CONTRACTOR’S ENVIRONMENTAL MANAGEMENT PLAN FOR REHABILITATION OF AGARAK-2 SUBSTATION
Table of Contents

1. EXECUTIVE SUMMARY ............................................................................................................. 4
2. PROJECT DESCRIPTION .................................................................................................................. 5
   2.1 Description of the proposed construction works ................................................................. 6
   2.2 Proposed timing/duration of works ................................................................................. 10
   2.3 Project schedule and milestones .................................................................................. 10
   2.4 Types of equipment to be used on site ......................................................................... 10
3. LEGISLATION REQUIREMENTS ................................................................................................ 10
   3.1 ADB Environmental Assessment Requirements ............................................................ 10
   3.2 Armenian Laws Governing Environmental Management and Assessment ................... 14
   3.3 Armenia's Participation in International Environmental Conventions and Protocols ...... 20
   3.4 Administrative Framework .......................................................................................... 21
4. DESCRIPTION OF EXISTING ENVIRONMENTAL CONDITIONS ........................................ 24
   4.1 Climate ............................................................................................................................. 24
   4.2 Relief ............................................................................................................................... 24
   4.3 Soil and land use ............................................................................................................. 24
   4.4 Seismicity ......................................................................................................................... 26
   4.5 Hydrology ........................................................................................................................ 27
   4.6 Biodiversity ..................................................................................................................... 29
5. IMPACT ASSESSMENT ................................................................................................................ 33
   5.1 Introduction ....................................................................................................................... 33
   5.2 Construction Impacts ........................................................................................................ 35
6. MITIGATION MEASURES ....................................................................................................... 38
   6.1 Mitigation Measures for the Construction Phase ............................................................. 42
7. Monitoring ............................................................................................................................... 61
7.1 Environmental Monitoring and Monitoring Schedule

8. RESPONSIBILITIES FOR IMPLEMENTATION MITIGATION MEASURES AND MONITORING

8.1 Institutional Responsibilities

8.2 General responsibilities of the Contractor for Managing the CEMP

9. RESPONSIBILITIES FOR REPORTING AND REVIEW

9.1 Contractor’s Environmental Report

9.1.1 Supporting Documents for the CER

9.2 Revision of CEMP Document

9.3 Complaints Register

10. ENVIRONMENTAL TRAINING AND AWARENESS

11. ENVIRONMENTAL RESPONSIBLE PROCUREMENT

12. Public Consultation and communication

13. Accountability & Grievance Redress Mechanism

13.1 ADB’s Accountability Mechanism

13.2 Grievance Redress Mechanism

14. References and sources of information
1. EXECUTIVE SUMMARY

This Contractor’s Environmental Management Plan (CEMP) has been developed for the rehabilitation of Agarak-2 substation located in Agarak community of Syunik marz of RA.

The high-voltage transmission network of Armenia consists of 220 kV and 110 kV power lines with total length of approximately 4,500 km. There are one (1) Substation of 330 kV and fourteen (14) substations of 220 kV owned by High Voltage Electric Networks (HVEN), as well as one hundred nineteen (119) substations of 110 kV, which are mainly owned by Electric Network of Armenia CJSC (ENA), a power distribution company (some individual 110 kV S/S are also owned by HVEN). The System Operator in Armenia is called EPSO.

The transmission infrastructure in the country is old and under-maintained. The average age of transmission assets is 45 years. HVEN estimates that around 520 km, or 33% of the 220 kV transmission lines (conductors, pylons, concrete foundations, insulators and other key pieces of infrastructure), need urgent rehabilitation. The Government with the support of donors, partially rehabilitated the 220 kV substations; however, several pieces of critical equipment in those substations (e.g. relay protection, circuit breakers, etc.) remained to need urgent rehabilitation or replacement in order to increase the reliability of power supply in the country.

Originally, eight (8) substations were foreseen to be rehabilitated with funding by ADB: Ararat-2, Yeghegnadzor, Agarak-2, Shinuhayr, Lichk, Shahumyan, Zovuni and Marash.

In the course of the technical feasibility study, four (4) substations were selected to be refurbished in the first Phase of the Project: Ararat-2, Shinuhayr, Agarak-2 and Yeghegnadzor. The remaining substations are expected to be rehabilitated at a later phase.

Out of the aforementioned four (4) substations, Agarak-2 and Shinuhayr were put forward for funding by ADB while Ararat-2 along with Yeghegnadzor are expected to be financed by other sources.

Thus, this Package consists in the rehabilitation of the substations Shinuhayr and Agarak-2.

It has been assessed that most of the potential impacts will be during the Construction Stage; these will be temporary in nature and can be managed effectively with the presented mitigation measures. The CEMP and monitoring program will be implemented by the contractor during the construction period.

Negative environmental impacts might be caused during the construction works. Environmental impacts during the construction phase will include the following: degradation of soil, landscape and soil erosion due to improper disposal of excavated materials and construction wastes; removal of the old asphalt; spillage of oil and other
substances during the construction; pollution of soil by construction run-offs; use of temporary construction sites (access roads, camps, machinery sites, storage facilities, etc.); extraction of aggregate material, such as gravel, sand, rock; temporary air pollution related to increased truck traffic during the construction, release of dust from digging-loading works and heavy machinery operation; noise and vibration disturbances; safety hazards during implementation of construction works. The likely adverse environmental impacts during the operation phase mostly include impacts on soil as a result of improper maintenance of vehicles and equipment.

2. PROJECT DESCRIPTION

The project will upgrade the national power system operation's reliability and efficiency, and enhance transmission capacity. The project will include three main components: (i) expansion of supervisory control and data acquisition (SCADA) system, (ii) rehabilitation of two existing 220-/110-kilovolt (kV) substation, and (iii) support for institutional development, capacity building, and project management.

The project will increase the electricity supply to urban and rural consumers to support inclusive and sustainable economic development. The core problems in Armenia’s energy sector are the low efficiency of energy resources utilization. Much of the sector’s
infrastructure was built during the Soviet era and has deteriorated significantly because of a lack of sufficient funding for rehabilitation and maintenance. The average age of power transmission assets is 45 years, distribution assets 32 years. Much of the existing transmission infrastructure has reached the end of its useful life and requires major rehabilitation or replacement to continue reliable operation.

The poor condition of these assets leads to a higher risk of system outages, high-maintenance costs, and reduced production efficiency. The inefficiency of power infrastructure results in higher consumption of imported fuels and reduced competitiveness. In case of any fault on the existing transmission network, a large power deficit will be incurred in populated areas and have considerable social and economic impacts. Additionally, a reliable transmission network with modern equipment is essential to ensure the safe and stable operation of the Armenia Nuclear Power Plant (400 megawatts), as well as the requirement for enhancing power export to the neighbouring countries.

To reduce such impacts, substantial investments on power sector infrastructure including generation, transmission, and distribution are undergoing. Private sector investment focuses on the rehabilitation of power generation plants and distribution networks, which are owned and operated by the private sector. A part of the high-voltage transmission lines and substations were partially rehabilitated in the past years, and investment on high-voltage transmission lines by other development partners will continue. The first stage of SCADA and energy management system (EMS) was also established in the control center. These SCADA and EMS systems presently only achieve the basic function and need to be upgraded and expanded in order to achieve full functions and efficiency. Investment on substations was not sufficient compared with the system rehabilitation requirements, thus limiting system operational functions and reliability. Expansion of the SCADA system and rehabilitation of the remaining aging transmission assets are urgently required.

The project will increase the efficiency of power system operation and reduce transmission losses, which are essential to improve energy security and reduce emissions of greenhouse gases. Rehabilitation of existing substations will improve the reliability and quality of power supply to urban and rural consumers, alleviating regional disparities within Armenia and supporting for inclusive and sustainable economic development. In addition, an efficient and reliable power system will facilitate expanding cross-border power trade in the region.

2.1 Description of the proposed construction works

It is a relatively new substation and such the works are generally limited to the adaptation works necessary for the upgrading of the substations and the installation of new equipment.

The project construction area presented bellow in the layout of Agarak-2 substation
The existing substation building can be used in continuation, but some inside works are necessary for the installation of the new equipment.

The main civil works are, but not limited to, the following:
• reconstruction and adaptation of the existing substation service building in view of the installation of new equipment and creation of areas for sanitary, office, tea kitchen, etc., execution of finishing works on the existing plinths, internal repainting of the building, adjustment of the internal floor slab or parquet according to the new situation and equipment installed
• construction of new workshop and storage building (app. 70m²)
• construction of new two-storey guardhouse (app. 5mx5m)
• installation of air-conditioning system for the control building, workshop building and guardhouse (cooling and heating)
• foundation for a new autotransformer and new 6/6kV regulating transformer including oil collector with oil separator system
• foundations for oil reserve tanks with leakage connection to the oil separator
• supply and installation of oil reserve tanks (2 x 40 m³)
• dismantling/removal works and transport to storage (incl. necessary precaution for handling of special materials)
• the handling and disposal of cement asbestos roof (around 80 square meter) and cement asbestos pipeline (around 2 meter)
• removal of metal scraps (around 12 tones)
• removal of existing 200 pieces batteries (36 pieces of LCI-4/OP batteries for coupling transformer and 164 pieces batteries of LCI-3/OP for auxiliary power supply) to HVEN
• foundations of the gantry structures
• removal of existing foundations so far necessary for the installation of new foundations
• cleaning and levelling of substation site area
• foundations for the new HV equipment as well as supply and erection of new supporting steel structures
• rehabilitation of existing but damaged gantry and various equipment foundations
• construction of a new rain water drainage system for the complete substation area, including also the dewatering of cable channels, as well as a discharge system to the outdoor area, as requested and approved by the Employer
• installation of fire detection, alarm and fighting system for new autotransformer including water reservoir (minimum 150 m³)
• installation of fire detection, alarm and fighting system at substation buildings
• installation of fire protective wall for new autotransformer
• removal of all existing fences and gates including foundations
• construction of a new external stone fence, its plastering from both sides and painting with water-proof paint
• supply and installation of new gates
• supply and installation of new lattice fence -with gate(s)- so as to separate the 110kV switchyard from 220kV one
• Carry out geotechnical investigations, take samples and make in-situ test for buildings to be constructed, as per local standards and regulations
  • covering by 15 cm. high gravel, where required and instructed by the IA
  • landscaping and/or covering by grass of the substation area according to the instructions of the Employer
  • in the rehabilitation of existing damaged roads (external approximately length of 500 m and internal and service ones) and construction of new roads and service roads
  • replacement of existing cable trenches and ducts, including covering plates, and installation of new cable trenches and ducts including covering plates
  • all existing steel structures, gantries and foundations shall be rehabilitated. Steel structures and gantries have to be provided with new, long time resistant corrosion protection. This activity includes also the complete removal of all old corrosion protections.
  • replacement of the outdoor lighting system
  • replacement and/or construction of drinking water supply system (of approximately 150m) and of the related sewage system for all substation buildings
  • installation of oil collector system for the collection of leakages with oil separator connected by a pipe system with transformer foundation collecting pits and with the oil reserve tanks
  • construction of rest rooms in the existing control building
  • construction of 6 kV room in the existing control building
  • construction of room for 3 auxiliary transformers in the existing control building
  • supply and installation of fire fighting system including installation of pumping system, hydrant system
  • installation of protective wall (1m x 20m) against external flooding
  • supply and installation of all necessary gantries and steel structures for extension of substation
  • installation of new outdoor lighting for 220 kV, 110 kV switchyards and for substation roads
  • extension and rehabilitation of the complete existing earthing system & lightning protection system for all substation areas and buildings
  • construction of new open storage area with lattice fence and gate
  • disposal of garbage at location suggested by the Agarak community (the permit for dumping site was obtained from Head of Agarak community and the non-official translation are presented at the Annex 1)
  • Installation of protective wall
  • Walls to be rehabilitated and new installed in the buildings shall be externally plastered and painted with water-proof paint. Doors to be replaced and new installed shall be of metal filled plastic, windows – double glazed (brown), roofs – coloured corrugated sheets, floors – press granite.
2.2 Proposed timing/duration of works

Proposed work activities will take 885 days in accordance to the Contract between HVEN and LEEEC signed in 06 May 2016.

2.3 Project schedule and milestones

Project schedule and milestones are presented in the Annex 6.

2.4 Types of equipment to be used on site

For rehabilitation of Agarak-2 substation will be used the following machinery and equipment:

- One Autocrane “Ivanovets”
- One Mercedes-Benz Sprinter 310D
- One Kamaz -5511
- One Kamaz 53212 (manipulator)
- Two Kamaz 5410
- One Kamaz 65115 (Truck)
- One Zil MMZ-450 (Truck)
- One Renault Magnum 420 TI (Truck)
- One Excavator CAT- 428F

3. LEGISLATION REQUIREMENTS

3.1 ADB Environmental Assessment Requirements

The ADB has three safeguard policies that seek to avoid, minimize or mitigate adverse environmental impacts and social costs to third parties, or vulnerable groups as a result of development projects1.

Safeguard Requirements 1: Environment.

The objectives are to ensure the environmental soundness and sustainability of projects, and to support the integration of environmental considerations into the project decision-making process. Environmental safeguards are triggered if a project is likely to have potential

---

1ADB. 2009. Safeguard Policy Statement, Manila
environmental risks and impacts. Eleven ‘Policy Principles’ have been adopted as part of the
SPS, including:

1. Use a screening process for each proposed project, as early as possible, to
determine the appropriate extent and type of environmental assessment so that
appropriate studies are undertaken commensurate with the significance of potential
impacts and risks. (*The Project was initially screened by the ADB and classified as a
Category B project*)

2. Conduct an environmental assessment for each proposed project to identify
potential direct, indirect, cumulative, and induced impacts and risks to physical,
biological, socioeconomic (including impacts on livelihood through environmental
media, health and safety, vulnerable groups, and gender issues), and physical
cultural resources in the context of the project’s area of influence. Assess potential
transboundary and global impacts, including climate change. Use strategic
environmental assessment where appropriate. (*The IEE herewith provides the
environmental assessment for the Project. Transboundary impacts are not
applicable*)

3. Examine alternatives to the project’s location, design, technology, and
components and their potential environmental and social impacts and document the
rationale for selecting the particular alternative proposed. Also consider the no
project alternative. (*Alternatives have been considered, including the “no project”
alternative*).

4. Avoid, and where avoidance is not possible, minimize, mitigate, and/or offset
adverse impacts and enhance positive impacts by means of environmental planning
and management. Prepare an environmental management plan (EMP) that includes
the proposed mitigation measures, environmental monitoring and reporting
requirements, related institutional or organizational arrangements, capacity
development and training measures, implementation schedule, cost estimates, and
performance indicators. Key considerations for EMP preparation include mitigation
of potential adverse impacts to the level of no significant harm to third parties, and
the polluter pays principle. (*The IEE herewith includes an EMP that has been
prepared for the Project*)

5. Carry out meaningful consultation with affected people and facilitate their
informed participation. Ensure women’s participation in consultation. Involve
stakeholders, including affected people and concerned nongovernment
organizations, early in the project preparation process and ensure that their views
and concerns are made known to and understood by decision makers and taken into
account. Continue consultations with stakeholders throughout project implementation as necessary to address issues related to environmental assessment. Establish a grievance redress mechanism to receive and facilitate resolution of the affected people’s concerns and grievances regarding the project’s environmental performance. *(The IEE herewith includes the section on consultations and a description of the Project grievance redress mechanism)*

6. Disclose a draft environmental assessment (including the EMP) in a timely manner, before project appraisal, in an accessible place and in a form and language(s) understandable to affected people and other stakeholders. Disclose the final environmental assessment, and its updates if any, to affected people and other stakeholders. *(This IEE and its EMP upon approval will be disclosed on the websites of IA/EA and ADB)*

7. Implement the EMP and monitor its effectiveness. Document monitoring results, including the development and implementation of corrective actions, and disclose monitoring reports. *(The IEE and its EMP outline a plan to monitor the implementation of the EMP and the institutional responsibilities for monitoring and reporting throughout the Project lifecycle)*

8. Do not implement project activities in areas of critical habitats, unless (i) there are no measurable adverse impacts on the critical habitat that could impair its ability to function, (ii) there is no reduction in the population of any recognized endangered or critically endangered species, and (iii) any lesser impacts are mitigated. If a project is located within a legally protected area, implement additional programs to promote and enhance the conservation aims of the protected area. In an area of natural habitats, there must be no significant conversion or degradation, unless (i) alternatives are not available, (ii) the over all benefits from the project substantially outweigh the environmental costs, and (iii) any conversion or degradation is appropriately mitigated. Use a precautionary approach to the use, development, and management of renewable natural resources. *(No critical habitats have been identified that would be significantly impacted by the Project)*

9. Apply pollution prevention and control technologies and practices consistent with international good practices as reflected in internationally recognized standards such as the World Bank Group’s Environmental, Health and Safety Guidelines. Adopt cleaner production processes and good energy efficiency practices. Avoid pollution, or, when avoidance is not possible, minimize or control the intensity or load of pollutant emissions and discharges, including direct and indirect greenhouse gases emissions, waste generation, and release of hazardous materials from their production, transportation, handling, and storage. Avoid the
use of hazardous materials subject to international bans or phase-outs. Purchase, use, and manage pesticides based on integrated pest management approaches and reduce reliance on synthetic chemical pesticides. *(The IEE and its EMP outline specific mitigation and monitoring measures to prevent and control pollution).*

10. Provide workers with safe and healthy working conditions and prevent accidents, injuries, and disease. Establish preventive and emergency preparedness and response measures to avoid, and where avoidance is not possible, to minimize, adverse impacts and risks to the health and safety of local communities. *(The IEE and its EMP outline the requirement for specific Occupational Health and Safety Plan and Emergency Response Plan).*

11. Conserve physical cultural resources and avoid destroying or damaging them by using field-based surveys that employ qualified and experienced experts during environmental assessment. Provide for the use of “chance find” procedures that include a pre-approved management and conservation approach for materials that may be discovered during project implementation. *(The IEE and its EMP outline the requirement for specific chance find procedure).*

**Safeguard Requirements 2: Involuntary Resettlement.**

The objectives are to avoid involuntary resettlement wherever possible; to minimize involuntary resettlement by exploring project and design alternatives; to enhance, or at least restore, the livelihoods of all displaced persons in real terms relative to pre-project levels; and to improve the standards of living of the displaced poor and other vulnerable groups. The safeguard requirements underscores the requirements for undertaking the social impact assessment and resettlement planning process, preparing social impact assessment reports and resettlement planning documents, exploring negotiated land acquisition, disclosing information and engaging in consultations, establishing a grievance mechanism, and resettlement monitoring and reporting.

The involuntary resettlement requirements apply to full or partial, permanent or temporary physical displacement (relocation, loss of residential land, or loss of shelter) and economic displacement (loss of land, assets, access to assets, income sources, or means of livelihoods) resulting from (i) involuntary acquisition of land, or (ii) involuntary restrictions on land use or on access to legally designated parks and protected areas. Resettlement is considered involuntary when displaced individuals or communities do not have the right to refuse land acquisition that result in displacement. A land acquisition and resettlement plan (LARP) has been prepared for the Project to ensure compliance with the safeguard on Involuntary Resettlement.

**Safeguard Requirements 3: Indigenous Peoples.**
The objective is to design and implement projects in a way that fosters full respect for Indigenous Peoples' identity, dignity, human rights, livelihood systems, and cultural uniqueness as defined by the Indigenous Peoples themselves so that they (i) receive culturally appropriate social and economic benefits, (ii) do not suffer adverse impacts as a result of projects, and (iii) can participate actively in projects that affect them.

For operational purposes, the term Indigenous Peoples is used in a generic sense to refer to a distinct, vulnerable, social and cultural group possessing the following characteristics in varying degrees:

1. self-identification as members of a distinct indigenous cultural group and recognition of this identity by others;
2. collective attachment to geographically distinct habitats or ancestral territories in the project area and to the natural resources in these habitats and territories;
3. customary cultural, economic, social, or political institutions that are separate from those of the dominant society and culture; and
4. a distinct language, often different from the official language of the country or region.

