will cause unacceptable surface or ground water pollution. (Discharges of waste water arising from kitchen and dining area are to be equipped with oil trap system. No offensive odour is allowed.)</li> <li>- The Contractor shall ensure that all camps are kept clean and hygienic. Necessary measures shall be taken to prevent breeding of mosquitoes /vectors.</li> <li>- The Contractor shall report any outbreak of infectious disease in a labour camp to the Engineer</li> </ul>						
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<p><i>Cont.04</i></p>	<p>and the Medical Officer of Health (MOH) or to the Public Health Inspector (PHI) of the area immediately. The Contractor shall carry out all instructions issued by the authorities, if any.</p> <ul style="list-style-type: none"> <li>- All relevant provisions of the Factories Ordinance and any other relevant regulations aimed at safety and health of workers shall be adhered to.</li> <li>- The Contractor shall remove the labour camps fully after its need is over and restore the area back to its former condition.</li> </ul>						
Activity & Impact	Mitigation Measures	Project Phase & Location	Institutional Responsibility		Monitoring Frequency	Implementation cost	Monitoring indicator
			Implementation	Supervision			
<p><b>5.0 Material procurement Impacts</b></p> <ul style="list-style-type: none"> <li>-Material procurement involves harnessing loading to vehicles and transporting and it will create both noise and dust problems</li> <li>- There may be possibility of receiving foreign materials which have an impact of spreading invasive alien species of flora with the materials taken to the site for project construction.</li> </ul>	<ul style="list-style-type: none"> <li>- Material such as sand, cement, bricks, metal boulders and metal aggregates, timber, tor bars are the main materials which require for the civil construction in addition to mechanical and electrical items. When it is considered the nature of this project, most of materials are to be procured from outsource. Therefore, environmental requirements such as environmental protection license, mining license and environmental clearance must be considered as a mandatory part of source approving procedure in</li> </ul>	<p><u>Project Phase</u> Construction stage.</p> <p><u>Location</u> Approved outsource locations</p>	<p>Contractor</p>	<p>RDC / PMU</p>	<p><u>Daily</u> Contractor <u>Weekly</u> RDC / PMU</p>	<p>Deemed as an incidental to the work and no separate payments will be made for their implementation.</p>	<p>Daily check list used by the contractor &amp; complaints</p>

<p><i>Cont.05</i></p>	<p>addition to engineering requirement and standards for procure such materials.</p> <ul style="list-style-type: none"> <li>- Timber of the removed trees are encouraged to use for timber requirement of the project if they are entitled to use according to procedures and regulations of forest department and complies with civil engineering standards</li> <li>- When receiving materials to the site, it is required to screen whether they are free from invasive alien species of flora. ( When types of materials required for this project are concerned , supply of sand may be having more possibility of bringing unwanted foreign materials to the site ) If such materials are found, they must be buried underground at the suitable location to inhibit regeneration.</li> </ul>						
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Activity & Impact	Mitigation Measures	Project Phase & Location	Institutional Responsibility		Monitoring Frequency	Implementation cost	Monitoring indicator
			Implementation	Supervision			
<p><b>6.0</b> Material Transportation</p> <p><b>Impacts</b></p> <ul style="list-style-type: none"> <li>- Dust and noise together with vibrations may be very likely from the transportation of materials to the site.</li> <li>- Engagement of heavy vehicles for material transportation will create nuisance and danger to the pedestrians particularly to the school children in the schools and pre-schools.</li> </ul>	<ul style="list-style-type: none"> <li>- Trucks carrying dust generating materials shall be appropriately covered to prevent generation of dust and spill of dust generating material along the roads.</li> <li>- Trucks carrying material shall be daily cleaned as a minimum to prevent accumulation of dust generating material on their bodies and tyres.</li> <li>- Tyres of the trucks transporting material shall be washed and cleaned before entering public roads to prevent carrying of mud to roads.</li> <li>- All vehicles, equipment and machineries used for construction shall be regularly maintained in order to ensure that emission levels comply with the relevant standards stipulated under the National Environmental Act. Revenue license for the vehicles are issued after confirmation of standard by performing Vehicular Emission Test (VET).</li> </ul>	<p><u>Project Phase</u> Construction stage.</p> <p><u>Location</u> Road to approved outsource locations &amp; Internal road at project site</p>	Contractor	RDC / PMU	<p><u>Daily</u> Contractor</p> <p><u>Weekly</u> RDC / PMU</p>	Deemed as an incidental to the work and no separate payments will be made for their implementation.	Daily check list used by the contractor & complaints