In considering these characteristics, national legislation, customary law, and any international conventions to which the country is a party will be taken into account.

Guidelines provide a rational approach for determining environmental category of the Project, the need for public consultation and disclosure, environmental management planning, and resolving involuntary resettlement, indigenous people and gender issues.

Activities carried out under the project needs to conform to current laws in Tajikistan and sound social and environmental principles. In general, the project activities will not trigger serious impacts on physical and human environment.

3.2 Armenian Laws Governing Environmental Management and Assessment

The 12th Article of the Constitution of the Republic of Armenia (adopted in 1995 and amended in 2005 and 2015) stipulates that the State is responsible for environmental protection, reproduction and wise use of natural resources following the principals of sustainable development.

Since 1991 more than 25 codes and laws as well as numerous by-laws and regulations have been adopted to protect the environment.

Summaries of several codes and laws from the list, which are most relevant to the proposed project are presented below:

Article 12th of the law defines the general requirements for ensuring sanitary and epidemic safety of the RA population in the area of planning and landscaping residential territories. Further in its article 18th it specifies the general requirements for ensuring sanitary and epidemic safety of the RA population in the area of ensuring favorable sanitary conditions in residential areas, including responsibilities for ensuring favorable sanitary conditions. The law mentions that the procedures and the conditions for ensuring and controlling sanitary condition of residential areas shall be established and carried out by local self-government bodies of state administration. It also defines that the enterprises, companies, organizations and shall ensure sanitary norms in the process of collection, recycling, reusing, disinfection and citizens burying the waste.


This Law regulates the emission licenses and provides maximum allowed loads/concentrations for atmospheric air pollution, etc. There is secondary legislation that establishes sanitary norms for noise in workplaces, residential and public buildings, residential development areas as well as construction sites.


The Laws on Flora and Fauna outline the Republic's policies for the conservation, protection, use, regeneration, and management of natural populations of plants and animals, and for regulating the impact of human activities on biodiversity. These laws aim for the sustainable protection and use of flora/fauna and the conservation of biodiversity. There are provisions for assessing and monitoring species, especially rare and threatened species.

Land Code (2001)

The Land Code defines the main directives for management use of the state lands, included those allocated for various purposes, such as agriculture, urban construction, industry and mining, energy production, transmission and communication lines, transport and other purposes. The Code defines the lands under the specially protected areas as well as forested, watered and reserved lands. It also establishes the measures aimed to the lands protection, as well as the rights of state bodies, local authorities and citizens towards the land.


The Law establishes the structure and authorities of the local self-government (hereinafter - the Communities or Municipal Administrations). In addition to the responsibilities delegated to the Communities by the Article 11th of the Law, the article 38th sets forth their mandatory powers in the area of public utilities and amenities, which includes organization of refuse collection.

The main purpose of the Water Code is to provide the legal basis for the protection of the country's water resources, the satisfaction of water needs of citizens and economic sectors through effective management of water resources and safeguarding the protection of water resources for future generations. The Water Code addresses the following key issues: responsibilities of state/local authorities and public, development of the national water policy and national water program, water cadastre and monitoring system, public access to the relevant information, water use and water system use permitting systems, transboundary water resources use, water quality standards, hydraulic structures operation safety issues, protection of water resources and state supervision.


The law regulates legal and economic relations connected to the collection, transfer, maintenance, development, reduction of volumes, prevention of negative impact on human health and environment. The law defines objects of waste usage, the main principles and directions of state policy, the principles of state standardization, inventory, and introduction of statistical data, the implementation of their requirements and mechanisms, the principles of wastes processing, the requirements for presenting wastes for the state monitoring, activities to decrease the amount of the wastes, including nature utilization payments, as well as the compensation for the damages caused to the human health and environment by the legal entities and individuals, using the wastes, as well as requirements for state monitoring and legal violations. The law defines the rights and obligations of the state governmental and local governmental bodies, as legal entities and individuals.


In addition, legal provisions on protection of workers from specific occupational hazards are contained in various separate legislative enactments, such as the Act on Prevention of Disease Caused by the Human Immunodeficiency Virus or the Fire Safety Act.

The functions, rights and duties of the labour inspectors are set out in the State Labour Inspectorate Act. Besides, the Criminal Code of Armenia provides for penalties for violations of occupational safety and health laws and regulations.

Article 4 of the Labour Code stipulates that the labour legislation of the Republic of Armenia consists of the Constitution, the Labour Code, other laws as well as Government of Armenia (GOA) Decrees which have the power of the law and contain labour norms, orders
and instructions of the President of the Republic of Armenia, GOA decrees and decrees of the Prime-Minister of the Republic of Armenia

According to RA labour laws the employer is in charge of accident response on a job site. This means that the construction contractor is responsible for providing emergency treatment, transportation to hospital etc. He is also responsible to investigate the causes of accidents, make arrangements to mitigate risks identified, adapt working procedures, etc. and fulfil legal reporting requirements.

The Contractors in their role as Employers have to adhere to Armenian labour legislation (such as the Labour Code of the Republic of Armenia) in order to ensure compliance with maximum work duration, overtime, work at night, rest periods, holidays, minimum wage, etc.

The Construction contractor shall provide an information pamphlet to all workers explaining applicable basic rights and labour safeguards. In the pamphlet also the grievance mechanisms associated with the project shall be presented.

**Law on Environmental Oversight (2005)**

The Law regulates the issues of organization and enforcement of oversight over the implementation of environmental legislation of the Republic of Armenia, and defines the legal and economic bases underlying the specifics of oversight, the relevant procedures, conditions and relations, as well as environmental oversight in the Republic of Armenia. The existing legal framework governing the use of natural resources and environmental protection includes a large variety of legal documents. Governmental resolutions are the main legal instruments for implementing the environmental laws. Environmental field is also regulated by presidential orders, Prime-Minister’s resolutions and ministerial decrees.

**Code on Underground Resources (2002)**

This Code contains the main directives for use and protection of mineral resources and underground water, including the sanitary protection zones for the underground water resources.

**Law on Inspection of Use and Protection of Land (2008)**

This law provides objectives and types of effective use and protection of lands of the Republic of Armenia, inspection related to enforcement of land legislation and institutions, procedures of control, rights and responsibilities of entities controlling land use and protection. The law applies to all lands of the Republic of Armenia Land Fund, irrespective of purpose, ownership and/or right to use.
Law on Refuse Collection and Sanitary Cleaning (2011)

This Law that was adopted in 2011 regulates waste collection and sanitary cleaning and establishes main principles of waste collection fees and tariffs, rights and obligations of service recipients as well as payment procedure. As such it regulates one of the key principles: that waste management and sanitary services shall be paid services. The Law also provides requirements to waste collection, storage and disposal.

Law on Environmental Impact Assessment and Expertise (2014)

The Law on Environmental Impact Assessment and Expertise adopted in 2014, provides legal basis for implementation and introduction of state expertise of planned activities and concept frameworks as well as presents the standard steps of the environmental impact assessment (EIA) process for various projects and activities in Armenia. It establishes in Article 14, the general legal, economic, and organizational principles for conducting mandatory state EIA of various types of projects and concept documents, according to which the concept documents related to socio-economic, energy, urban construction, transport, communication, agriculture, mining, industry, healthcare, environment, recreation, service, forestry, waste management, water economy areas are subject to strategic assessment and expertise. In addition, the section 4 of the same Article defines design documentation for various types of proposed activities. According to the Law, the proposed activities by sectors subject to assessment and environmental expertise are assigned one of three (A, B, C) categories as per reduction of the degree of environmental impact. The proposed activities are separated by sectors (energy, mining, chemical industry, pharmaceutical industry, metal production and processing, waste management, building materials industry, light industry, infrastructure, water, urban development, agriculture, etc.).

In the waste sector the following is assigned as a Category A: collection, storage, use, treatment, recycling, removal, disposal, burial of hazardous waste, as well as establishment of landfill serving 15,000 and more people or accepting 10 and more tons of waste on a daily basis and (or) recycling of solid waste. In addition, in the sector of urban construction, the Category C is assigned to projects on construction of structures with an area exceeding 1,500 m².

It should be also noted that environmental expertise is required for all the activities not listed in section 3 of this Article, which are carried out in specially protected natural and forested areas, within the boundaries of historical and cultural monuments, in green areas provided for public use.

According to the Law the urgent activities on ensuring the state security and mitigating consequences of emergency situations are not subject to environmental expertise.
The Law on EIA is generally consistent with the EIA approaches followed by international conventions and development assistance agencies (e.g., ADB, EIB, EBRD, WB, etc.). The law is applicable for the activities related to road construction, reconstruction and/or expansion, and a positive conclusion on an Environmental Impact Assessment must be obtained from the State Environmental Expertise SNCO of the Ministry of Nature Protection prior to commencement of civil works. The Law on EIA law also provides for public involvement and participation at all stages of the EIA.

Other RA decree on PCB contaminated waste management

Reference N41 from the RA Government Meeting Protocol on “Approval of PCB contaminated waste management guideline” dated 20.10.2011

The Legal requirements permits

The legal requirements permit held for the project and information about the status of approval for any additional licenses or permits required to perform rehabilitation activities presented in the Table 2.

Table 2. Legal requirements permits

<table>
<thead>
<tr>
<th>Name of permit, agreement, conclusion</th>
<th>Issuing authority</th>
<th>Obtaining stage</th>
<th>Status of approval</th>
</tr>
</thead>
<tbody>
<tr>
<td>State Traffic Police Permit</td>
<td>Traffic Police of RA</td>
<td>Permit obtained during the design stage. Traffic Management Plan to be approved prior to commencement of civil works in each section during implementation stage.</td>
<td>Will be presented in the stage of delivery of large-sized (bulky) equipment, such as new transformers. (if needed)</td>
</tr>
<tr>
<td>Construction permit</td>
<td>Head of the appropriate community</td>
<td>Prior to construction</td>
<td>Approved</td>
</tr>
<tr>
<td>Agreement for disposal of construction waste</td>
<td>Head of the Agarak community</td>
<td>During construction stage, before disposal of the waste off-site</td>
<td>Decree on permit “Liaoning-EFACEC Electrical Equipment” LLC to collect and transport the construction and bulky waste generated from the construction 12 of August 2016 N150-A</td>
</tr>
</tbody>
</table>
3.3 Armenia’s Participation in International Environmental Conventions and Protocols

In addition to the aforementioned legal acts, the Republic of Armenia has signed and ratified a number of environmental conventions and protocols, which are presented in the Table 3 below.

Table 3. List of environmental conventions and protocols signed and ratified by RA

<table>
<thead>
<tr>
<th>No</th>
<th>Convention or Protocol, Name and Place</th>
<th>In Force</th>
<th>Signed</th>
<th>Ratified</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Convention on Wetlands of International Significance especially as Waterfowl Habitat (Ramsar, 1971)</td>
<td>1975</td>
<td>1993</td>
<td>Ratified by USSR</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Cartagena Protocol on Biological Safety (Cartagena, 2000)</td>
<td></td>
<td>2000</td>
<td>2004</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Kyoto Protocol (Kyoto, 1997)</td>
<td></td>
<td></td>
<td>2002</td>
<td>Re-registered in UN 2003</td>
</tr>
<tr>
<td>15</td>
<td>Convention on Protection and Use of Transboundary</td>
<td>1996</td>
<td></td>
<td>1999</td>
<td></td>
</tr>
</tbody>
</table>
International Conventions and Protocols signed and ratified by the Republic of Armenia, which are most relevant to the proposed project are presented in the list below:

- Convention on Biological Diversity (Rio-De-Janeiro, 1992);
- UN Framework Convention on Climate Change (New-York, 1992) and Kyoto Protocol (Kyoto, 1997);
- UN Convention to Combat Desertification (Paris, 1994);

### 3.4 Administrative Framework

This section briefly presents the roles of entities that may have involvement in the Project, primarily but not exclusively from an environment perspective.

This section briefly presents the roles of entities that may have involvement in the Project, primarily but not exclusively from an environment perspective.

**RA Ministry of Nature Protection**

The Ministry of Nature Protection (MNP) is responsible for the protection, sustainable use, and regeneration of natural resources as well as the improvement of the environment in the Republic of Armenia. In those areas, the MNP authority includes overseeing national policy development, developing environmental standards and guidelines, and enforcement. The MNP implements those functions through the structural departments.

The MNP also undertakes several functions through the following bodies:

- **Water Resources Management Agency** with its six Basin Management Organizations is the key institution responsible for the water resources management including, but
not limited to, the development and implementation of the National Water Policy, National Water Program and basin Management Plans; regulation of water use by issuance of permits for use of surface and ground water resources; assessment and classification of water resources by their use; participation in development of water standards and control of application, etc.

- **State Environmental Inspectorate** with its 11 regional offices oversees the implementation of legislative and regulatory standards in natural resources protection, use and renewal;
- **“Environmental Impact Expertise Centre” SNCO** conducts environmental assessments of designs for construction, reconstruction, rehabilitation and maintenance of water infrastructures according to the requirements of the Armenian legislation and ratified International Agreements and issues experts’ conclusions;
- **“Environmental Effect Monitoring Centre” SNCO** monitors water and air quality of Armenia through its network of observation points;
- **Bio-resources Management Agency** participates in the environmental impact assessment of designs for construction, reconstruction, rehabilitation and maintenance of main infrastructures, as well as the:
  - **Information Analytical Center**
  - **Center for Waste Investigation SNCO, and**
  - **Center for Hydro-geological Monitoring SNCO, etc.**

**Ministry of Energy Infrastructures and Natural Resources**
The Ministry of Energy Infrastructures and Natural Resources is a republican body of executive authority, which elaborates and implements the policies of the Republic of Armenia Government in the energy sector. The ministry is also responsible for the protection, sustainable use, and regeneration of natural resources, and implements its functions through the following bodies:

- Agency of Mineral Resources;
- Subsoil Concession Agency.

**Ministry of Territorial Administration and Development**
Marzpetarans (regional administration bodies) are responsible for administration of public infrastructure of local significance falling under the regional jurisdiction. Bodies of local self-government (communities) are responsible for administration of public infrastructure of local significance (including waste disposal sites) registered as ownership of communities.

**Ministry of Emergency Situations**
The Ministry of Emergency Situations elaborates and implements the policies of the Republic of Armenia Government in the area of civil defense and protection of population in emergency situations. **Armenian State Hydro-meteorological and Monitoring Service SNCO**
is among the structural entities acting within the Ministry of Emergency Situations Ministry.

**Ministry of Healthcare**

Within the structure of the Ministry of Healthcare of RA the State Hygienic and Anti-epidemiological Survey is responsible for coordination of all issues related to health (including those on noise and vibration) and for supervision over implementation of sanitary norms, hygienic and anti-epidemiological measures implementation by organizations and citizens.

**Ministry of Culture**

The Ministry of Culture is a republican body of executive authority, which elaborates and implements the policies in the culture sector. The purpose of the ministry is to maintain and replenish the cultural heritage, promotion and development of contemporary art. The Ministry also includes the following separate divisions:

- Agency for Protection of Cultural Heritage;
- Historical and Cultural Heritage Protection Agency.

**Ministry of Labor and Social Affairs** among other things is responsible for development and implementation of the state policy, legislation and programs in the following areas: social security, labour and employment, social assistance, social assistance to disabled and aged people, social protection of families, women and children, etc.

**Ministry of Economic Development and Investments** is responsible for the elaboration and implementation of the economic and industrial development policies of the Republic of Armenia.

**State Urban Development Committee under Government of RA**

The State Urban Development Committee is a republican body of the executive authority that shall develop and implement the policy of the Government of the Republic of Armenia in the field of urban development. The Committee's functions include but are not limited to elaborating the main provisions of the state policy on urban development and the territorial development programs; drawing up documents for urban development programs on national and regional (micro-regional) levels; coordinating the drafting of chief layouts and zoning projects of communities, elaborate the strategy on the sustainable urban development of territories and residential areas; adjusting the engineering infrastructure programs with development programs (with respect to urban development documents); defining the restrictions and norms on urban development in respect of lands designed for construction; elaborating the programs for the development of communal infrastructures and creation of landfills (polygons), etc.
Public Services Regulatory Commission of RA is responsible for establishment of tariff policy in the Republic of Armenia.

The State Committee of the Real Estate Cadastre under Government of RA is a republican body of executive authority, which elaborates and implements the policies of the Republic of Armenia Government in the area of maintaining the unified national cadastre of immovable property.

4. DESCRIPTION OF EXISTING ENVIRONMENTAL CONDITIONS

4.1 Climate

Construction area is located in the Syunik marz, in sufficient warm, comparatively wet climatic. The climate of the construction area is hot, with soft winters and dry subtropical at the sites adjoining to the river Araks. There are no meteorological stations at the investigated site. The description of climatic elements is given according to the «Climatic Atlas of the Armenia».

Average annual air temperature is 14.3°C. The absolute minimum temperature is -18°C and the absolute maximum is 43°C.

Maximum depth of land frost is 31 cm. Mean annual air pressure is 820 mb.

Winds blowing towards southeast are prevalent during the year and their mean speed during the year fluctuates in the ranges of 2.4 m/sec. Annual average precipitation makes up 280 mm.

4.2 Relief

The construction site is located in the southern part of Syunik Marz, in low streams of the Karchevan River (tribute of Araks river). Geomorphologically the area has very irregular terrain with absolute elevations of around 725 m.

4.3 Soil and land use

According to soil zones the project area in included in forest and steppe soil zone which is specified by forest brown and valley-steppe types of soils. According to cadastral evaluation of the type of agricultural soils the investigated area is included in Syunik evaluation region.
Forest brown typical and carbonate subtypes of soils are characterized by weak differentiation of genetic horizons. According to mechanical texture, these soils have mainly light and moderate sandy-clayey, clayey and clayey-sandy composition with low percentage. According to the degree of stoniness, the lands under the project area are characterized mainly by low surface profile to average stoniness, in distinct small places one may encounter also average and strong stony areas.

According to strength, the agricultural lands of the project area are mainly characterized by little strength (about 66%), their strength is 0-39 cm, the rest of the lands have average strength, about 40-60 cm, strong lands, with the strength of more than 60 cm, are rare (about 7%). According to the degree of erosion most irrigated lands are slightly eroded, in the upper layer of arable lands in particular, and in some relatively slanting slopes there are average, sometimes strongly eroded areas.

The content of humus in the irrigated lands of the project area is little. The content of humus varies between 1.31-2.92, the soil pH concentration varies between 6.8-8.2, that is to say, the lands have slight saline and saline reactions.

Valley-terrace soils of the project area are spread in the left valley of the Araks River. These irrigated lands are mainly devoid of underground water feeding they have a weakly developed, mostly weak surface and deep average stony profile. These soils have mainly clayey-sandy mechanical composition, about 72% of the areas, about 23% have clayey composition and the remaining area is occupied by soils with sandy-clayey mechanical composition.

According to the strength of humus horizons, about 65% of these lands have average strength- 40-60 cm. The rest of the lands of the area have little strength-0-39 cm. These lands are considered to contain little humus with respect to humus content. The latter varies between 1.31-2.47%, the soil pH concentration varies between 7.8-8.1, the soils have slight saline reaction.

The areas of the main pressure pipeline and the areas under its right and left branches consist of gravely-pebble soil with up to 10% inclusion of river rocks and up to 25% sandy loam matrix.

The land owned by citizens and legal entities of the Agarak community respectively comprise 3.97 hectares and 56.67 hectares. The community land consists of 246.03 hectares of land and the state-owned lands are 19.60 hectares.

Table 3. The Agarak urban community lands by designation

<table>
<thead>
<tr>
<th>N</th>
<th>The Agarak urban community lands by designation</th>
<th>Hectares</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The total area of land involved in the administrative boundaries of the community, of which:</td>
<td>326.27</td>
</tr>
<tr>
<td>1.1.</td>
<td>Agricultural lands</td>
<td>33,73</td>
</tr>
<tr>
<td>1.2.</td>
<td>Residential areas</td>
<td>235,73</td>
</tr>
<tr>
<td>1.3.</td>
<td>Manufacturing, mining and other industrial land</td>
<td>33,31</td>
</tr>
<tr>
<td>1.4.</td>
<td>Energy, communications, transport and municipal utilities infrastructure lands</td>
<td>6,14</td>
</tr>
<tr>
<td>1.5.</td>
<td>Special protected areas</td>
<td>3,82</td>
</tr>
<tr>
<td>1.6.</td>
<td>Special Purpose</td>
<td>6,97</td>
</tr>
<tr>
<td>1.7.</td>
<td>Forest lands</td>
<td>0</td>
</tr>
<tr>
<td>1.8.</td>
<td>Water lands</td>
<td>6,57</td>
</tr>
<tr>
<td>1.9.</td>
<td>Reserve lands</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: Four-years development programme of the Agarak urban community for the years 2013-2016.

Map 2: Agarak municipality boundaries

4.4 Seismicity

According to the Republic of Armenia seismic zoning map, the investigated area in southern part of Syunik Marz (Agarak region) is in IX and more seismic zone, with 0.4g acceleration.
4.5 Hydrology

The hydrological network of the territory belongs to the transboundary Araks River basin. The Karchevan River originates from the eastern slopes of Zangezur mountain chain. The altitude at headwaters is 2350m and the river mouth elevation is 535 m. The river is 11km long; drainage basin surface is 28.2 km².

The surface water quality in the region is monitored by the EIMC SNCO of the RA MNP. There is sampling point surface water quality monitoring near the project area located in the Karchevan river.

Table 5. The results of water quality monitoring (chemical) on Karchevan river in 2015

<table>
<thead>
<tr>
<th>N</th>
<th>Place of monitoring checkpoint</th>
<th>Number of samples</th>
<th>MPCs (The maximum permissible concentration) exceeded indicators names</th>
<th>The number of cases exceeding MPC</th>
<th>The average annual concentrations exceeding the MPC from (time)</th>
</tr>
</thead>
<tbody>
<tr>
<td>29</td>
<td>2 km South of Agarak</td>
<td>11</td>
<td>sulfate ion</td>
<td>5</td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>nitrite ion</td>
<td>4</td>
<td>1.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>BOD 5</td>
<td>3</td>
<td>_</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>COD</td>
<td>5</td>
<td>_</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>aluminum</td>
<td>10</td>
<td>3.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>vanadium</td>
<td>11</td>
<td>11.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>chrome</td>
<td>11</td>
<td>4.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>manganese</td>
<td>1</td>
<td>_</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>copper</td>
<td>11</td>
<td>2.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>selenium</td>
<td>9</td>
<td>5.0</td>
</tr>
</tbody>
</table>

Source: "Environmental Effect Monitoring Centre" SNCO

Table 6. Karchevan (2 km South of Agarak - monitoring checkpoint 29) river water quality monitoring results
5-day biochemical oxygen demand, MPC = 3 \text{ mg} / \text{l}  
Chemical oxygen demand, MPC = 30 \text{ mg} / \text{l}  
Ammonium ion, MPC = 0.39 \text{ mg N} / \text{l}  
Nitrite ion, MPC = 0.024 \text{ mg N} / \text{l}  
Sulfate ion, MPC = 100 \text{ mg} / \text{l}  
Chromium, MPC = 0.001 \text{ mg} / \text{l}  
Selenium, MPC = 0.001 \text{ mg} / \text{l}  
Aluminum, MPC = 0.04 \text{ mg} / \text{l}  

<table>
<thead>
<tr>
<th>Month</th>
<th>5-day Biochem. BOD</th>
<th>Chemical BOD</th>
<th>Ammonium</th>
<th>Nitrite</th>
<th>Sulfate</th>
<th>Chromium</th>
<th>Manganese</th>
<th>Vanadium</th>
<th>Aluminum</th>
<th>Selenium</th>
</tr>
</thead>
<tbody>
<tr>
<td>August 2016</td>
<td>- 40 -</td>
<td>- 221.6</td>
<td>0.0026</td>
<td>0.0037</td>
<td>- 0.0160</td>
<td>0.19</td>
<td>0.0553</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>July 2016</td>
<td>- 56 - 0.032</td>
<td>184.7</td>
<td>0.0022</td>
<td>0.0046</td>
<td>0.0223</td>
<td>0.0134</td>
<td>0.14 -</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>June 2016</td>
<td>- 38 -</td>
<td>163.5</td>
<td>0.0018</td>
<td>0.0023</td>
<td>- 0.0085</td>
<td>-</td>
<td>0.0021</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>May 2016</td>
<td>- - 0.05</td>
<td>143</td>
<td>0.0026</td>
<td>0.0037</td>
<td>- 0.0104</td>
<td>0.07 0.0018</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>April 2016</td>
<td>- - 0.038</td>
<td>143</td>
<td>0.0028</td>
<td>0.0072</td>
<td>- 0.0121</td>
<td>0.228 -</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>March 2016</td>
<td>- 56 0.029</td>
<td>179</td>
<td>0.0012</td>
<td>0.0022</td>
<td>- 0.0079</td>
<td>0.064 0.0023</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>February 2016</td>
<td>4.13 - -</td>
<td>184.6</td>
<td>0.0022</td>
<td>0.0036</td>
<td>- 0.0134</td>
<td>0.051 0.0031</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>January 2016</td>
<td>- - -</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>December 2015</td>
<td>4.53 - -</td>
<td>185.166</td>
<td>0.0021</td>
<td>0.0030</td>
<td>- 0.0124</td>
<td>0.05704 0.0021</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>November 2015</td>
<td>- - 0.037</td>
<td>-</td>
<td>0.0037</td>
<td>0.0053</td>
<td>- 0.0166</td>
<td>0.42079 0.0035</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October 2015</td>
<td>- - -</td>
<td>-</td>
<td>0.0038</td>
<td>0.0038</td>
<td>- 0.0017</td>
<td>0.2768 0.0029</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>September 2015</td>
<td>- 36 - -</td>
<td>-</td>
<td>0.0022</td>
<td>0.0039</td>
<td>- 0.0137</td>
<td>-</td>
<td>0.1256</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: "Environmental Effect Monitoring Centre" SNCO

The oxygen, mineralization and nutritional regime are analyzed, as well as 42-68 hydrochemical, including heavy metals, primary and secondary organic pollutants.

Karchevan River with their Khachidzor and Agarak tributaries are polluted in the result of exploitation of metal mines, as well as with runoff from operational and already reclaimed tailings.

Due to a high level of anthropogenic pressure, the natural ecological state of the river is completely disrupted. No aquatic diversity (phytoplankton, zooplankton, zoobenthos and fish) is found in the river. The Karchevan River has a metallic shade, odor and taste due to
high level of mineralization and the concentration of heavy metals (manganese, copper, molybdenum, zinc, iron, lead, arsenic, etc.). River water is characterized with alkaline environment and has sodium-sulphate nature, which is conditioned by extremely high concentration of suspended particles. The river water is polluted with large amounts of hardly degradable, long-chain organic substances, which are staying long in the aquatic ecosystems. Bad quality of the Karchevan River is a result of the pressure posed by the effluents of the Agarak Combine.

As a result of pollution by heavy metals leaded to contamination of waters and ecosystems degradation. As a result, biodiversity in the lower reaches of the Karchevan Rivers has disappeared.

4.6 Biodiversity

The biodiversity and ecosystems of Armenia are very rich due to the geographical position, complicated geological structure, altitude and the fact that flora and fauna are in different boundaries of natural climatic zones. Intensive human activity has adversely impacted the rich biodiversity of Armenia's ecosystems and their components. Being one of the biggest economic activities, agriculture is also considered to be the activity that most upsets the balance of nature components, endangering the biodiversity of Armenia.

Flora

According to natural conditions differences the flora of the Syunik region is various, that is a consequence of natural-historical development, original geographical location and mountain character of territory. The basic feature of vegetation's distribution is belts on ascending. The upper and bottom borders of some belts are different, i.e. sometimes the vegetation of one belt type nestles close into another that is caused by water, soil and microclimatic features.

On the territory of project area in foothills at height up to 700-1000m on abrupt stony slopes and round them the xerophilous (friganoide) vegetation of semidesert type it is observed. They are often called the vegetation of skeletal mountains on which the influence of Iranian deserts is appreciable. The most typical kind of semi-desert vegetation is Fragrant wormseed (Artemisia fragrance). In the Spring these territories become covered by Ceratocephala falcata, Anisantha tectorum. The communities of mountain xerophilous plants are extended on slopes, for which the clumbing types of plants, the undersized trees, the mixed light forest and bushes (Dactylis L, locoweed (Astragalus L.), esparcet (Onobrychlis), buckthorn (Rhamnus L.), almond tree (Rosacae, etc.) are typical.

The Upper Alpine vegetation is characteristic to meadow association: Campanula tridentate Schreb., Carrx tristis Bieb., Taraxacum stevenii DC., Plantago saxatilis Bieb., Colpodium araraticum Tarutv., Poa alpina L., Nardus glabriculmis Sakalo, Sibbaldia parviflora Wild.
The platyphyllous types of plants, in particular, beech (Fagus orientalis Lipsky), oak (Quercus iberica Stev., Q. macranthera Fisch. Et Mey. Ex Hohen), hornbeam (Carpinus betulus L., C. Orientalis Mill), ash tree (Fraxinus excelsior L.), lime tree (Tilia begoniifolia Stev) are characteristic to forest community.

A number of vegetative kinds is under the threat of disappearance and are brought in the Red Book of Armenia as follows:

- Peltariopsis grossheimii N. Busch Category: CR B1 ab(iii) + 2 ab (iii)
- Samerararia glastifolia (Fisch. & C.A.Mey.) Boiss. Category: CR B1 ab(iii) + 2 ab(iii)
- Peucedanum pauciradiatum Tamamsch. (=Zeravschania pauciradiata (Tamasch.)M. Pimen.). Category: CR B1 ab(ii,iii,iv) + 2 ab(ii,iii,iv)
- Allium scabriscapum Boiss. & Kotschy. Category: CR B1 ab(iii) + 2 ab(iii)
- Allium akaka S. G. Gmel. ex Shult. & Shult. f. Category: CR B1 ab(iii) + 2 ab(iii)
- Asterolimon linum-stellatum (L.) Duby. Category: CR B1 ab(ii,iii) + 2 ab(ii,iii)
- Reseda globulosa Fisch. & C.A.Mey. Category: CR B1 ab(ii,iii,iv) + 2 ab(ii,iii,iv)
- Verbascum erivanicum E. Wulf. Category: CR B1 ab(iii) + 2 ab(iii)
- Acantholimon federovii Tamamsch. & Mirzoeva. Category: CR B1 ab(iii) + 2 ab(iii)
- Colutea komarovii Takht. Category: CR B1 ab(ii,iii,iv) + 2 ab(ii,iii,iv); C 2a; D
- Anthochlamys polygaloides (Fisch. et C. A. Mey.) Fenzl. Category: CR B1 ab(iii) + 2 ab(iii)
- Citrullus colocynthis (L.) Schrad. Category: CR B1 ab(iii) + 2 ab(iii)
- Boletus satanas Lenz. Category: (EN – Endangered):
- Verbascum megricum (Tzvelev) Hub.-Mor. Category: EN B1 ab(iii) + 2 ab(iii)
- Aira elegantissima Schur. Category: EN* B1 ab(iii) + 2 ab(iii)
- Sclerochloa woronowii (Hack.) Tzvelev ex Bor. Category: EN B1 ab(iii) + 2 ab(iii)
- Lycium anatolicum A.Baytop. & C.Mill. Category: EN B1 ab(ii,iii,iv) + 2 ab(ii,iii,iv)
- Amberboa iljiniana Grossh. Category: EN B1 ab (i,ii,iii) + 2 ab (i,ii,iii)
- Amberboa turanica Iljin. Category: EN B1 ab(ii,iii,iv) + 2 ab(ii,iii,iv)
- Echinops polygamus Bunge (= E. grossheimii Iljin; E. leucographus auct. non Bunge) Category: EN B1 ab(ii,iii,iv) + 2 ab(ii,iii,iv)
- Jurinea elegans (Stev.) DC. Category: EN B1 ab(iii) + 2 ab(iii)
- Amygdalus nairica Fed. et Takht. Category: EN B1 ab(ii,iii) + 2 ab(ii,iii)
- Erysimum lilacinum E. Steinb. Category: EN B1 ab(ii) + 2 ab(ii)
- Andrachne rotundifolia C.A.Mey. Category: EN B1 ab(ii,iii,iv) + 2 ab(ii,iii,iv)
- Gladiolus szovitsii Grossh. Category: EN B1 ab(iii) + 2 ab(iii)
- Tulipa florenskyi Woronow. Category: EN B1 ab(ii,iii,iv) + 2 ab(ii,iii,iv)
- Centaurea alexandrii Bordz. Category: EN B1 ab(ii,iii) + 2 ab(ii,iii)
- Cousinia erevanensis Bornm. Category: EN B1 ab(ii,iii,iv) + 2 ab(ii,iii,iv)
- Cousinia megrica Takht. Category: EN B1 ab(ii,iii,iv) + 2 ab(ii,iii,iv)
• Zuvanda meyeri (Boiss.) Askerova (= Malcolmia meyeri Boiss.). *Category: EN B1 ab(iii) + 2 ab(iii)*
• Sedum tetramerum Trautv. *Category: VU*B1 ab(iii) + 2 ab(iii)*
• Psilurus incurvus (Gouan) Schinz et Thell. *Category: VU*B1 ab(iii) + 2 ab(iii)*
• Jaubertia szovitsii (DC.) Takht. (=Neogaillonia szovitsii (DC.) Lincz). *Category: VU*B1 ab(iii) + 2 ab(iii)*
• Cheilanthes pteridioides (Reichard) C. Chr. *Category: VU*B1 ab(iii) + 2 ab(iii)*
• Enneapogon persicus Boiss. *Category: VU*B1 ab(iii) + 2 ab(iii)*
• Erianthus ravennae (L.) P. Beauv. *Category: VU*B1 ab(iii) + 2 ab(iii)*

**Fauna**

The specific compound of fauna was influenced by the fauna of Iran, Anatoly, Small Caucasus, partially Middle Asia regions. Therefore the fauna of region is so various, here there are such kinds of animals which are characteristic only for Armenian highland: Armenian moufflon, bezoarian goat, the snow leopard.

Invertebrates on this territory are represented basically by the kinds having ancient origin: Mediterranean, Iran-Turanian, Crimea-Caucasian and Caucasian: They are rich with endemics, most representative of them are Phytodrymadusua armeniaca (cricket), Nocarodes armenus (grasshopper), Dictyla subdola, Geotomus punctulatus (wood louse), Amphicoma eichleri, Cantharis araxico (bugs) Tomomyza araxana, Bombilius schelkovnikovii (dipterans), Shadinia akramowskii, Gabbiella araxena, Pupilla bipapulata (molluscs), Zodarion petrobium (the spiders).

From mammals it is possible to note Microtus arvalis (field mouse), Martes martes (marten), Vulpes vulpes (fox), Erinaceus auritus (big-eared hedgehog), Nyctalus noctula (Noctule bat), Vespertilio ognevi, Brown long-eared bat (Plecotus auritus).

The herpetofauna is represented by 26 kinds, 11 of which are lizards, 13 kinds of snakes and 2 kinds of turtles. Darevsky raddei, Ophisops elegans, Eumeces schneideri, Mabuya aurata, Lacerta strigata (lizards), Elaphe hohenackeri, Telescopus fallax, Eryx jaculus, Vipera lebetina, Vipera raddei, Malpolon monspessulanus, Eirenis collaris, Tylops vermicularis, Eirenis punctatolineata, Elaphe quatuorlineata, Pseudocyclophis persicus(snakes), Greece tortoise (Testudo graeca).

On rather limited territories Pheasant (Phasianus colchicus), Black francolin (Francolinus francolinus), Desert wheatear (Oenanthe xanthoprymna), etc. meet, more than 50 kinds feathery.

The animals brought in the Red Data Book of Armenia:

**Bivalvia**

• Odnneripisidium annandalei (Prashad, 1925). *Category: CR B2a*
• Gyraulus regularis (Hartmann, 1841) *Category: CR B1a-B2a*
Insecta
• Orthetrum sabina (Drury, 1770). Category: EN B2a
• Crocothemis servilia (Drury, 1773). Category: CR B1a+B2a:
• Phytodrymadusa armeniaca Ramme, 1939 Category: EN B1a+B2a
• Tanyproctus araxidis Reitter, 1901 Category: EN B1a+B2a
• Aeoloides figuratus (Germar, 1844) Category: VU B1a
• Drasterius atricapillus (Germar, 1824) Category: EN B2a
• Craspedostethus permodicus (Faldermann, 1835) Category: VU B1a+B2a
• Acmaeoderella pellitula (Reitter, 1890) Category: EN B1a+B2a
• Anthaxia superba Abeille de Perrin, 1900 Category: CR B1a
• Sphaerobothris aghababiani Volkovitsh & Kalashian, 1998 Category: CR B1a+B2a
• Entomogonus amandanus Reitter, 1901 Category: EN B1a
• Asias aghababiani Danilevsky, 1999 Category: CR B1a+B2a
• Papilio alexanor orientalis Romanoff, 1884 Category: VU B1a+B2a
• Thersamonolycaena dispar rutila (Werneburg, 1864) Category: CR B1a+B2a
• Agrodiaetus damonides (Staudinger, 1899) Category: CR B1a+B2a
• Hyles hippophaes caucasica (Denso, 1913) Category: VU B1a+B2a
• Proserpinus proserpina (Pallas, 1772) Category: VU B1a+B2a
• Axiopoena karelini Ménétriés, 1842 Category: VU B1a+B2a
• Anthophora robusta Klug, 1845 Category: VU B1a+B2a
• Bombus niveatus Kriechbaumer, 1870 Category: VU B1a+B2a
• Crematogaster subdentata (Mayr, 1877) Category: EN B2a
• Tetramorium levigatus Karawajew, 1926 Category: CR B2a
• Machimus erevanensis V. Richter, 1963 Category: EN B1a+B2ab(iii)
Reptilia
• Trachylepis septemtaeniata Reuss, 1834 Category: Category: EN B1ab(iii)+B2ab(iii)
• Eumeces schneideri (Daudin, 1802) Category: Category: EN B1ab(iii)+B2ab(iii)
• Eremias pleskei Bedriaga, 1907 Category: CR B2ab (ii, iii)
• Zamenis hohenackeri (Strauch, 1873) Category: VU B1ab (iii)
There are no specially protected floras and faunas or endemic species in the construction site area.

5. IMPACT ASSESSMENT

5.1 Introduction

This section addresses major potential environmental and social impacts associated with the planning of the rehabilitation of Agarak-2 substation, and presents proposed mitigation measures.

The CEMP requires identification and assessment of all potential significant environmental effects arising from the proposed project. The methodology used in identifying the likely significant environmental effects of the proposed project included desk review of the existing available materials (design documents and available literature to collect the environmental baseline data), as well as field works conducted on proposed site (site-specific surveys conducted during design development). Also there are used the same methodology provided by FICHTNER in the IEE report.
The project is not expected to have significant or irreversible negative environmental and social impacts neither at the construction, nor at operation phases. Impacts of the construction phase will be typical for all medium scale construction activities, short-term and limited to the project site. Impacts of the operation phase are expected to be typical for operating electrical substations. There are no specially protected areas or threatened or endangered endemic species in the construction site area. All of the rehabilitation measures will take place within buildings and fenced areas of the substation. There is no need for any land acquisition outside the existing substation area. At a substation surveyed enough space for the additional equipment is available. The replacement of the ground wires will be done on existing power lines. Existing maintenance routes will be used as access to the towers. The replacement of the ground wires will be done on existing power lines. Existing maintenance routes will be used as access to the towers.

The potential cumulative effect is that the project result will be more reliable power supply within Armenia. An increased stability of the electricity supply, especially if a raising demand is expected, is a locally and regionally positive impact of the project.