<p><i>Cont.06</i></p>	<p>Therefore, usage of vehicles which bear revenue license is mandatory.</p> <ul style="list-style-type: none"> <li>- Idling of vehicles should be controlled as practical as possible in order to lessen the air pollution events.</li> <li>- It will be ensured that the levels of intermittent vibration as per clause No.8.4.3 of Interim Standards for Vibration of the Operation of Machinery, Construction Activities Vehicle Movement &amp; Traffic.. to avoid human discomfort and inconvenience.(Refer annexure-05 for interim vibration standard in Sri Lanka )</li> <li>- Advice the heavy vehicle operators / drivers to take extra care particularly near the schools and religious places.</li> </ul>						
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Activity & Impact	Mitigation Measures	Project Phase & Location	Institutional Responsibility		Monitoring Frequency	Implementation cost	Monitoring indicator
			Implementation	Supervision			
<p><b>7.0 Material storage</b></p> <p><b>Impacts</b></p> <ul style="list-style-type: none"> <li>- Emission of dust due to stockpiling and subsequent transport is very likely.</li> <li>- Erosion of material during rains; stock piling of soil, debris and other material may block surface drainage paths causing localized flooding during constructional periods.</li> <li>- If not properly stored and adequately covered, fine material washout may significantly degrade surface water quality</li> </ul>	<ul style="list-style-type: none"> <li>- Appropriate wetting method (water sprinkling) should be applied in order suppress dust generation if required. ( According to climatic condition of Nuwara Eliya , dust generation from stock pile of left earth or exposed earth would be minimal )</li> <li>- All construction materials (sand, gravel, aggregates, cement) should be stored at designated places in the project area in a way not to be washed during raining.</li> <li>- Erosion control practices should be implemented, where necessary to limit turbidity and silt transport off site. Material recycling and proper scheduling of ordering and disposal should be promoted to avoid unnecessarily maintaining material/debris stockpiles for extended periods.</li> </ul>	<p><u>Project Phase</u> Construction stage.</p> <p><u>Location</u> Construction sites under package -01 to 05</p>	Contractor	RDC / PMU	Daily Contractor Weekly RDC / PMU	Deemed as an incidental to the work and no separate payments will be made for their implementation.	Daily check list used by the contractor& complaints

Activity & Impact	Mitigation Measures	Project Phase & Location	Institutional Responsibility		Monitoring Frequency	Implementation cost	Monitoring indicator
			Implementation	Supervision			
<p><b>8.0</b> Disposal of Debris. Spoil, excess Earth, etc.</p> <p><b>Impacts</b></p> <ul style="list-style-type: none"> <li>- Obstruction of natural drainage system and creating localized flood</li> <li>- Siltation and increase of turbidity of stream and canal as a result of mixing eroded fine particles</li> <li>- Breeding vectors and mosquitoes if water stagnation takes place in disposed materials</li> </ul>	<ul style="list-style-type: none"> <li>- The Contractor shall propose locations of disposal of debris, spoils and excess earth to the Engineer for his approval. Such sites shall be environmentally acceptable and/or approved by the relevant Local Authority or other relevant authorities such as CEA, Nuwaraeliya Municipal Council and GS&amp;MB if the clearance is required under regulation of those concerned authorities.</li> <li>- Removed materials from demolishing work should be stocked piled in suitable place until they are disposed to an approved disposal site and maximum effort must be made to send them for reuse and recycle.</li> <li>- The contractor shall ensure that the maintenance of disposal site complies with (i) waterways and drainage paths are not blocked; (ii) the disposed material should not be washed away by floods or storm water and (iii) should not be a nuisance to the public.</li> </ul>	<p><u>Project Phase</u> Construction stage.</p> <p><u>Location</u> Approved disposal sites</p>	Contractor	RDC / PMU	Daily Contractor Weekly RDC / PMU	Deemed as an incidental to the work and no separate payments will be made for their implementation.	Daily check list used by the contractor & complaints