The nearest Agarak community is located 0.3 km far from project area. As well as there are no sensitive receptors on the distance of 250 meters from the Agarak-2 substation area. The location of Agarak-2 substation and Agarak community is presented in the picture Layout 2.

*Layout 2. Location of the project construction area of Agarak-2 substation*
The likely adverse environmental impacts during construction phase may include the following: landscape impacts due to excavation and construction works, pollution of surface and ground water, air pollution, noise, impacts on biodiversity. In addition the hazard vulnerability, impacts on land use, resettlement, impacts on historical and cultural resources, socio-economic impacts, occupational health & safety issues, etc. Most of the impacts expected during construction phase of the substation will be of short-term nature and limited to the project site boundaries. Main impacts will result in the generation of waste from replacement measures at the substations as there are oil, batteries, scrap metals, cement asbestos roofs and ceramics. Especially asbestos, oil and batteries, containing sulfuric acid and lead, could be harmful to the environment.

All the adverse environmental and social impacts expected during construction phase can be prevented, minimized and mitigated through the appropriate measures envisaged in the CEMP. In the meantime it shall be noted that the short-term positive socio-economic impacts during the rehabilitation of the Agarak-2 substation are expected to be significant, since the Project create new employment opportunities and lead to overall improvement of the socio-economic situation and population welfare.

The long-term positive impact of the operation of a new rehabilitated Agarak-2 are obvious and consist in a much more reliable power supply in Armenia.

The most important potential environmental and social impacts as well as relevant mitigation measures are presented below in the section.

### 5.2 Construction Impacts

Possible negative impacts are related to the construction works and hence are expected to be localized and short-term. As a result of timely and proper implementation of this CEMP with appropriate mitigation measures all these potential negative impacts can be prevented and minimized. Above mentioned environmental impacts mostly would be limited to:

**Soil pollution, erosion and landscape degradation**
Total volume of soil and rock that would be excavated and supplied for backfilling and relocating during Agarak-2 substation reconstruction is not significant, but it may lead to erosion problems and impacts on soils. The special attention should be paid during design of vertical planning solutions and development of work performance program for all types of earthworks, handling of fuel, oil to power and maintain the different equipment on site. The impacts on vegetative cover will be localized, and associated with rehabilitation works. When ditches and slopes and other infrastructure are restored anti-erosive measures should be implemented during the re-cultivation period. Special attention should be paid on

- disposal of excavated materials and construction wastes,
- Demolition debris will be generated during the construction works; contaminated soil
- Handling and disposal of hazardous wastes and materials. (Old batteries, asbestos roofs, used oil and old scrap metals like iron/steel/copper are main wastes being potentially hazardous during the rehabilitation of the substation.)
- Inadequate siting and disposal of garbage, surplus materials and construction debris

**Impacts on water resources, surface water and groundwater**
Potential impacts on water resources may take place during the construction phase at the areas of Agarak-2 substation located nearby the river Karchevan (around 200 meter). As a result of oil leakage from machinery and stock piled construction materials, oil products and chemicals can penetrate to the ground water or run off to water recipients. Special measures shall be implemented in order to protect the existing water resources from all possible pollutions.

**Pollution of water due to rainwater runoff of contaminated surfaces**
As a result of oil leakage from machinery and stock piled construction materials and asphalt, oil products and chemicals can penetrate to the soil and/or ground water or run off to water recipients.

During replacement of old equipment and the cleaning activities the oil could pollute the soil and intrude into the groundwater due to runoff, as well as rainwater runoff of contaminated surfaces.

Special attention should be paid to the run-off from exposed soil, such as runoff from the top soil stock pile, sand, excavated materials etc. during rain and storm flows.

**Generation of excavated materials and construction wastes**
Demolition debris will be generated during the rehabilitation/construction works on road and associated infrastructure. These effects will be localized, and will be minimized by means of appropriate removal and disposal procedures.

**Disposal of excavated materials and construction wastes**
Demolition debris will be generated during the rehabilitation/construction works on roads. These effects will be localized, and will be minimized by means of appropriate removal and disposal procedures, which may include but not be limited to careful selection of waste temporary accumulation sites, clear delineation of these sites to exclude their expansion, prevention of washout of such sites, obtaining written agreement on permanent disposal site with local authorities and timely transportation of waste to the designated dump site.

**Noise, vibration, and emissions**
Noise, vibration, and emissions will be generated in the course of the operation of construction equipment, transportation of construction materials and truck traffic. Emission of inorganic dust from digging-loading works, emission of harmful substances and dust from
combustion of diesel used by transportation means and machinery, as well as bitumen smoke arising from the construction works. Welding works cause welding aerosol and manganese monoxide emissions. Concrete mixers work result in concrete dust emissions.

Dust arising from construction works will have negative impact on the ambient air quality, and it is necessary to take effective protective measures to minimize the negative impact.

During implementation of construction works the extensive vibration may have adverse impact on the building and structures located nearby Agarak-2 substation, as well as cause nuisance to their inhabitants and users, and it is necessary to take effective protective measures to minimize the negative impact.

However, no major pollution is expected as long as proper construction/equipment functioning practices are applied.

Safety hazards from construction activities
Safety hazards can occur due to violation of proper health and safety practices and may lead to injuries and accidents. No major hazards are expected during construction of the proposed project elements as long as proper construction practices and safety procedures are applied.

Traffic disruption during construction activities
These impacts will occur during the construction works, but will be related to the transport of different raw/construction materials to the work site.

Community health and safety
The project may change the community's exposure to risks and impacts arising from accidents and structural failures. Impacts on the health and safety of the community may also arise during construction as a result of noise, dust and other emissions from earthmoving, piling, and operation of equipment and vehicles. The negative social impacts of the project arisen during construction however can be mitigated through correct organization of the construction process and proposed mitigation measures.

Impacts on population
Impacts on population are expected to be in general positive. Rehabilitation of Agarak-2 substation will have certain positive impacts on labor force in the affected area. It will make it possible for young people to stay in the project area and commute to work.

Safety hazards from construction activities and during operation
No major hazards are expected during the construction of the proposed project elements, as long as proper construction practices and safety procedures are applied.

Short-term positive impacts during construction phase will be created via local employment and spin-off effects and the associated increase in short-term expenditure. Construction will create a number of local jobs to prepare and reconstruct earthworks and to transport and apply construction materials. In-turn, households and small businesses will benefit significantly over the short-term.
6. MITIGATION MEASURES

- Obtain permits from the relevant local/regional authorities for disposal of excavated materials and construction waste;
  - The permit was given by the Head of Agarak community of Syunik region of Republic of Armenia to the "Liaoning-EFACEC Electrical Equipment" LLC to collect and transport the construction and bulky waste generated from the construction from Agarak-2 substation to the Communal infrastructure area located on 90 Sayat-Nova St. (Decree N150-A of the Head of Agarak community of Syunik region of Republic of Armenia dated 12 of August 2016 is attached in the Annex 1).

- Soil Stabilisation and site restoration
  - Careful planning to minimize soil exposure;
  - Limit disturbance when excavating and preserve as much native vegetation as possible to reduce erosion and act as natural sediment filter.
  - Re-seed or re-plant disturbed areas after completion of civil works before building commences to stabilise exposed soil.
  - Restoration to quasi-original conditions of landscape after completion of reconstruction works;
  - Enhance protective cover with naturally growing species of grass/shrubs and ornamentals;
  - Contractor facilities will be restored to the satisfaction of local officials after use and before abandonment;

- Stockpile Protection
  - Minimise the number and size of stockpiles - maximum 2:1 height to width ratio.
  - Stockpiles must be placed at least 10m from water courses and paved areas.
  - Cover stockpiles with geotextiles, stabilisation matting or other suitable material when necessary.
  - Stockpile area must be kept secure to prevent illegal dumping.

- Vehicle and Road Management
  - Vehicles and equipment will be fitted with emission controls and silencers to meet national noise control and emission standards;
Use closed/covered trucks for transportation of raw/construction materials and debris;

Vehicles and equipment will be maintained in designated areas underlain by an impervious pad of concrete or clay (for later removal and safe disposal)

The vehicles and equipment shall be maintained to prevent fuel and oil leaks and to minimize air and noise pollution; Vehicle and equipment movements will be restricted to the approved construction zone;

Temporary traffic direction signs, markings, traffic signals and lightning will be installed and maintained and flagmen will be employed as needed;

The movement of trucks to disposal sits will be studied in order to avoid urban areas, schools and hospitals;

Local roads which are being used by the Contractor’s vehicles will be maintained by the Contractor so that communities continue to enjoy access along these roads. All roads will be repaired (if needed) and any damage made good after the works are finished.

- Dust Control
  o Electrostatic precipitators will be installed to reduce dust or exhaust gases and released via a set of water baths;
  o Clean the surrounding area from dust by water sprinkling, removal of excess materials and cleaning of sites upon completion of activities;

- Waste Control
  o Waste Storage , Disposal and destination
    a. The construction, solid, liquid waste will be managed as the Waste Management Plan indicates.
    b. A zone will be provided, for the preliminary accumulation of waste, including the scrap metal, that will cause no damage to the vegetation cover and other components of the environment
    c. Transport, handling and disposal of construction concrete rubbles, debris and spoils in approved paths and landfills/dump sites;
    d. Work areas will be kept clean and clear of waste and unused material, waste will be disposed properly;
    e. The temporary storage area for the scrap metal should be organised properly to avoid the pollution of surface and ground water as well as the soil layer
and other components of the environment. The location for the temporary storage of the metal scrap is showed in the layout of Agarak-2 substation.

f. Construction material/ all types of waste, including the scrap metal will be kept away from water bodies;

g. Diesel will be stored in drums or tanks under cover on an impervious pad of concrete or clay (for safe disposal), and the pad will be surrounded by an impervious bund enclosing a catch volume least 50% more than the volume of diesel stored. Should clay be used to form the bund and a spill occur, the bund will be removed after construction has ceased and disposed of safely (as for impervious pads of clay);

h. All generated scrap metals (around 12 tons) will be removed from in accordance with the RA Government Decision N1221 dated October 22, 2015 regarding reducing the statutory capital of “High voltage electric networks” CJSC and handing over the property (attached in Annex 2).

i. Waste oil (if any) will be collected and stored in used fuel drums for later safe disposal in approved sites;

j. Oil spillage will be managed in accordance to RA legislations.

k. In some cases appropriate guidance could be given to the workers in charge for handling old autotransformers, batteries, used oil, old scrap metals, chemicals, etc;

l. The handling and disposal of cement asbestos roof (around 80 square meter) and cement asbestos pipeline (around 2 meter) should be implemented in accordance with Armenian legislation and ADB requirements (Guidelines for Handling Non-friable Asbestos-containing Waste presented in the end of the Chapter A: "Waste management plan” of Annex 4).

- **Drainage Management**
  - Construction of adequate temporary and permanent drainage;
  - Runoff from sites will be prevented from entering natural water-courses, for example by using sediment traps, silt aprons and/or straw bales;

- **Significant Flora and Fauna Protection Standards**
  - Restrict construction works and workers’ activities along the construction site alignment by fencing to control encroachment, degradation and disturbance of Red Book species;
- **Safety measures**
  
  - Workers will use safety equipment PPE (helmets, eye-glasses, ear-plugs - as required) and follow safety procedures.
  
  - Site safety equipment such as scaffolds, ladders, life lines, balustrades, fences, plastic or concrete barriers, etc. will be provided to ensure safety of the work site;
  
  - Provide to each construction site with appropriate First Aid Kits and fire fighting equipment;
  
  - Nearby residents, commercial and industrial land users and communities will be informed of major activities ahead of their implementation and be informed of a clear mechanism for comments and complaints to be communicated to the Consultant;

No mitigation measures are required for PCB contained oil, because according to the information provided in IEE report (Ch.5.1) “at Agarak SS all the equipment is of the year 2001 thus it can reasonably concluded that the oil does not contain any PCB. It has also to be mentioned that no oil containing equipment at this switchyard will be replaced within this rehabilitation project.”

In addition to the presenting mitigation measures the following operating plans are prepared and attached in the Annex 4.

A. Waste Management Plan
B. Site Management Plans For Dump Sites
C. Emergency Response Plan
D. Community Communication Plan
### 6.1 Mitigation Measures for the Construction Phase

<table>
<thead>
<tr>
<th>Issue / Potential Impact</th>
<th>Action</th>
<th>Action Party</th>
<th>Costs</th>
<th>Date for Implementation</th>
</tr>
</thead>
</table>
| Grievance mechanism, Public Consultation and Communications | 1. Develop an application form for public complaints and suggestions.  
2. Install posters or project informational boards with relevant information for the Public: field office location, operating hours, names of responsible contact persons, "hot line" phone numbers, postal address and email addresses, etc.  
3. Keep a grievance register book available at the field office or in any other easily accessible location for affected people.  
4. Maintain a register of complaints (name, description of the problem, incoming date, response date, further follow-up action and resolution status).  
5. Allocate personnel responsible for dealing with issues raised by the Public.  
6. Organize meetings with affected community members to discuss CEMP, and meetings/consultations as needed as issues arise. 7. | CONTRACTOR  
The HSE specialist hired by the Contractor implements awareness and grievance redress program of the Plan  
CONSULTANT/IA  
Monitor the implementation | Included in construction costs | During construction |
| Soil / Erosion | **Design stage related mitigation measures**  
1. Use earth material management practice to reduce erosion and promote site restoration.  
a. All rehabilitation measures will be undertaken inside the existing facilities | CONTRACTOR  
Preparation of design documents  
CONSULTANT/IA  
Review design documents | Included in design cost | During design stage |
<table>
<thead>
<tr>
<th>Issue / Potential Impact</th>
<th>Action</th>
<th>Action Party</th>
<th>Costs</th>
<th>Date for Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Construction stage related mitigation measures</strong>&lt;br&gt;2. Implement the erosion control in accordance with Technical Specification and IEE Requirements.&lt;br&gt;3. Segregate and store in stable piles all topsoil and subsoil salvaged from construction areas.&lt;br&gt;4. Perform topsoil stripping from all construction sites and stockpiling in accordance with Armenian legislation as follows:&lt;br&gt;a. Stake land plots for before excavation starts to prevent disturbance of land and top soil outside the excavation area.&lt;br&gt;b. Clear the surface of the stripped area and grub from roots, shrubs, big stones and rocks to prevent their mixture with topsoil material before stripping.&lt;br&gt;c. Cover topsoil stockpiles with tarpaulin when needed to prevent wind erosion.&lt;br&gt;d. Bring back the topsoil to its original place after completion of construction or provide it to regional state bodies (Syunik Regional Administration) for further using.&lt;br&gt;e. where possible, keep native existing plants, as agreed with the managers of the ss.</td>
<td>CONTRACTOR&lt;br&gt;Implement provided actions. Coordinate disposal of soil and excess topsoil with heads of local communities&lt;br&gt;Hire local water trucks for dust control&lt;br&gt;Report results.</td>
<td>Included in construction costs</td>
<td>During construction</td>
<td></td>
</tr>
<tr>
<td><strong>Design stage related mitigation measures</strong>&lt;br&gt;1. Materials managed as required -no releases/spills. No discharge of untreated water&lt;br&gt;a. Drainage and sewage system. Storm water drainage system and Sanitary sewage drainage as indicated in document B2 – Civil Works Ch. 2.8.9.</td>
<td>CONTRACTOR&lt;br&gt;Preparation of design documents</td>
<td>Included in design cost</td>
<td>During design stage</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CONSULTANT/IA&lt;br&gt;Review design documents</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Issue / Potential Impact</td>
<td>Action</td>
<td>Action Party</td>
<td>Costs</td>
<td>Date for Implementation</td>
</tr>
<tr>
<td>--------------------------</td>
<td>--------</td>
<td>--------------</td>
<td>-------</td>
<td>-------------------------</td>
</tr>
<tr>
<td></td>
<td>b. Outdoor Foundations and Structures: Transformer foundations, Oil separator, and other Outdoor foundations as indicated in document B2 – Civil Works Ch. 6.10.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. Outdoor foundations as indicated in document B2 – Civil Works Ch. 2.8.5.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>d. Temporary Site Installation: Temporary roads, Temporary storage areas for the old, dismantled equipment and all kind of necessary temporary buildings for the execution phase of the project (storage, offices, workshops, security posts, etc). as indicated in Ch. 2.5 Document B2 – Civil Works.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Issue / Potential Impact</td>
<td>Action</td>
<td>Action Party</td>
<td>Costs</td>
<td>Date for Implementation</td>
</tr>
<tr>
<td>---------------------------</td>
<td>--------</td>
<td>--------------</td>
<td>-------</td>
<td>-------------------------</td>
</tr>
<tr>
<td>Construction stage related mitigation measures</td>
<td></td>
<td>CONTRACTOR</td>
<td>Included in construction costs</td>
<td>During construction stage</td>
</tr>
<tr>
<td>1. Regular maintenance of all vehicles and machines used on site. Maintenance activities of the vehicles to be performed only at commercial service stations or shops.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. No on-site re-fuelling except immobile equipment, with fuelling to be performed only by trained personnel. Only small quantities of fuel to be stored at construction compounds, and in containment.</td>
<td></td>
<td>CONSULTANT/IA</td>
<td>Monitor implementation</td>
<td></td>
</tr>
<tr>
<td>3. No refuelling within 50 meters of surface water. Spill cleanup kits to be kept with all equipment to be refuelled and in storage areas.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Appropriate storage of construction materials, fuel and hazardous materials on site.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Any spillage of construction liquid materials/wastes, oils to clean up quickly. Absorbent materials shall be available in stock on sites.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Carry out hazardous operations and use chemicals only on prepared impermeable surfaces.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Carry out the replacement of old equipment that contains dielectric oil with all precautions in order to avoid any leakage.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Locate works, facilities and equipment generating pollution and dust as far as possible from Karchevan rivers. Minimize work near surface water.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Regularly inspect, repair or maintain drainage structures/features to avoid sedimentation, especially after rainfall events,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Training course in cleanup for equipment operators.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Issue / Potential Impact</td>
<td>Action</td>
<td>Action Party</td>
<td>Costs</td>
<td>Date for Implementation</td>
</tr>
<tr>
<td>--------------------------</td>
<td>--------</td>
<td>--------------</td>
<td>-------</td>
<td>-------------------------</td>
</tr>
<tr>
<td>Solid waste</td>
<td>1. At the beginning of every month, record in the waste register the type and the quantity of waste generated by the construction activities. 2. Organize a training program on waste management for the Contractor’s Personnel, Mitigation for non-earthen wastes. • Collect solid wastes, including plastic, wood, cloth, metal, ceramic, paper, etc., and ensure proper management. • Adequate containers for waste collection shall be placed in the staff facilities and workers camps. • Mineral construction and demolition waste will be separated from general refuse, organic, liquid and chemical waste by on-site sorting and will be stored in an appropriate way. • No wastes are to be buried or burned. • Maximize waste minimization, reuse, recycling. • Before each construction site is abandoned, clean up all waste materials prior to site reclamation/reinstatement. • Offsite management/disposal in approved areas. Mitigation for earthen wastes (rock, subsoil, and other spoil): • Store in piles kept apart from topsoil stockpiles • Wherever possible, spread spoils on construction site prior to grading, covering with topsoil, and reclamation/reinstatement. • Leave any excess spoil in stable piles that are resistant to</td>
<td>CONTRACTOR Implement provided actions. CONSULTANT/IA Monitor implementation</td>
<td>Included in construction costs</td>
<td>Prior start of construction and during construction phase</td>
</tr>
<tr>
<td>Issue / Potential Impact</td>
<td>Action</td>
<td>Action Party</td>
<td>Costs</td>
<td>Date for Implementation</td>
</tr>
<tr>
<td>--------------------------</td>
<td>------------------------------------------------------------------------</td>
<td>----------------------------------</td>
<td>--------------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td></td>
<td>erosion. Cover piles with topsoil and seed/plant with native species, with monitoring monitored until vegetation cover is self-sustaining.</td>
<td>CONTRACTOR Implement provided actions.</td>
<td>Included in construction costs</td>
<td>Prior start of construction and during construction phase</td>
</tr>
<tr>
<td>Construction and demolition waste</td>
<td>Mineral construction and demolition waste will be separated from general refuse, organic, liquid and chemical waste by on-site sorting and will be stored in an appropriate way.</td>
<td>CONTRACTOR Implement provided actions.</td>
<td>Included in construction costs</td>
<td>Prior start of construction and during construction phase</td>
</tr>
<tr>
<td>Generation of chemically inert material</td>
<td>Chemically inert material can be used as landfilling material after its classification and identification according to National Regulation</td>
<td>CONTRACTOR Implement provided actions.</td>
<td>Included in construction costs</td>
<td>Prior start of construction and during construction phase</td>
</tr>
</tbody>
</table>
| Handling and disposal of Hazardous Materials and Wastes | **Design stage related mitigation measures**  
a. Temporary Site Installation: Temporary storage areas for the old, dismantled equipment as indicated in document B2 - Civil Works - 2.5.  
b. Waste identification and classification according to its composition, source, and type and according to National regulatory requirements.  
2. Removing of scrap metals and storage in proper area at | CONTRACTOR Preparation of design documents  
CONSULTANT/IA Review design documents | Included in design cost | During design stage |
<table>
<thead>
<tr>
<th>Issue / Potential Impact</th>
<th>Action</th>
<th>Action Party</th>
<th>Costs</th>
<th>Date for Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>substation site</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. Define the quantity of scrap metals that shall be removed from the substation and collected by third parties and their final destination.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. Define a storage area in the substation for the storage of scrap metals.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Generation of domestic waste</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. All solid waste shall be identified according to its composition, source, and type and according to National regulatory requirements as defined in Chapter 10.3.2 document B0.1 Project Description and General Project Requirements.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction stage related mitigation measures</td>
<td>1. Ensure proper labelling and availability of information regarding hazardous materials and waste at work site; obtain information from suppliers;</td>
<td>CONTRACTOR</td>
<td>Included in construction costs</td>
<td>Prior start of construction and during construction phase</td>
</tr>
<tr>
<td></td>
<td>2. Before use, identify the hazardous properties and the possible hazards existing;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Ensure workers’ awareness, proper training, availability of adequate information regarding handling of hazardous materials and waste;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Ensure use of appropriate PPE;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5. Select safer substitutes of hazardous materials, if possible;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6. Prohibit use of lead containing paints, asbestos containing construction materials, mercury containing lighting tubes during rehabilitation activities;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Issue / Potential Impact</td>
<td>Action</td>
<td>Action Party</td>
<td>Costs</td>
<td>Date for Implementation</td>
</tr>
<tr>
<td>--------------------------</td>
<td>------------------------------------------------------------------------</td>
<td>--------------</td>
<td>-------</td>
<td>-------------------------</td>
</tr>
<tr>
<td>7.</td>
<td>Keep the work area well-ventilated, as needed work under local exhaust ventilation;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Store hazardous materials (if any) and waste clearly labeled in specially designated areas, restrict access of unauthorized workers to such areas;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. All hazardous waste (if any) must be collected in leak-proof containers, adequately stored and removed by licensed forwarding companies according to national regulations (Chapter 10.3.2 Document B0.1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. “Hazardous waste” labels indicating type and amount of waste must be placed on the containers (Chapter 10.3.2 Document B0.1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. Transport and disposal of hazardous liquids must be done only by licensed forwarding companies according to national regulations.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>d. Appropriate wastes management procedures for all hazardous waste (handling, collection, segregation, storage and disposal according to National Regulation and international Regulation) shall be adopted.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Ensure that cans and vessels used for hazardous materials and waste are considered as hazardous and stored and disposed accordingly;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Discourage workers from using the PPE worn during handling of hazardous waste and materials for other construction activities;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Decontamination, removal and disposal cement asbestos waste</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Issue / Potential Impact</td>
<td>Action</td>
<td>Action Party</td>
<td>Costs</td>
<td>Date for Implementation</td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>----------------------------</td>
<td>------------------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>Air pollution and dust control</td>
<td>on temporarily disposal area shall be implements in accordance with &quot;Guidelines for Handling Non-friable Asbestos-containing Waste&quot; of Chapter A &quot;Waste management plan&quot; of Annex 4 of this CEMP.</td>
<td>CONTRACTOR</td>
<td>Included in construction costs</td>
<td>During construction period</td>
</tr>
<tr>
<td></td>
<td>1. Regulate the speed level of vehicles and machinery to minimize dust emissions.</td>
<td>Implement provided actions.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Optimize transportation management to avoid needless truck trips.</td>
<td>CONSULTANT/ IA</td>
<td>Monitor implementation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Provide routine service and regular maintenance of vehicles and machines to reduce engine emissions.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Ensure that all vehicles carrying construction materials and waste are covered.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5. Minimize dust emissions through regular water spraying of construction works surfaces.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6. Minimize the amount of excavated material held on site and cover materials if needed to prevent dust emissions.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7. Forbid burning of rubbish on site.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8. Provide workers and vehicle drivers with PPE as needed.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9. Switch vehicles and equipment off when not in use and keep all motorized equipment and vehicles well-maintained.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10. No big construction machines are needed.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11. Noise caused by trucks can be mitigated by good management to avoid unnecessary truck movements.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>12. Movements of big trucks shall not be allowed between 22:00 and 6:00.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>13. Noise generation is restricted to the construction period.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Issue / Potential Impact</td>
<td>Action</td>
<td>Action Party</td>
<td>Costs</td>
<td>Date for Implementation</td>
</tr>
<tr>
<td>--------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>--------------</td>
<td>----------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td></td>
<td>14. Monitor noise involving resident population upon request (if any) and undertake actions to reduce or control noise as needed to meet applicable standards</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>15. Monitor noise at receptor locations upon request (if any) by affected people.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Release of greenhouse gasses from SF6 gas insulated equipment | 1. Ensure that installation and handling of SF6 containing circuit breakers are conducted following the international applied standard. (guidelines: DIN EN* 60376, DIN EN 60480 IEC 62271- Part 303; recommendations of the International Council on large Electric Systems (CIGRE: SF6 Task Force, and ISO 14040)  
2. Use best available technique.  
3. Use detectors to indicate immediately any leakage from which SF6 may be emitted | CONTRACTOR Monitor implementation | Included in construction costs | Prior start of construction and during construction phase |
| Flora and fauna Protection | Minimize and mark areas to be cleared or otherwise disturbed, and ensure workers and equipment stay within marked areas. Avoid impacts on natural habitats and species of concern to the maximum extent possible, including relocation of new roads if feasible, and marking exclusion areas with protective fences/barriers, etc. Ensure workers and equipment do not disturb exclusion areas. If cannot avoid impacts on plants of concern, recover seeds (in season) and relocate plant(s) of concern to another suitable area.  
1. If necessary to protect individual animals or or local populations of concern, schedule construction disturbance so as to minimize the risk of nesting/breeding/rearing failure, and/or relocate project elements (*roads, compounds, other work sites) to as to | CONTRACTOR Monitor implementation | Included in construction costs | During final design and construction period |
<table>
<thead>
<tr>
<th>Issue / Potential Impact</th>
<th>Action</th>
<th>Action Party</th>
<th>Costs</th>
<th>Date for Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>minimize the risk. Restrict workers to construction sites to prevent damage to habitats, prohibit hunting, define smoking areas. 2. If critically endangered plants or animals, or critical natural habitat, cannot be avoided, construction will not begin until after notice is provided to Ministry of Nature Protection and ADB, and until there is agreement on mitigation measures.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human resources policies and procedures</td>
<td>1. Provide realistic information on employment opportunities, with transparent hiring practices. 2. Encourage contractors to maximize local hiring and local materials sourcing. 3. Provide equal opportunities for local workers in accordance with Armenian legislation and ADB requirements, where possible. 4. Ensure non-discriminatory hiring and wage policy in line with Armenian legislation. 5. Prohibit use of child labour and forced labour. 6. Ensure the rights for non-employee workers. 7. Ensure a grievance mechanism for workers to enable individuals/groups to raise reasonable workplace concerns.</td>
<td>CONTRACTOR</td>
<td>Included in construction costs</td>
<td>Prior start of construction and during construction phase</td>
</tr>
<tr>
<td>Workers health and safety,</td>
<td>An H&amp;S Manual and an H&amp;S Management Plan has been developed and will be implemented during the construction phase. H&amp;S Management System (HSMS) has been set up in H&amp;S Management Plan for the construction phase. Plan will apply to all contractor and subcontractor personnel. 1. Be familiar with the contents of the H&amp;S requirements;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Issue / Potential Impact</td>
<td>Action</td>
<td>Action Party</td>
<td>Costs</td>
<td>Date for Implementation</td>
</tr>
<tr>
<td>--------------------------</td>
<td>--------</td>
<td>--------------</td>
<td>-------</td>
<td>-------------------------</td>
</tr>
<tr>
<td>2. Comply with H&amp;S requirements of the contract; H&amp;S Procedure, as well as other relevant policies and applicable national laws;</td>
<td></td>
<td>Monitor implementation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Be responsible for coordinating activities with all the sub-contractors on site;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Be registered with an insurer and ensure that all sub-contractors are registered with insurer;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Maintain a comprehensive and updated list of all sub-contractors and workers on site, indicating the type of works they are doing;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Develop H&amp;S training materials, and ensure that workers (including temporary local workers) attend H&amp;S training and orientation, and are well aware of H&amp;S requirements prior to commencement of their work;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Provide work-specific information to workers on how to protect themselves against hazards;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Provide all procedures required to perform tasks that are inherently harmful and/or hazardous.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>o If during rehabilitation works any potentially hazardous material or product will be supplied the supplier should provide material safety data sheets (MSDS) for all potentially hazardous material or product. In this case the training for the workers that have to deal with supplied hazardous material or product should be provided.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>o First Aid training.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>o Safety training for the whole staff, covering hazards and</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Issue / Potential Impact</td>
<td>Action</td>
<td>Action Party</td>
<td>Costs</td>
<td>Date for Implementation</td>
</tr>
<tr>
<td>--------------------------</td>
<td>--------</td>
<td>--------------</td>
<td>-------</td>
<td>-------------------------</td>
</tr>
<tr>
<td></td>
<td>safety protocols relevant to their jobs.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Specific training in proper management of sanitary, solid, liquid, and hazardous waste.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Specific training for the use of PPE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Ensure the emergency medical aid provision in case of snake and scorpion bites in accordance with the “Emergency medical aid provision in case of snake and scorpion bites” of Chapter C “Emergency response plan” of Annex 4 of this CEMP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Ensure provision of safe work equipment (including PPE), with due care to their suitability, selection, safety features, safe use, inspection and maintenance;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Plan emergency exits, escape routes, traffic routes, danger areas, etc.;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Keep the work sites free from hazards;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Provide safety signs and warning notices;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Conduct regular site safety inspections at work sites;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. In the event of an incident and/or emergency ensure that appropriate procedures are followed and documentation is developed and timely submitted to relevant parties;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Handle hazardous waste generated during the works as well as hazardous materials used during construction / rehabilitation activities; develop all appropriate reports.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. Provide list of H&amp;S risks;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. Assess H&amp;S risks;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. Develop Health &amp; Safety Plan, as necessary;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19. Prepare formats for H&amp;S diary (including incident related</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Issue / Potential Impact</td>
<td>Action</td>
<td>Action Party</td>
<td>Costs</td>
<td>Date for Implementation</td>
</tr>
<tr>
<td>--------------------------</td>
<td>--------</td>
<td>--------------</td>
<td>-------</td>
<td>-------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>20. Define safe working procedures;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>21. Establish preventive and protective measures consistent with international good practice, as reflected in internationally recognized standards such as the EHS Guidelines.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>22. Identify hazardous waste, as relevant;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>23. Appoint H&amp;S responsible personnel.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community Health and Safety</td>
<td>1. To mitigate the disturbance to population, appropriate information on project (including location and duration of construction works) shall be regularly provided to communities.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. The local population should be appropriately informed about the commencement of construction works (information on proposed construction activities should be available on the website of the Ministry of Transport and Communication, local authorities, and also through community newsletters, local TVs and from community leaders).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Notification on commencement of construction works, limitation of vehicle movement, alternative access and detour arrangements shall be provided to affected communities in advance.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. The project shall have an established grievance redress mechanism that will allow affected parties to raise their concerns and obtain feedback. Information on steps of grievance review and redress procedure as well as parties involved in grievance resolution shall be made publicly available and disclosed in affected communities.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Issue / Potential Impact</td>
<td>Action</td>
<td>Action Party</td>
<td>Costs</td>
<td>Date for Implementation</td>
</tr>
<tr>
<td>--------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-----------------------</td>
<td>--------------------------------------</td>
<td>-------------------------</td>
</tr>
</tbody>
</table>
| Noise and vibration control | 1. Avoid locating construction activities, camps, machinery and equipment near sensitive receptors such as houses, schools and other public and residential areas.  
2. Optimization of transportation management to avoid needless truck drives: The trucks will operate only in daylight hours No trucks will operate beyond these working hours.  
3. Schedule noisy activities towards the middle of the day whenever it is practicable.  
4. Reduction of speed of trucks crossing residential areas.  
5. Utilization of modern well-maintained equipment, vehicles, and machinery.  
6. Ensure that all vehicles and equipment are equipped with proper silencers and exclude those that are in improper state for minimizing noise generation at source.  
7. Ensure workers and drivers are provided with appropriate PPE, including ear protective equipment, steel toe boots and safety wests.  
8. Regular maintenance and service of machinery and equipment during construction works. | CONTRACTOR Implement provided actions.  
CONSULTANT/IA Monitor implementation | Included in construction costs | Before starting construction and during construction period |
| Traffic and Access Management | 1. Notify communities and place signs on public roads prior to periods of heavy use.  
2. Plan an adequate way through residential areas  
3. Safety and traffic signs shall be placed clearly near and around the project area to facilitate the approach to the sites.  
4. Signs will be clearly visible and the public warned of all potential hazards | CONTRACTOR Implement provided actions.  
CONSULTANT/IA Monitor implementation | Included in construction costs | During Construction process |
<table>
<thead>
<tr>
<th>Issue / Potential Impact</th>
<th>Action</th>
<th>Action Party</th>
<th>Costs</th>
<th>Date for Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5. Organize the movement of vehicles and machinery in a manner creating the least interference to the flow of traffic.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6. Locate entrances and exits of the construction sites so that they cause minimal disturbance to general traffic and that they do not compromise public safety. Provide signs and flagmen if needed.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7. Train drivers on the requirements of the traffic management plan and safety.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8. Locate parking of machinery in designated sites only.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10. Schedule the movement of vehicles to avoid rush hours where practicable.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11. Ensure that vehicles are provided with and use covering loads when carrying dusty materials Set and enforce speed limits on and off roads</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power supply interruption during construction</td>
<td>Procedures for contractor to notify HVEN and HVEN to notify power stations and other authorities in advance of normal interruption and immediately in case of unplanned interruption. Procedure to mobilize for immediate repairs for unplanned interruptions.</td>
<td>CONTRACTOR</td>
<td>Included in construction costs</td>
<td>Prior start of construction</td>
</tr>
<tr>
<td>Construction Work Camps</td>
<td>1. Obtain an approval of official authorities for the camp locations prior to their establishment.</td>
<td>CONTRACTOR</td>
<td>Included in construction costs</td>
<td>Prior start of Construction and during Construction process</td>
</tr>
<tr>
<td></td>
<td>2. Wastes to be managed as required above.</td>
<td>CONTRACTOR</td>
<td>Included in construction costs</td>
<td>Prior start of Construction and during Construction process</td>
</tr>
<tr>
<td></td>
<td>3. Good housekeeping to maintain safety and cleanliness of the camp.</td>
<td>CONTRACTOR</td>
<td>Included in construction costs</td>
<td>Prior start of Construction and during Construction process</td>
</tr>
<tr>
<td></td>
<td>4. Provision of adequate welfare and toilet facilities (welfare</td>
<td>CONTRACTOR</td>
<td>Included in construction costs</td>
<td>Prior start of Construction and during Construction process</td>
</tr>
<tr>
<td>Issue / Potential Impact</td>
<td>Action</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------</td>
<td>--------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>facilities include washing facilities, changing areas, drinking water and eating facilities):</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5. Ensure adequate supply of water that meets World Health Organization (WHO) standards; a water dispenser may be provided as a secondary supply;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6. Ensure regular maintenance of welfare and toilet facilities;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7. Keep welfare and toilet facilities clean in order to minimize occurrence of disease vectors;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8. Ensure adequate number and location of toilet facilities (including fixed installation of toilets at the site base or at different satellite locations, especially when the coverage of worksite is wide and far from the base; or portable installation at the work site);</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9. Ensure adequate number and location of washing facilities (such as hand basins or bowls, water tap with buckets or receptacles, shower or eye-bath, where necessary);</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10. Provide washing facilities with both cold and hot water and towels or any other item to be used for drying;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>11. Ensure adequate number of location of change, rest and eating facilities (including fixed installation of at the site base or at different satellite locations; or temporary installations at the work site);</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>12. Provide adequate facilities for storing worker’s clothes and PPE; such facilities (including change room) should be easily accessible and should also ensure privacy of the user.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>13. The wastewater from the construction camp should be collected</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Action Party</th>
<th>Costs</th>
<th>Date for Implementation</th>
</tr>
</thead>
</table>

58
<table>
<thead>
<tr>
<th>Issue / Potential Impact</th>
<th>Action</th>
<th>Action Party</th>
<th>Costs</th>
<th>Date for Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>in the septic tank and should be emptied and removed periodically by authorized organization.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emergency Response</td>
<td><strong>Design stage related mitigation measures</strong></td>
<td><strong>CONTRACTOR</strong></td>
<td>Included in design cost</td>
<td>During design stage</td>
</tr>
<tr>
<td></td>
<td>1. Develop and implement Emergency Preparedness and Response plan (Before construction and up to date throughout the project lifecycle)</td>
<td><strong>CONSULTANT/IA</strong></td>
<td>Review design documents</td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. Identify and assess risks to, and potential impacts on the safety of the affected communities during all stages of the project.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. Procedures to inform the public and emergency response agencies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. Establish preventive and protective measures in a manner that is commensurate with the identified risks and impacts.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>d. Tailor the Plan to the risks faced by the project, and include an integrated approach to address emergency needs and protect the health and safety of workers.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>e. Train workers on the aspects of occupational health and safety associated with their work including emergency arrangements</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>f. Inform the affected communities, local authorities and emergency services on the nature and extent of environmental and human health effects that may result from routine operations or unplanned emergencies at the project facility.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction stage related mitigation measures</td>
<td></td>
<td><strong>CONTRACTOR</strong></td>
<td>Included in construction costs</td>
<td>During Construction process</td>
</tr>
<tr>
<td></td>
<td>Develop and maintain emergency response plan, to include:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. Develop and implement procedures to ensure safe handling and storage of hazardous substances (fuel and lubricants, dielectric oil asbestos, etc.).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Posters with emergency response procedures, and clean-up tools</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Issue / Potential Impact</td>
<td>Action</td>
<td>Action Party</td>
<td>Date for Implementation</td>
<td></td>
</tr>
<tr>
<td>-------------------------</td>
<td>--------</td>
<td>--------------</td>
<td>-------------------------</td>
<td></td>
</tr>
<tr>
<td>Readily available on site and train the workers on their proper use.</td>
<td></td>
<td>CONSULTANT/IA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Store equipment for cleaning up spillages properly to ensure it is easily available when needed.</td>
<td></td>
<td>Monitor implementation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In case of a spillage of fuel, oil or lubricants: Clean the area of spillage immediately to prevent potential contamination of soil and groundwater using a dedicated absorbent material. Remove the pollutant, together with the contaminated soil and the absorbent materials and discard to a site approved by MNP.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Locate the fuel/lubricant storage area away from drainage lines and danger areas.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Designate an Emergency Response Team (ERT) response-ready at any time.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provide all construction sites with emergency contact information, responsible persons &amp; safety officer name(s), telephone numbers, etc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Report immediately to the ISC in case of any accidents or incidents</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
7. MONITORING

Monitoring within the Contractor EMP includes and regular environmental monitoring.