## Environmental Management Plan

Activity & Impact	Mitigation Measures	Project Phase & Location	Institutional Responsibility		Monitoring Frequency	Implementation cost	Monitoring indicator
			Implementation	Supervision			
<p><b>9.0</b> Civil construction, mechanical and electrical works</p> <p><b>Impacts</b></p> <ul style="list-style-type: none"> <li>- Mixing concrete using concrete mixing machine or truck mixtures, cutting and drilling of materials may create sporadic noise and this disturbance prevails very short period.</li> <li>- Dust generation may possible when preparation of concrete using concrete mixing machine ,cutting and drilling of materials.</li> </ul>	<ul style="list-style-type: none"> <li>- No special mitigation measures are needed as these disturbances will prevail very short time and noise and dust emission are relatively low.</li> <li>- Good housekeeping practices are encouraged.</li> </ul>	<p><u>Project Phase</u> Construction stage.</p> <p><u>Location</u> Construction sites under package -01 to 05</p>	Contractor	RDC / ESCAMP	Daily Contractor Weekly RDC / PMU	Deemed as an incidental to the work and no separate payments will be made for their implementation.	Daily check list used by the contractor& complaints
<p><b>10.0</b> Maintenance after Construction</p> <p><b>Impact -</b></p> <ul style="list-style-type: none"> <li>- Water stagnation may possible in gutters as a result of obstruction of free water flow due to depositing leaves of trees in gutters.</li> <li>- Fecal contaminant may be possible in 02 wells which are used as an additional water source.</li> </ul>	<ul style="list-style-type: none"> <li>- Gutter clearing process should be done at least once in three months.</li> <li>- Wall around the well should be constructed.</li> <li>- Water quality test for the well water should be done monthly in order to confirmation of possible fecal contaminant.</li> </ul>	<p><u>Project Phase</u> Post Construction stage.</p> <p><u>Location</u> IFSL</p>	IFSL	IFSL	Monthly IFSL	SCAMP	Water quality test



## **4.0 Grievance Redress Mechanism (GRM)**

A project-specific grievance redress mechanism will be established to receive, evaluate and facilitate the resolution of affected persons (AP) concerns, complaints and grievances about the social and environmental impacts at all the levels of the project. The GRM will aim to provide a time-bound and transparent mechanism to voice and resolve social and environmental concerns linked to the project. Expected issues are mostly from the construction activities which can be amicably settled by both parties. In the case of grievances that are immediate and urgent in the perception of the complainant, the contractor and supervision personnel from the PMU/RDC on site will provide the most easily accessible contact for quick resolution of such grievances. Contact phone numbers and names of the contractor's EO, Public Relation Officer (PRO), site engineer and other relevant responsible officers of the contractor will be posted at the construction sites in visible locations.

All complaints are documented and keep complaint register with the actions taken. The description of complain and corresponding actions shall be presented in monthly progress meeting. The engineer and RDC should advise and assist if there are complaints which cannot be resolved by the contractor alone.

## **5.0 EMAP implementation responsibilities and costs**

Overall responsibility of ensuring the compliance of the project activities with environmental requirements and safeguards rests with the PMU and RDC. The RDC shall appoint an environmental officer to look into satisfactory implementation of EMAP and advice to relevant stake holders on environmental management of the project. He/she shall be a competent person who is graduated in related discipline of environment /science with more than 03 years' experience in environmental management. The environmental officer of the RDC reports to the Project Director and responsible for environmental management functions of the project during construction period.