The regular environmental monitoring should be implemented in accordance with RA legislation, ADB Safeguard Policy Statement 2009 and IEE.

The regular environmental monitoring contains the planned activities that will guide the Contractor to check and/or compare the effectiveness of the mitigation measures for prevention and control of the negative impacts of the Project. It is also used for measurements and comparative analysis of different parameters whether or not the environmental standards and indicators are maintained or exceeded so immediate and appropriate action can be taken. Environmental monitoring can also point and determine the efficacy of mitigation measures to control unwanted impacts of the Project. The monitoring by the Consultant will allow determining if recommended mitigation measures are being implemented effectively. Environmental monitoring results will be documented to record the signs of adverse impacts, which are detected in order to undertake the corrective actions at the earliest possible time. Where monitoring results do not meet the environmental performance indicators, action taken will also be recorded.

In accordance to the IEE (paragraph 9.6.1. Monitoring measures) regular environmental monitoring will be implemented through the site visits, visual inspections, interviews and record of findings.

Monitoring consists of routine reviews and monitoring to compare the findings with the baseline data and thresholds during the construction phase,

Monitoring shall be implemented through the monitoring site visits of environmental specialists of all Project levels. The site visits are suggested to be carried out in accordance with the monitoring schedule: Contractor - weekly, Consultant - monthly, IA - monthly.

Weekly monitoring records will be collated in Contractors monthly environmental monitoring report and distributed to the Consultant and IA.

The monitoring of the construction activities will be implemented in accordance Environmental monitoring checklist, which is presented in the Annex 3
7.1 Environmental Monitoring and Monitoring Schedule

These are the Parameters to be monitored, locations for monitoring and frequency of monitoring:

<table>
<thead>
<tr>
<th>Location / Activity / Phase (as relevant)</th>
<th>Parameters to be Monitored</th>
<th>Monitoring Location/s</th>
<th>Instruments &amp; Method</th>
<th>Environmental Performance Indicator</th>
<th>Responsible Entities</th>
<th>Frequency (formal monitoring)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CONSTRUCTION PHASE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Legal Requirements</td>
<td>Obtain and maintain all required permits and authorizations for the projects and comply with permit requirements</td>
<td>Construction Site and Contractor’s Office</td>
<td>All activities permitted and authorized as required. Permit Register</td>
<td>Audit findings. Absence of legal warnings / prosecutions.</td>
<td>CONTRACTOR Report to IA/CONSULTANT on permit issuance and compliance status</td>
<td>Prior to activities that require permit/authorization</td>
</tr>
<tr>
<td>Public Consultation and Communication</td>
<td>Provision of regular information to the public about construction works and their progress; Information to Aps about Project’s</td>
<td>All construction sites</td>
<td>Documentation review; Project management inspections and reports. Participation in public consultations; Review of the</td>
<td>Grievance procedure in place and communicated to the public. Minutes of Meetings organized by Contractor are available Report of complaints and resolution.</td>
<td>CONTRACTOR Development and management of the Public awareness activities IA/CONSULTANT Receive the Project Manager’s Report and check the process is correct</td>
<td>According to regular monitoring schedule Plan must be developed and validated prior the commencement of construction activities</td>
</tr>
<tr>
<td>Location / Activity / Phase (as relevant)</td>
<td>Parameters to be Monitored</td>
<td>Monitoring Location/s</td>
<td>Instruments &amp; Method</td>
<td>Environmental Performance Indicator</td>
<td>Responsible Entities</td>
<td>Frequency (formal monitoring)</td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td>-----------------------------</td>
<td>-----------------------</td>
<td>----------------------</td>
<td>-------------------------------------</td>
<td>----------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td></td>
<td>grievance redress mechanism</td>
<td>register of complaints</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soil / Erosion</td>
<td>Erosion and weed invasion of barren ground; Sediment run-off; Topsoil stripping Topsoil stockpiles:</td>
<td>All construction sites; In new cutting areas and slopes</td>
<td>Visual review through the construction sites’ inspections; Project management inspections and reports.</td>
<td>Visits to construction sites sensitive to erosion, drainage sedimentation, as well as topsoil stockpiling sites;</td>
<td>CONTRACTOR Implementation of Protection of the Environment of construction site area in accordance with CEMP Coordinate disposal of soil and excess topsoil with heads of local communities</td>
<td>According to regular monitoring schedule</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>IA/CONSULTANT</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Check that protection actions put in place by the contractor are correct and consistent. Illustrate corrective actions</td>
<td></td>
</tr>
<tr>
<td>Water and soil pollution control</td>
<td>Pollution sources of water and soil; Condition of equipment.</td>
<td>All construction sites;</td>
<td>Visual review through the construction sites’ inspections;</td>
<td>Visits to construction sites sensitive to water and soil pollution;</td>
<td>CONTRACTOR Implementation of Protection of the Environment of construction site area in accordance with CEMP IA/CONSULTANT Check that protection actions put in place by the contractor are correct and consistent. Illustrate corrective actions According to regular monitoring schedule</td>
<td></td>
</tr>
<tr>
<td>Waste and other construction material</td>
<td>Management of waste and construction material during construction</td>
<td>All construction sites</td>
<td>Documentation review; Project management inspections and reports. Site visits</td>
<td>The Waste and Material Management Plan is available; Waste disposal sites and all permits for waste disposal are obtained; Garbage, rubbish and improper construction materials are managed in compliance with Plan’s instructions; A waste register has been developed and is properly maintained</td>
<td>CONTRACTOR Waste and Material Management Plan IA/CONSULTANT Receive the Project Manager’s Report and check the Plan. Illustrate corrective actions and revisions (if any) According to regular monitoring schedule</td>
<td></td>
</tr>
<tr>
<td>Handling</td>
<td>Accidental or</td>
<td>All</td>
<td>Project management</td>
<td>The Emergency Response</td>
<td>CONTRACTOR</td>
<td>According to regular monitoring schedule</td>
</tr>
</tbody>
</table>

Plan must be developed and validated prior the commencement of construction activities.
<table>
<thead>
<tr>
<th>Location / Activity / Phase (as relevant)</th>
<th>Parameters to be Monitored</th>
<th>Monitoring Location/s</th>
<th>Instruments &amp; Method</th>
<th>Environmental Performance Indicator</th>
<th>Responsible Entities</th>
<th>Frequency (formal monitoring)</th>
</tr>
</thead>
<tbody>
<tr>
<td>hazardous substances</td>
<td>chronic leakage or spillage of diesel fuel, oil or other toxic substances</td>
<td>construction sites</td>
<td>inspections and reports. Documentation review; Site visits</td>
<td>Plan and Waste and Material Management Plan is available for review; Accident report forms are completed whenever an accident happened; All accidents are treated in compliance with the Plan; The Emergency Response Team members followed the training</td>
<td>Development of the Emergency Response Plan and Waste and Material Management Plan</td>
<td>monitoring schedule</td>
</tr>
<tr>
<td>Dumping site</td>
<td>Location, layout and dumping site; Nuisances to affected community</td>
<td>Dumping site</td>
<td>Documentation review; Project management inspections and reports. Site visits</td>
<td>The Sites Management Plan is available; The layout of the dumping sites complies with specifications of the Plan; Number and severity of complaints logged in the Register of complaints</td>
<td>CONTRACTOR Development of the Sites Management Plan</td>
<td>Plans must be developed and validated prior the commencement of construction activities</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>IA/CONSULTANT Receive the Project Manager’s Report and check the Plans and the Register of accidents. Illustrate corrective actions and revisions (if any)</td>
<td>According to regular monitoring schedule</td>
</tr>
<tr>
<td>Location / Activity / Phase (as relevant)</td>
<td>Parameters to be Monitored</td>
<td>Monitoring Location/s</td>
<td>Instruments &amp; Method</td>
<td>Environmental Performance Indicator</td>
<td>Responsible Entities</td>
<td>Frequency (formal monitoring)</td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td>-----------------------------</td>
<td>-----------------------</td>
<td>----------------------</td>
<td>-------------------------------------</td>
<td>----------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>Air pollution and dust control</td>
<td>Emission of dust &amp; other air pollutants; Sensitive receptors for dust, noise, etc. located at 200 m or more from construction activities;</td>
<td>All construction sites; Sensitive receptors for dust, noise, etc. located at 200 m or more from construction activities; Project management inspections and reports; Review of the register of complaints;</td>
<td>Visual review through the construction sites’ inspections; Project management inspections and reports.</td>
<td>Number and severity of complaints logged in the Register of complaints; Visits to construction sites sensitive to erosion, drainage sedimentation, as well as topsoil stockpiling sites; Dust emissions, noise &amp; vibration measurements nearby sensitive receptors located at more than 200m from the construction site</td>
<td>CONTRACTOR Implementation of Protection of the Environment of construction site area in accordance with CEMP IA/CONSULTANT Check that protection actions put in place by the contractor are correct and consistent. Illustrate corrective actions</td>
<td>According to regular monitoring schedule (weekly)</td>
</tr>
<tr>
<td>Site Reinstatement, Landscaping, and Re-vegetation</td>
<td>Construction site is cleaned, no material and waste is on-site; Restoration of all surfaces that were used temporarily during construction;</td>
<td>All construction sites</td>
<td>Project management inspections and reports.</td>
<td>All surfaces that were used temporarily during construction are restored to their original state;</td>
<td>CONTRACTOR Development of the Site Reinstatement, Landscaping, and Re-vegetation works Restoration of all surfaces Vegetation restoration works Maintain landscape areas over the period specified in the contract</td>
<td>According to regular monitoring schedule</td>
</tr>
</tbody>
</table>

IA/CONSULTANT
<table>
<thead>
<tr>
<th>Location / Activity / Phase (as relevant)</th>
<th>Parameters to be Monitored</th>
<th>Monitoring Location/s</th>
<th>Instruments &amp; Method</th>
<th>Environmental Performance Indicator</th>
<th>Responsible Entities</th>
<th>Frequency (formal monitoring)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human resources policies and procedures</td>
<td>Site is revegetated</td>
<td>All Construction sites</td>
<td>Documentation review including number of effective job postings intended to local workers, unskilled labour by Contractor Training Register</td>
<td>Number of local workers, unskilled labour (including women) that have been hired on the project. Percentage of employees from local communities, District and Province. List of attendees to the trainings is available;</td>
<td>CONTRACTOR Development of an hiring program for local workers, unskilled labour (including women) Report to IA on local hiring and sourcing</td>
<td>Shall be set when the Contractor is planning its recruitment Review in the mobilization phase of construction activities</td>
</tr>
<tr>
<td>Occupational Health and Safety</td>
<td>Trainings on health &amp; safety provided Uniform and safety equipment provided</td>
<td>All construction sites</td>
<td>Inspection of Occupational Health &amp; Safety documentation Compliance confirmed by project management inspections and reports.</td>
<td>Occupational Health &amp; Safety Plan developed, reviewed/approved, and in place Occupational Health &amp; Safety training(s) of contractor/subcontractors List of attendees to the</td>
<td>CONTRACTOR Development of the Occupational Health &amp; Safety Plan IA/CONSULTANT Receive the Plan and Project Manager’s Report and check that the standards required by ADB and Armenian Law are complied with.</td>
<td>According to regular monitoring schedule Plan must be developed and validated prior the commencement of construction activities</td>
</tr>
<tr>
<td>Location / Activity / Phase (as relevant)</td>
<td>Parameters to be Monitored</td>
<td>Monitoring Location/s</td>
<td>Instruments &amp; Method</td>
<td>Environmental Performance Indicator</td>
<td>Responsible Entities</td>
<td>Frequency (formal monitoring)</td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>-----------------------------</td>
<td>-----------------------</td>
<td>---------------------</td>
<td>--------------------------------------</td>
<td>----------------------</td>
<td>------------------------------</td>
</tr>
<tr>
<td>Noise and vibration control</td>
<td>Noise &amp; Vibration level</td>
<td>All construction sites; Sensitive receptors for dust, noise, etc. located at 200 m or more from construction activities; Project management inspections and reports.</td>
<td>Training Register Register of incidents and/or accidents Inspection of noise level in the construction site; Project management inspections and reports. Review of the register of complaints;</td>
<td>trainings is available; Reports on Construction sites' inspections are available; Reports describing incidents are available Number and severity of complaints logged in the Register of complaints; Noise &amp; vibration measurements nearby sensitive receptors located at more than 200m from the construction site</td>
<td>Illustrate corrective actions and revisions (if any) Review, monitor and supervise the Occupational Health and Safety Plan, and all the Reports provided by the Project Manager. CONTRACTOR Implementation of Protection of the Environment of construction site area in accordance with CEMP IA/CONSULTANT Check that protection actions put in place by the contractor are correct and consistent. Illustrate corrective actions</td>
<td>Continuous during construction and operation According to regular monitoring schedule (weekly)</td>
</tr>
<tr>
<td>Traffic and Access management</td>
<td>Schedules and accesses location; Nuisances and safety issues</td>
<td>Roads use for transportation of equipment, and materials; Project management inspections and</td>
<td>Documentation review; Project management inspections and</td>
<td>Number and severity of complaints logged in the Register of complaints</td>
<td>CONTRACTOR Organization of transportation of construction materials, wastes and equipments in accordance with</td>
<td>According to regular monitoring schedule</td>
</tr>
<tr>
<td>Location / Activity / Phase (as relevant)</td>
<td>Parameters to be Monitored</td>
<td>Monitoring Location/s</td>
<td>Instruments &amp; Method</td>
<td>Environmental Performance Indicator</td>
<td>Responsible Entities</td>
<td>Frequency (formal monitoring)</td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td>-----------------------------</td>
<td>-----------------------</td>
<td>----------------------</td>
<td>-------------------------------------</td>
<td>----------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>Related to communities; Damages to roads and utilities</td>
<td>Accesses to the construction site</td>
<td>reports. Site visits</td>
<td></td>
<td></td>
<td>CEMP IA/CONSULTANT</td>
<td>Receive the Project Manager’s Report and check the Register of complaints and the Register of accidents. Illustrate corrective actions</td>
</tr>
<tr>
<td>Vegetation Clearing</td>
<td>Vegetation clearing is minimized to the extent possible; Vegetation near Works’ sites is protected</td>
<td>All construction sites</td>
<td>Project management inspections and reports. Review of all documentation related to vegetation clearing; Construction sites’ inspections</td>
<td>Mitigation measures are put in place for protecting biodiversity before construction activities commence; The register of cut trees and shrubs is available</td>
<td>CONTRACTOR IA/CONSULTANT</td>
<td>According to regular monitoring schedule</td>
</tr>
<tr>
<td>Construction Work Camps</td>
<td>Location, layout and management of work camps Workers</td>
<td>Work camps</td>
<td>Contractor’s labour accommodation strategy and principles</td>
<td>The location and the layout of the Construction Work Camp(s) comply with location and layout that has been</td>
<td>CONTRACTOR</td>
<td>According to regular monitoring schedule</td>
</tr>
<tr>
<td>Location / Activity / Phase (as relevant)</td>
<td>Parameters to be Monitored</td>
<td>Monitoring Location/s</td>
<td>Instruments &amp; Method</td>
<td>Environmental Performance Indicator</td>
<td>Responsible Entities</td>
<td>Frequency (formal monitoring)</td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>----------------------------</td>
<td>-----------------------</td>
<td>----------------------</td>
<td>-------------------------------------</td>
<td>----------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>Utilities Protection and Relocation (if any)</td>
<td>accommodation established on the basis of Armenian and ADB standards</td>
<td>documentation. Compliance confirmed by project management inspections and reports Documentation review; Work camps’ visits</td>
<td>previously agreed; Number and severity of complaints logged in the Register of complaints</td>
<td>IA/CONSULTANT Receive the Project Manager’s Report and check that it complies with the standards required by ADB and Armenian Law</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Records and reporting</td>
<td>Cases of disruption of services impacting end users; Re-located of utilities is implemented where needed</td>
<td>Project management inspections and reports Review of all documentation related to Utilities Protection and Relocation’ Review register of complaints</td>
<td>Number and severity of complaints logged in the Register of complaints Utilities discovered during constructions works did not lead to interruption of services to end users</td>
<td>CONTRACTOR Implementation of relocation of the Utilities IA/CONSULTANT Receive the Project Manager’s Report and check the process is correct</td>
<td>According to regular monitoring schedule</td>
<td></td>
</tr>
<tr>
<td>Records and reporting</td>
<td>Site inspection checklists; Site inspection reports</td>
<td>Recorded information</td>
<td>Review</td>
<td>All available, recorded correctly, any follow-up has</td>
<td>CONTRACTOR Completes and monitors checklists, The Contractor transfers documents</td>
<td></td>
</tr>
<tr>
<td>Location / Activity / Phase (as relevant)</td>
<td>Parameters to be Monitored</td>
<td>Monitoring Location/s</td>
<td>Instruments &amp; Method</td>
<td>Environmental Performance Indicator</td>
<td>Responsible Entities</td>
<td>Frequency (formal monitoring)</td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td>-----------------------------</td>
<td>-----------------------</td>
<td>---------------------</td>
<td>-------------------------------------</td>
<td>----------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td></td>
<td>Site inspection minutes;</td>
<td></td>
<td></td>
<td>been carried out as required</td>
<td>logs, consultation records, training records, grievance records, reports, etc.; Obtains Licenses, agreements and permits</td>
<td>monthly at minimum</td>
</tr>
<tr>
<td></td>
<td>Register books;</td>
<td></td>
<td></td>
<td></td>
<td>IA/CONSULTANT</td>
<td>Consultant/IA submits a monthly and quarterly progress reports</td>
</tr>
<tr>
<td></td>
<td>Consultation records;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>IA prepares a biannual report to ADB</td>
</tr>
</tbody>
</table>
8. RESPONSIBILITIES FOR IMPLEMENTATION MITIGATION MEASURES AND MONITORING

8.1 Institutional Responsibilities

Institutional responsibility for implementation of the proposed mitigation measures will be shared among the following agencies:

i. Construction agencies


ii. Project Supervision and management Consultant (PSMC)

Direction and control of works is the responsibility of CESI S.P.A, INCICO S.P.A. (JV).

iii. Monitoring agencies

Liaoning- EF ACEC Electrical Equipment Co., LTD (LEEEC) & Northeast China International Electric Power Corporation (NEIE) JV has the primary responsibility for monitoring work on a weekly basis.

Monitoring can also be carried out by the IA, MNP and communities.

Roles and responsibilities of the Employer must be defined according to the IEE. As far as responsibilities during monitoring are concerned, we must comply with what specified in IEE (paragraphs 4.9.2; 9.18 and 9.1.9).

From the Document we can clearly understand that HVEN as IA for the rehabilitation of the substations shall nominate a person who shall be responsible for the implementation of the CEMP. In addition, a PSMC shall be recruited being responsible, among others, for monitoring/supervision of the CEMP implementation.

Within this PSMC an environmental specialist shall be employed for the duration of the construction period of about 2.5 years. He/She shall also carry out the overall supervision of EMP implementation.

The PSMC shall support and assist the HVEN with respect to implementation of the CEMP. The specialists shall perform regular site visits (audits) and assist HVEN in their reporting duty (monthly monitoring reports). Aim is that all mitigation measures are implemented adequately. In case of discrepancies the specialists shall implement proper actions to establish compliance with the CEMP. If this is not possible and if the discrepancy is
considered to be severe, the person(s) in charge shall be empowered to stop the work immediately until compliance is achieved again. 

The PSMC will be responsible for conception and implementation of all monitoring activities during the construction phase and provide training to relevant staff of the operator in order to ensure that all monitoring activities for both the construction and operation phases can be executed in an appropriate manner.

HVEN as Project owners shall prepare monthly Safeguard Monitoring Reports including the progress of the implementation of the CEMP. HVEN will be assisted by the PSMC in this reporting procedure. These reports shall be submitted to HVEN and distributed to all involved departments including ADB. The reports shall contain all discrepancies from the CEMP and list all HSE relevant incidents and accidents that occur during the implementation of the refurbishment measures. Based on these reports and own construction site audits the PSMC together with HVEN will prepare semi-annual performance and monitoring reports and submit them to ADB.

8.2 General responsibilities of the Contractor for Managing the CEMP

The Contractor shall be responsible for the following:

- ensure compliance with permissions, licenses and approvals;
- submit compulsory Methods Statements relevant to each project phase for approval by the Environmental Manager/Environment Specialist before any work is undertaken;
- Implement environmental protection measures as described in the approved CEMP;
- Brief all sub-contractors on the requirements of the CEMP;
- Provide copies of the CEMP to each subcontractor bearing any responsibilities within the project;
- Ensure that the full and complete implementation of the CEMP is made by subcontractors;
- Ensure that requirements of the CEMP are complied with by subcontractors;
- Audit and report subcontractors' implementation of the CEMP and compliance with the requirements of the assessment study and their quality systems;
- Monitor and report on the performance of environmental protection measures in accordance with the requirements of the CEMP;
- Convene environmental team meetings and meetings of all the actors involved.

It is the responsibility of the Contractor and all subcontractors to comply with the requirements contained in the approved CEMP and all applicable environmental regulations, and CEMP compliance stipulations should be contained in any contractual documents between the parties.

The following Table 6 is described the roles and responsibilities of the Contractor's staff in the process of rehabilitation of Agarak-2 substation.
### Table 7. The Roles, responsibilities and contact details of the Contractor’s staff

<table>
<thead>
<tr>
<th>Position</th>
<th>Responsibilities</th>
<th>Name</th>
<th>Contact details</th>
</tr>
</thead>
</table>
| General Project Director        | • Personnel management  
• Safety of work  
• Monitoring of construction, installation, commissioning work  
• Quality control and schedule of the project  
• Financial management of the project  
• Preparation of work quantities and submit to employer for approval | Meng Wei                 | leecarmeniaproject@gmail.com                         |
| Deputy General Director         | • Project Coordination, including CEMP implementation  
• Business Negotiations,  
• Contract management  
• Settlement of legal, tax and customs issues  
• Settlement of payments  
• Recruitment and management of local employees  
• Review of the CEMP | Karen Khudoyan           | leecarmeniaproject@gmail.com                         |
| Chief Engineer                  | General management of technical and design issues  
. Develop programs and plans for construction Engineering Quality Supervision  
. Organization and control of installation and commission work in accordance with CEMP | Tang Juntong             | leecarmeniaproject@gmail.com                         |
| Business Manager                | • Submission of monthly work report, including CEMP required monthly reports  
• Preparation of meeting minutes  
• Document management  
• Financial management | Fan Zhenzhi              | leecarmeniaproject@gmail.com                         |
| Civil Engineer and Site Manager of Agarak | • Management of civil works construction;  
• Supervision of quality, safety, schedule of civil construction works;  
• Preparation and archiving of civil works documents submitted to HVEN;  
• Examination of civil work quantities,  
• Responsible for the implementation of CEMP in the construction site | Artavazd Avetisyan       | leecarmeniaproject@gmail.com                         |
| Environment Specialist          | Preparation of Contractors’ Environmental Management Plan | Armine Hayrapetyan       | urmmino@yandex.com                                  |

![Chart 1. Contractor’s staff responsible for the CEMP implementation](chart1.png)
General Project Director is responsible for the overall management of environmental/health & safety/social safeguards, planning, organizing and implementing the mitigation measures set in CEMP, coordination of environmental, occupational health and safety and social activities, preparation of safeguard’s working documents like site-specific environmental management plans, liaison with local authorities, daily monitoring of implementation by the Contractor the mitigation measures, training of the Contractor’s and sub-contractor’s engineering and working staff on environmental safeguards.

Environmental Specialists will be involved at all Project levels: IA, PSMC and Contractor. Regarding the implementation, the supervision and the monitoring of the CEMP, responsibilities, roles, tasks and frequencies are as follow:

- Contractor’s supervising team and environmental specialist are responsible for overall management of environmental safeguards and implement the mitigation measures set in EMP and their related monitoring activities on a daily basis;
- Environmental specialist documents monitoring activities and results in a weekly environmental report;
- In case of inadequate monitoring results, Environmental specialist identifies the necessary corrective actions through a Corrective Action Plan as soon as possible and reports on correction within the next weekly report;
- In cases of accidents (fire, explosion, oil spill, etc.), the Contractor must notify the Engineer immediately and then proved Incident report in accordance with format. Initial notification might be verbal, but must be followed by a written report within 24 hours after the incident or accident happened;
- Environmental specialist identifies the sites used for construction purposes outside the RoW (for dumping of disposal of and waste, etc.), notifies the Engineer and prepares site-specific environmental management plans for the site use;
- Environmental specialist prepares monthly environmental report as part of Contractor’s monthly progress report.

The Contractor’s organizational flowcharts presented in the Annex 5

9. RESPONSIBILITIES FOR REPORTING AND REVIEW

9.1 Contractor’s Environmental Report

Every month the Contractor will prepare a Contractor’s Environmental Report (CER). The report will be prepared by the Environmental Manager. The report will outline progress with physical monitoring targets and implementation of the CEMP for these works.

The report will inform about the status of the construction works, and specify if any defect notices have been issued by the Employer to correct work and what has been done by the Contractor to address these issues. Any complaints or issues that have been received from the public will be included in this monthly report.

75
The report will contain the following sections:

1. Status of work programme, work completed, construction underway and work planned.
2. Environmental staff situation for month
3. Staff training and awareness carried out – use attached form
4. Environmental incidents – includes spills of fuel and oil and other hazardous materials which have to be reported to the MNP.
5. Monitoring
   a. Weekly monitoring reports – attach weekly monitoring reports
6. Defect notices received and status of all non-conforming work – list the non-compliance notices sent by Consultant and how these were addressed.
7. Waste volumes, types and disposal – attach the waste reporting form and explain any anomalies in the report.
8. Complaints received – list all complaints received and how these were addressed
10. Contamination reported and areas rehabilitated – list any of these incidents and how they were addressed.
11. Ecological issues – list any Red Book flora or fauna affected by the project and steps taken to mitigate impacts.
12. Other relevant environmental issues – as required

The Report must be in electronic format and must be sent to IA and PSMC each end of the month.

9.1.1 Supporting Documents for the CER

The following documents are to be completed and attached to the CER. These are to be supported by written text as required to better explain the information supplied in the forms.

The forms are:

i. Staff Training Report
ii. Waste Report
iii. Monthly Accident Report

i. Staff training report

Month, Year ...................

(i) Technical, (ii) Field Staff or (iii) Sub-contractor staff (use one form for each type of staff)
ii. Waste report

Waste registration month .................. Year............

<table>
<thead>
<tr>
<th>Type of waste</th>
<th>Removed waste (m³)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Previous month</td>
<td>Current month</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

iii. Environmental Incidents Form

1. Date and time:
2. Region:
3. Community:
4. Location:
5. Project/Activity:
6. Construction Contractor:
7. Construction sub-contractor (if any):
8. Technical Supervision Consultant:
9. Incident type:
10. Severity of impact:
    □ High (interruption to works exceeding one day)
    □ Medium (short-term interruption to works not exceeding one day)
11. Reported by:
12. Reported to:
    □ Technical Supervision Consultant
    □ Recipient of Funding / Borrower
13. Reported on (date and time):
14. Description of incident root cause:
15. Corrective action taken:
16. Corrective action to be taken:
17. Action taken to prevent recurrence:
18. Corrective action carried out by:
19. Issue resolved and closed out by:
20. Close out date:
21. Party / person involved:
22. Machinery / equipment involved:
23. Contractor / sub-contractor involved:
24. Third party involvement:
iv. Environmental Incident Register

<table>
<thead>
<tr>
<th>Date, time</th>
<th>Accident location</th>
<th>Name of the worker</th>
<th>Provided tasks during the accident</th>
<th>What kind of injury</th>
<th>Treated in hospital or ambulatory</th>
<th>Missed working days (number)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

9.2 Revision of CEMP Document

This CEMP will be revised by Contractor’s environmental specialist as required to meet changed conditions, although any requests and alterations of the CEMP can only be approved by the Consultant.

9.3 Complaints Register

A complaints register will be maintained that outlines the complaint and how it was dealt with. The Complaints Register will be kept at the Contractor’s site office and will be available for inspection.

10. ENVIRONMENTAL TRAINING AND AWARENESS

To proper implementation of the CEMP the Contractor’s Environmental Specialist should be organize and held a general environmental awareness training course for Contractor’s and all sub-contractors staff about their own responsibilities in relation to the CEMP and sub-plans.

The training will include:

1. Significant potential environmental impacts and the importance of mitigation.
2. Location of sensible receptors.
3. Importance and relevance of the CEMP and sub-plans.
4. Roles and responsibilities in relation to compliance with consents and designations, permits and operating procedures.
5. Familiarization with site environmental controls.
7. Hazard and risk management to ensure that the staff may fully understand the potential impacts and the proposed mitigation measures.
8. Accident, incident, spill reporting and methods for environmental prevention.
10. Familiarization with Environmental Monitoring.
11. All other relevant information that the Contractor shall communicate.

11. ENVIRONMENTAL RESPONSIBLE PROCUREMENT

All goods and materials used on site will be procured in accordance with environmentally responsible procurement procedures that are in keeping with national and international regulations including the Stockholm Convention on Persistent Organic Pollutants or use any products that fall within the WHO Recommended Classification of Pesticides by Hazard Classes; 1a (extremely hazardous) and 1b (highly hazardous) or Class II moderately hazardous).

12. PUBLIC CONSULTATION AND COMMUNICATION

In the frame of the project during preparation of the IEE Fichtner company on 17th of March, 2014 was organized the Public consultation meeting in the Agarak community. The intention of the consultation meeting was to forewarn the community of the likely changes in a timely manner so that they had time to adapt to the project impacts and prepare themselves proactively rather than reactively. Accordingly the IEE has been developed taking into account adapting to suit community needs. Grievance procedure was also be enacted during this stage.

On 12 of August, 2016 the Construction contractor in the frame of his responsibilities organized the meeting with the Head of Agarak community. During the meeting the Head of community was informed of the works to be done in the Agarak-2 substation, about possible environmental impact and mitigation measures.

Before commencing construction works, a the communication meeting/public hearing will be prepared and organized with the members of Agarak community, in order to explain the works, the schedule, possible environmental impact, mitigation measures and so on. The meeting will take into account their requirements and needs. A process will be developed whereby community members and other stakeholders may make complaints and be assured of receiving responses within a reasonable period.
All public consultation and materials presented at the consultation will be presented in the Armenian language. All meetings will be open to the public and women will be encouraged to attend.

Local people will be encouraged to seek employment on the project.

A Community Communications Plan is attached to the CEMP as Chapter C of the Annex 4.

13. ACCOUNTABILITY & GRIEVANCE REDRESS MECHANISM

13.1 ADB’s Accountability Mechanism

ADB website presents the Accountability Mechanism (AM) as a forum where people adversely affected by ADB-assisted projects can voice and seek solutions to their problems and report alleged noncompliance of ADB’s operational policies and procedures.

ADB remains firmly committed to the principle of being accountable for complying with its operational policies and procedures, and solving problems of project-affected people and ensures high standards of accountability, transparency, openness, and public participation.

The AM policy of 2012 which, as presented in their website (http://www.adb.org/documents/accountability-mechanism-policy-2012) is designed to:

(i) enhance ADB’s development effectiveness and project quality;
(ii) be responsive to the concerns of project-affected people and fair to all stakeholders;
(iii) reflect the highest professional and technical standards in its staffing and operations;
(iv) be as independent and transparent as possible; and
(v) be cost-effective, efficient, and complementary to the other supervision, audit, quality control, and evaluation systems at ADB.

The ADB AM executes the tasks via the problem solving function which assists people who are directly, materially, and adversely affected by ADB-assisted projects to find solutions to their problems. Contractor shall inform the APs on the ADB AM as an alternative opportunity for solving of problems.

13.2 Grievance Redress Mechanism

For receiving feedbacks, concerns and complaints from the APs, a Grievance Redress Mechanism (GRM), inspired by the ADB’s guidelines and policies shall be maintained for the duration of the Project. The Grievance Redress Mechanism is intended to assist
aggrieved persons in lodging their complaints and to describe the mechanism designed to redress their grievances in a timely and effective manner. The parties potentially involved are: the complainants, Contractor, Consultant, IA, NGOs, and the courts.

The following are the procedural steps to file a complaint, pose an inquiry on matters relating to project implementation, environmental concerns and other issues regarding the Project.

**Step 1:** The person affected by the Project could raise their suggestions/concerns/complaints first of all to the Contractor’s dedicated grievance staff that is an attempt will be made to resolve complaints at the local level. In order to maintain transparency and accountability to affected communities and to make information, assistance and grievance resolution services accessible to the Affected Persons, the Contractor will establish the following GRM as a part of the Project’s integral GRM:

(i) AP’s could approach Contractor’s representative (construction foreman, engineer, social or environmental specialist) on-site and/or register their suggestion/complain into the grievance register book kept by Contractor at the field office nearby the RoW.

(ii) Contractor ensures the provision of contact information (field office location, operating hours, names of responsible contact persons, phone numbers, regular mail and email addresses, etc.) via posters and Project informational boards

Contact details of contractor for questions, complains and recommendations are as follows:

**LIAONING-EFACEC ELECTRICAL EQUIPMENT Co., Ltd**

Add: 23# BLDG, NO.18 courtyard, Kechuang NO.13 St., BDA, Beijing, China

Tel: 0086-10-56386063(ext.307)

Fax: 0086-10-56386062

**Step 2:** Should the Consultant fail to satisfy the complain, AP could apply to IA and ADB. All the contact information shall be provided by Contractor on posters and on the Project informational board. Contractor shall provide the necessary explanations and assistance in application to the mentioned entities, if needed through the personal contact with AP.

Finally the AP can always seek attention and interference of NGOs and the court. However all the efforts will be made to settle the issues at the Contractor’s, the Consultant and IA level. If not possible, attempts will be made to resolve the issues at the EA level to avoid/minimize litigation as much as possible.

All complaints regardless of the outcome and solutions will be properly documented and made available for review, monitoring and evaluation purposes.

Contact details for questions, complains and recommendations from the external stakeholders of the IA (HVEN) are as follows:
The foremen of the construction sites should be provided with the Complaints Log (provided below) to organize the registration of complaints.

### COMPLAINT LOG SHEET

<table>
<thead>
<tr>
<th>Complaint number</th>
<th>Date of the complaint acceptance</th>
<th>Name and address of the complaint</th>
<th>Method of complaint submission (personally, by phone, by letter, by internet, etc.)</th>
<th>Complaint content (issue description)</th>
<th>Complaint solution method /mitigation activity</th>
<th>State of the complaint solution*</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Filed by Contractor Specialist: __________________________

Date: __________________________
14. REFERENCES AND SOURCES OF INFORMATION

1. ADB safeguard policies.
2. "Initial Environmental Examination (IEE) for SCADA, s/s Agarak 2 and s/s Shinuhayr" Prepared by Fichtner for the Ministry of Energy and Natural Resources (MENR) of Armenia and for the Asian Development Bank (ADB) in 2014
8. www.syunik.am – Syunik regional administration (marzpetaran) web-page
9. Four-years development programme of the Agarak urban community for the years 2013-2016
10. Meghry Gravity scheme ESIA, MCA Armenia, 2009
ANNEXES

Annex 1: The permit for dumping site was obtained from head of Agarak community ....0
Annex 3: Environmental monitoring checklist ................................................................5
Annex 4: Operating Plans ..........................................................................................10
  A: WASTE MANAGEMENT PLAN .....................................................................10
  Guidelines for Handling Non-friable Asbestos-containing Waste .....................17
  B: SITE MANAGEMENT PLANS FOR DUMP SITES ........................................22
  C: EMERGENCY RESPONSE PLAN ................................................................24
    Emergency medical aid provision in case of snake and scorpion bites ..........41
  C: COMMUNITY COMMUNICATIONS PLAN .................................................49
Annex 5: The Contractor’s organizational flowcharts ...........................................52
Annex 6: Project schedule and milestones .............................................................52
Annex 7: Contractor’s HSE policy ........................................................................52
Annex 1: THE PERMIT FOR DUMPING SITE WAS OBTAINED FROM HEAD OF AGARAK COMMUNITY
THE HEAD OF AGARAK COMMUNITY OF SYUNIK REGION OF EPUBLIC OF ARMENIA

Decree

12 of August 2016 N150-A

On permit “Liaoning-EFACEC Electrical Equipment” LLC to collect and transport the construction and bulky waste generated from the construction

Guided by the 17th article, 12th point of the 37th article of the Law of the Republic of Armenia on “Local Self-Government”; by the 5th point of the 8th article of the Law of the Republic of Armenia on “Waste Removal and Sanitary Cleaning”; by the e) point of the 8th article of the Law of the Republic of Armenia on “Local Taxes and Fees”,

Based on the Agarak Community Council of Elders Decision N49 of 11th December, 2015 and the letter N384/1 of 11th August, 2016 addressed to the head of the community by the “Liaoning-EFACEC Electrical Equipment” LLC deputy head Karen Khudoyan,

It was decided

1. to permit “Liaoning-EFACEC Electrical Equipment” LLC to collect and transport the construction and bulky waste generated from the construction works at “Agarak-2” substation of “HVEN” CJSC to the Communal infrastructure area located on 90 Sayat-Nova St.
2. to suggest “Lioning-EFACEC electrical equipment” Ltd pay the construction and bulky waste disposal and transportation permit fee (500AMD for 1m³ waste) approved by the Community Council of Elders Decision N49 of 11th December, 2015.

Head of Community A.Zakaryan

2016 August 12
Agarak Community
Annex 2: RA GOVERNMENT DECISION N1221 DATED OCTOBER 22, 2015

ՀՀ ԿԱՐԱՎԱՐՈՒԹՅՈՒՆ

ՀՀ ԿԱՐԱՎԱՐՈՒԹՅՈՒՆ

կարգավորում չի հրապարակվել

ՀՀ ԿԱՐԱՎԱՐՈՒԹՅՈՒՆ

Երևան

22.10.2015

Ա. Թույլատրել Հայաստանի Հանրապետության էներգետիկայի և բնական պաշարների նախարարության «Բարձրավոլտ էլեկտրացանցեր» փակ բաժնետիրական ընկերությանը (այսուհետ ընկերություն) սեփականության իրավունքով իրեն պատկանող շահագործման դուրս գրված օգտվող համար ոչ պիտական մեծության լուծարումից առաջացող սույն որոշումը հավելվածում նշված 20370,35 հագ. դրամ շուկայական արժեքով (առանց ԱԱՀ-ի) սև և գունավոր մետաղների ջարդոնով (այսուհետ գոյք) վճարել ընկերության կողմից տեղաբաշխված պետությանը պատկանող համապատասխան թվով բաժնետոմսերի Հայաստանի Հանրապետության օրենսդրությամբ սահմանված կարգով ձեռքբերման 3. Սույն որոշման 1-ին կետի ժամանակ հաշվարկվող ավելացված արժեքի հարկը վճարել «Հայաստանի Հանրապետության 2015 թվականի պետական բյուջեի մասին» Հայաստանի Հանրապետության օրենքի 9-րդ հոդվածի 9-րդ մասով սույնների վրա հավանաբար Հայաստանի Հանրապետության պաշտպանության նախարարության տնօրինությանը: 4. Հայաստանի Հանրապետության էներգետիկայի և բնական պաշարների նախարարության Հայաստանի Հանրապետության պաշտպանության նախարարության տնօրինությունը տնօրինության գլխավոր գործիչների կողմից գիտելիքով սույնուշտում Հայաստանի Հանրապետության պաշտպանության նախարարության տնօրինությունը տնօրինության գլխավոր գործիչի կողմից էլեկտրական համակարգի համար մասնակցելու համար էլեկտրական համակարգի համար մասնակցելու համար մասնակցելու համար մասնակցելու համար մասնակցելու համար մասնակցելու համար մասնակցելու համար մասնակցելու համար մասնակցելու համար մասնակցելու համար
Government of the republic of Armenia

Decision N1221U dated October 22, 2015

Regarding reducing the statutory capital of “high voltage electric networks” close joint stock company and handing over the property

Based on the 36th clause and the 7th part of 68th clause of law of the RoA “About Stock Companies”, the government of the RoA decides:

1. To permit “High Voltage Electric Networks” Close Joint Stock Company (hereinafter Company) to purchase the respective number of shares, allocated by the company and belonging to the government as per the legislation, stipulated by the order of the RoA, by the amount of market value (without VAT) i.e. 20370.35 thousand drams, which arisen from the scrap of black and non-ferrous metal of the equipment (hereinafter property), belonging to HVEN CJSC and now considered as an unserviceable for further use.