The contractors shall employ an Environmental Officer who shall be a graduate in related discipline of environment /science and he /she shall (i) prepare Environmental Management Action Plan (EMAP) to comply with the requirements indicated in Table -05 . (ii) coordinate with RDC on updating the EMAP based on detailed design and (iii) ensure implementation of EMAP during construction.

Implementation of environmental safeguards will be built into the contracts. EMAP is to be prepared addressing environmental and social issues of each components of the project complying the requirements in EMP (Table -05) which will be a part of the scope of work of the contract.

This Environmental Management Plan (EMP) will guide environmentally and socially sound construction of the project and will ensure development of efficient lines of communication system between PMU, IFSL, RDC and the contractor. The EMP identifies activities during: (i) site preparation and pre-construction activities, (ii) construction stage; and (iii) post-construction and operation stage of the project.

Although, the assigned responsibilities are expressed separately for each institution, the ultimate objective expected from all the above institutions is to carry out the project construction in a way that will not create significant impact on the environment. Issues related to environmental and social safeguard implementation, outcomes of environmental and social monitoring should be discussed at

monthly progress review meeting and action plans should be developed by the contractor to address the unresolved issues.

Monthly progress report based on implementation of EMAP shall be prepared by the EO of the Contractor and submitted to RDC while EO of the RDC shall submit quarterly environmental progress report to PMU.

Most of the mitigation measures described in the EMP are deemed as an incidental to construction work and included in the contract. However, the following costs need to be considered as specific costs related to EMAP. (Refer Table -6)

It is suggested to perform an ambient air quality monitoring at site premises and water quality monitoring at Manik Philla Ela canal as an impact monitoring measure for identifying any moderate condition in aquatic environment which may be caused due to construction activities .For example; if changes in water quality is found, it may suspect that the reason for those changes due to project activities. But other human activities prevailing in surrounding area such as ground preparation for vegetable cultivation may result for these changes. Therefore, if any moderate condition is found in water quality monitoring, the possibility of causing that effect in respect of project activities can be investigated and corrective measures can be taken accordingly.

**Table -06 :Cost for Special Activities in Implementation of EMAP**


<b>Mitigation Measure</b>	<b>Location</b>	<b>Parameters</b>	<b>Cost</b>
Quarterly water quality monitoring including initial water quality monitoring as base line information before commencement of the construction.	Manik Philla Ela canal	PH, Temp., TSS, Turbidity , Conductivity DO, BOD <sub>5</sub> ,COD,	75,000.00
Quarterly Ambient air quality monitoring including initial ambient air quality monitoring as base line information before commencement of the construction.	Site premises	PM <sub>10</sub> ,PM <sub>2.5</sub> ,NO <sub>2</sub> ,SO <sub>2</sub> ,O <sub>3</sub> , Co	300,000.00

## 6.0 Conclusion and Screening Decision

The proposed project can be considered as rehabilitation and improvement of existing infrastructure of IFSL. The removal of 241 number of trees, excavation for ground preparation and demolishing of some parts of the buildings are the main contributory factors for the negative environmental impacts. Most the trees which are to be removed are exotic matured trees planted for economical logging. The area which is subjected for removal of trees and clearing of land is less than 1 hectare. Hence, this project does not require an approval under Environmental impact assessment procedure described in part IV(C) of National Environmental Act No.47 of 1980. But it is recommended to obtain clearance from CEA for the implementation of the project.

Most of the environmental impacts described in above Table -05 caused by project activities are not expected to have any significant impact and are related to dust/noise generation, siltation, safety hazards and other general impacts which can be mitigated with good construction, site management and public safety practices.

### Signature

<b>Prepared by</b>  R.M.C Ranmandala(M.Sc (Envt. Sc) , B.sc , C.EnvP) Environmental Specialist Resource Development Consultancy (Pvt) Ltd	<b>Date:</b> 12.08.2019  
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