2. To reduce the statutory capital of the company with the respective amount according to the order stipulated by the legislation of the RoA by the repayment of shares purchased by the Company.

3. To pay the VAT amount calculated during the separation of property according to the 1st item of this Decision as stipulated in the 9th part of the 9th clause of “RoA State Budget 2015” of the law of the RoA.

4. To hand over the property mentioned in the 1st item of this Decision and purchased by the RoA to the possession of the Ministry of Defense of the RoA.

5. To instruct the RoA Minister of Energy and Natural Resources of the and the RoA Minister of Defense of the to provide the performance of the works regarding the handing over of Company’s property to RoA Ministry of Defense, as is mentioned in the 1st item of this Decision, according to the legislation of the RoA, after this Decision becomes into effect.

Prime Minister of the RoA

H. Abrahanyan

October 26, 2015

Yerevan
## Annex 3: ENVIRONMENTAL MONITORING CHECKLIST

### MITIGATION COMPLIANCE & INSPECTION MONITORING Report (Agarak-2 substation)

<table>
<thead>
<tr>
<th>Project:</th>
<th>Power Transmission Rehabilitation</th>
<th>Implementing Agency:</th>
<th>&quot;HVEN&quot; CJSC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scope of Inspection</td>
<td>Rehabilitation of Agarak-2 substation</td>
<td>Contractor:</td>
<td></td>
</tr>
<tr>
<td>Weather Condition</td>
<td></td>
<td>Monitored by (Name &amp; Position):</td>
<td></td>
</tr>
<tr>
<td>Date:</td>
<td></td>
<td>Monitoring visit was carried out with the presence of:</td>
<td></td>
</tr>
</tbody>
</table>

### WORK SITE: General

Environmental management: environmental team, health& safety, emergency, trainings, grievance redress mechanism

<table>
<thead>
<tr>
<th>Construction Activity</th>
<th>Mitigation Measure (as per CEMP)</th>
<th>Mitigation/corrective action Implemented</th>
<th>Comments</th>
<th>Resolution Status of previous Corrective Action Request (resolved/outstanding actions required)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Environmental team</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All activities 1.</td>
<td>Person in charge on environmental management is appointed and is present on-site</td>
<td>Yes / N/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All activities 2.</td>
<td>Person in charge on H&amp;S management is appointed and is present on-site</td>
<td>Yes / N/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All activities 3.</td>
<td>Person in charge on emergency management is appointed and is present on-site</td>
<td>Yes / N/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Health&amp; safety</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All activities 4.</td>
<td>Warning signs and exclusion barriers erected around work site areas insufficiently</td>
<td>Yes / N/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All activities 5.</td>
<td>Access of strangers and outsiders is excluded</td>
<td>Yes / N/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All activities 6.</td>
<td>Workers are provided with and are using the uniform, applicable safety/protection equipment for site conditions</td>
<td>Yes / N/A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All activities</td>
<td>7.</td>
<td>Sanitary-hygienic conditions for workers are provided: drinking and washing water supply, mealtime utilities, toilets, rest time, etc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All activities</td>
<td>8.</td>
<td>First aid kit is available on-site and is accessible to all workers.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All activities</td>
<td>9.</td>
<td>Fire extinguisher are available</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Emergency Response Plan**

| All activities | 10. | Copy of ERP and emergency contact list are available, updated and posted in a visible place at all work sites |
| All activities | 11. | Accident registry and report forms are available |
| All activities | 12. | Damage of utilities and/or other structures managed |

**Trainings and orientation courses**

| All activities | 13. | Workers briefed on CEMP at time of starting employment |
| All activities | 14. | Workers briefed on ERP at time of starting employment |
| All activities | 15. | Job-specific environmental and safety training for workers provided |

**Work site cleanliness**

<p>| All activities | 16. | The work site kept clean from debris, garbage, etc. |
| All activities | 17. | Is the proper storage for fuel, oil and construction materials arranged and located within the existing right-of-way? |
| All activities | 18. | Are the places of preliminary accumulation of excavated and demolished materials and construction wastes arranged and located within the existing right-of-way? |
| All activities | 19. | Are the places of preliminary accumulation of hazardous wastes arranged and located within the existing right-of-way? |
| All activities | 20. | Is the timely removal of excavated and demolished materials and construction waste from the places of... |</p>
<table>
<thead>
<tr>
<th>All activities</th>
<th>21.</th>
<th>Are labelled containers /areas provided for waste segregation and facilitation of recycling (if possible)?</th>
</tr>
</thead>
<tbody>
<tr>
<td>All activities</td>
<td>22.</td>
<td>Bins for garbage collection are installed</td>
</tr>
<tr>
<td>All activities</td>
<td>23.</td>
<td>Tires of trucks are cleaned before entering roads and roads are not muddy</td>
</tr>
<tr>
<td>All activities using liquid materials</td>
<td>24.</td>
<td>Spillages are managed properly</td>
</tr>
<tr>
<td><strong>Public communication and grievance redress mechanism: environmental issues</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All activities</td>
<td>25.</td>
<td>Meeting with community members on construction activities, environmental impacts and mitigation measures held</td>
</tr>
<tr>
<td>All activities</td>
<td>26.</td>
<td>Register of complaints is available</td>
</tr>
<tr>
<td>All activities</td>
<td>27.</td>
<td>Complains observed during the last visit are addressed</td>
</tr>
<tr>
<td>All activities</td>
<td>28.</td>
<td>People are notified on inconveniences: turn off of water supply, electricity supply, etc.</td>
</tr>
<tr>
<td><strong>Environmental parameters</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Earth works, material delivery, removal of existing pavement, asphalt pavement</td>
<td>29.</td>
<td>Presence of covers on the trucks transporting construction materials and waste</td>
</tr>
<tr>
<td></td>
<td>30.</td>
<td>Dust control measures are effective</td>
</tr>
<tr>
<td></td>
<td>31.</td>
<td>Are the stockpiles of loose materials covered?</td>
</tr>
<tr>
<td></td>
<td>32.</td>
<td>Construction sites watered</td>
</tr>
<tr>
<td></td>
<td>33.</td>
<td>Equipment and haul vehicles are fitted with effective emission control equipment</td>
</tr>
<tr>
<td>Operation of machinery while earth works, material</td>
<td>34.</td>
<td>Equipment fitted with effective silencers</td>
</tr>
<tr>
<td></td>
<td>35.</td>
<td>Are the idle vehicles, machinery and equipment turned off or throttled down?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>----------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>36.</td>
<td>Construction works are carried out according to schedule (e.g. work in the daytime)</td>
<td></td>
</tr>
<tr>
<td>37.</td>
<td>Vibration works are carried out according to schedule (e.g. work in the daytime)</td>
<td></td>
</tr>
<tr>
<td>38.</td>
<td>Excavated slopes stabilised</td>
<td></td>
</tr>
<tr>
<td>39.</td>
<td>Are the proper solutions provided for accumulation and discharge of wastewater at construction site?</td>
<td></td>
</tr>
<tr>
<td>40.</td>
<td>Sediment laden runoff is prevented entering water course</td>
<td></td>
</tr>
<tr>
<td>41.</td>
<td>Water course is kept open and is not blocked by sediment.</td>
<td></td>
</tr>
<tr>
<td>42.</td>
<td>Segregate and store all topsoil and subsoil salvaged from construction areas</td>
<td></td>
</tr>
<tr>
<td>43.</td>
<td>Are non-vegetated areas used for location of construction site/camp and access roads?</td>
<td></td>
</tr>
<tr>
<td>44.</td>
<td>Proper maintenance of re-planted trees and shrubs, protection of existing vegetation and lawns.</td>
<td></td>
</tr>
<tr>
<td>All activities</td>
<td><strong>Construction waste management</strong></td>
<td></td>
</tr>
<tr>
<td>45.</td>
<td>Materials and newly generated construction waste is retained in spoil dumps and temporary accumulation sites agreed with the Consultant.</td>
<td></td>
</tr>
<tr>
<td>46.</td>
<td>Remains of materials and previously detected construction waste is hauled from work site</td>
<td></td>
</tr>
<tr>
<td>47.</td>
<td>Mineral construction and demolition waste are separated from general refuse, organic, liquid and chemical waste by on-site sorting</td>
<td></td>
</tr>
<tr>
<td>48.</td>
<td>Is there any spillage registered? In yes, was the clean-up carried out and the contaminated soil removed immediately?</td>
<td></td>
</tr>
<tr>
<td><strong>Removal of existing cement asbestos roofs, pipes, asphalt pavement</strong></td>
<td>49.</td>
<td>Hazardous waste is managed in accordance with CEMP</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>Earth works, demolition of structures</strong></td>
<td>50.</td>
<td>Non-hazardous waste (excavation material, rocks, concrete and scrap metal, ceramic waste etc.) is managed in accordance with CEMP.</td>
</tr>
<tr>
<td><strong>Dismantling of utilities</strong></td>
<td>51.</td>
<td>Utilities are dismantled and managed in accordance with CEMP</td>
</tr>
<tr>
<td><strong>Use of oil, chemicals, fuel, lubricants, etc. while all activities</strong></td>
<td>52.</td>
<td>Are oil/fuel/lubricant drums and equipment provided with drip trays or located on impermeable surface?</td>
</tr>
<tr>
<td><strong>All activities</strong></td>
<td>53.</td>
<td>Leakages and liquid waste is managed in accordance with CEMP</td>
</tr>
<tr>
<td><strong>All activities</strong></td>
<td>54.</td>
<td>Is there any spillage registered? In yes, was the clean-up carried out and the contaminated soil removed immediately?</td>
</tr>
</tbody>
</table>

**Contractor's facilities and equipment**

| **Proper establishment and organization of the construction site/camp** | 55. | The construction site was properly organized. |
| **Parking of machinery** | 56. | Machinery is parked in approved area |
| **Proper storage of construction materials** | 57. | Construction materials were properly stored. |

**Attachments** (Eg. Photos, Remarks, laboratory reports etc.)

| Pic. 1 | Pic. 2 | Pic. 3 |
Annex 4: OPERATING PLANS

A: WASTE MANAGEMENT PLAN

INTRODUCTION
This is a guideline for the preparation of the Waste Management Plan (WMP). The guideline describes the procedures in order to identify and manage wastes. Wastes include hazardous and non-hazardous wastes and may be solid or liquid wastes. Main impacts will result in the generation of waste from replacement measures at the substations as there are oil, batteries, scrap metals and ceramics. Especially oil and batteries, containing sulfuric acid and lead, could be harmful to the environment. The guideline includes a description of the types of wastes that may arise from construction activities and an outline of the contents for a WMP.

RESPONSIBLE PERSONS

Contractor
The Contractor is represented on-site by the Site Supervisor (SS) who is responsible to the Environmental Manager (EM). The EM is responsible for developing and implementing the WMP procedures. The Contractor is to apply the WMP to the work site and activities. No waste is to be dumped in non-approved sites. The WMP applies equally to the Contractor and Sub-contractors under his control.

Supervising Consultant
The Supervising Consultant is represented by the Resident Engineer (RE). The Environmental Specialist (ES) is the main contact point between the Contractor and the Supervising Consultant. The ES is responsible to the RE. All written communications with the Contractor concerning the CEMP will be via the RE.

APPLICABLE NATIONAL LEGISLATION

- The Minister of Natural Protection, decree on confirmation of consumable waste list and production originating in the territory of RoA (2006).
- The law of the Republic of Armenia on nature protection and nature utilization payments (1998)
- The Law of RA on Waste Management and Sanitary cleaning (2011);
- Decree on confirmation of approval order of waste emerging norms and project of its location limitations (# 2291-N 2005)
- A protocol decision N41 of the Government of RA on approving of guideline on "Management of Polychlorinated biphenyls containing waste"
WASTE PERMITS AND APPROVALS

The necessary permits and approval for disposal and accumulation of various types of wastes will be implemented according to:

- The Law of RA on Waste Management and Sanitary cleaning (2011); (if any)
- Decree on confirmation of approval order of waste emerging norms and project of its location limitations (# 2291-N 2005) (if any)
- Approval of the head of Agarak community for dumping site location dated on 12 August 2016 is attached in the Annex 1 of Agarak-2 CEMP.

CLASSIFICATION AND MANAGEMENT OF WASTES

Waste Categories

Wastes that will be generated from construction activities are categorised under two main headings as follows:

i. Non Hazardous wastes
   a. Site wastes from excavation and demolition activities
   b. Solid waste
   c. Liquid wastes

ii. Hazardous wastes
   d. Dangerous wastes
   e. Hazardous wastes

Management of Wastes

Management of wastes includes the following and these headings are required to be addressed in the WMP for each category of waste.

i. Collection – the WMP will explain how the wastes will be collected.
ii. Storage – the WMP explain how the wastes will be stored
iii. Disposal – the WMP will explain how the wastes will be disposed of.

NON-HAZARDOUS WASTES

Site Wastes from Excavation and Demolition

This includes all material to be removed from the construction site prior to construction commencing and may include waste derived from (i) excavation and (ii) demolition activities at the construction sites.

In the project situation excavation waste may include earth and sub-base materials to achieve vertical and horizontal alignments and asphalt milled from the existing road surface. Additionally this material may also include concrete guide posts and steel guard rails etc.

Following inspection by the EM the waste can be approved for dumping either off-site without any special restrictions or if hazardous waste is present this material is to be dumped according to the requirements for hazardous waste.
Because of their magnitude the dumping of non hazardous excavation wastes are dealt with in detail in section B of Annex 6 - Site Management Plan for Dump Sites.

Quantities of excavation wastes are reported in the monthly report of waste quantities which is attached to the Environmental Management Plan Report (g) detailed in Section 10 of the CEMP Responsibilities for Reporting and Review.

Solid wastes
These are wastes that are generated by the Contractor's activities – this includes the sub-contractors - at site once construction has commenced.

These may include waste off-cuts from metal and timber, concrete, paper, plastics, cardboard, cans and bottles, workshop waste and organic food waste.

The WMP will identify how the Contractor will require the Contractor and sub-contractors to provide sufficient collection containers for collection of solid waste at all construction sites and at all of the work sites and at the Contractor's facilities. Containers will have sufficient capacity to contain the expected waste for the period before they are next emptied. Ideally the containers will be provided with covers. Two sets of containers will be provided and will be identified as follows:

- waste that can be recycled and
- waste that cannot be recycled and will need to be dumped.

Each construction site and Contractor's facility will be provided with separate collection containers for wastes and waste will be sorted at site by the site workers before being placed in the bins.

The WMP is to advise how the Contractor will arrange to sort and collect the waste and advise when the collection will be done e.g. at the end of work each day, every second day etc.. No waste is to allow overflowing onto the surrounding area. Any waste that does or is blown away from the containers will be picked up by the Contractor/sub-contractor. Containers that contain organic waste e.g. food scraps will be emptied at least every two days during the summer to avoid them becoming offensive. Organic waste bins should be placed in plastic bags and sealed before being dumped. Bins are to kept cleaned.

Dangerous Materials and Waste

Dangerous materials and their wastes are materials or wastes that are combustible and are toxic to life forms. Dangerous materials and their wastes include any of the following and will require special procedures for storage, handling and disposal:

- Fuel including petrol and diesel
- Waste oil
- Any waste petrol, diesel and bitumen

The WMP is to state how dangerous materials and wastes will be stored and handled. The minimum requirement is for dangerous wastes to be stored in a special place and separated from combustible materials in a specially prepared facility. The facility will be covered and secured to restrict access to it and contain a waterproof pavement that directs runoff to a safe storage area.

All waste oil will be collected and if possible will be re-used within the construction process or delivered to a waste oil processing facility. Otherwise waste oil is to be collected and disposed of
according to Ministry of Nature Protection (MNP) procedures. The WMP will describe procedures for the disposal of waste oil including all workshop waste which will need to be collected in special containers and transported to approve dump sites.

Fire extinguishers of CO₂ or dry chemical type will be provided in areas where dangerous waste is stored and handled.

**Hazardous Materials and Waste**

Hazardous materials and waste include those that are (i) brought to site as part of the construction process (ii) those that may be encountered during construction e.g. removal and dumping of used asphalt which under Armenian is classified as a Category 4 hazardous material, and (iii) dismantling of old transformers and batteries of electrical substation prior to using these areas for other activities. Old batteries, cement asbestos materials, used oil and old scrap metals like iron/steel/copper are main wastes being potentially hazardous will come up due to the rehabilitation of the substation. Before old transformers of electrical substation are used they are to be inspected by the EM for the presence of any hazardous waste and materials e.g., if necessary. The EM is to advise the RE that the site has been inspected and “No hazardous waste is present” or “hazardous waste has been identified which includes the following materials...”.

Fire extinguishers of CO₂ or dry chemical will be provided where hazardous materials are stored or handled. This is the responsibility of the EM.

A register of hazardous waste will be maintained and will be attached to the Monthly Report prepared by the EM

The WMP will outline procedures for storage, handling and disposal of hazardous wastes.

**DISPOSAL OF WASTES**

Before any site is used for the disposal of wastes it will be approved by the RE. Section B of Annex 4 *Site Management Plan for Dump Sites* will be used to evaluate and approve sites for dumping. No dumping will be allowed in sites without approval from the RE.

The RE is to be advised at least 10 days in advance of the need to open a site for dumping. The RE will arrange for the ES to inspect the site and will report to the RE whether there are any issues with the site. The Contractor will be advised of the decision and if approved the Contractor is to obtain the necessary licences or permits to use the site. Copies of these are to be provided to the RE.

**Disposal of Non-hazardous wastes**

Non-hazardous wastes can be disposed of in approved sites subject to the requirements of Section B of Annex 4 *Site Management Plan for Dump*.

**Handling and Disposal of Hazardous Wastes and Materials**

Hazardous wastes will be handled disposed in accordance with RA legislation, norms, International regulations and applicable guidelines approved by Consultant.

**LIQUID WASTES**

This applies to grey water, sanitation and washing water which will be produced from the Contractor's worker camps and facilities. If the camps and facilities are not connected to an existing
reticulated sanitation system the Contractor will have to provide a suitable waste water treatment and disposal facility. This is the responsibility of the EM who is to advise the RE whether or not such a system will be required. Where workshop and vehicle wash down facilities are provided these are to drain to an oil and water separator that is regularly maintained before being allowed to drain to any waterway.

WASTE MINIMIZATION
The Contractor will review the waste generated on site and incorporate waste minimization procedures into the WMP. This will have benefits for the Contractor in terms of reduced waste quantities. This is the responsibility of the EM.

WORKER AWARENESS PROGRAM
The EM will arrange for regular awareness meetings with all staff regarding the need to collect, sort and minimize waste according to the WMP. The EM will arrange for all newly recruited personnel to be inducted to site and be aware of the need to meet the requirements of the WMP. The EM will arrange a training course about hazardous waste management in general and for asbestos and PCB in oil in particular is recommended for the Contractor and HVEN staff.

OUTLINE OF WMP
The WMP is to be constructed as follows:

- Description of wastes and expected quantities of wastes that will be generated from construction site activities for:
  - Solid wastes
  - Liquid wastes
  - Dangerous wastes
  - Hazardous wastes
- Management of Wastes
- Maps showing the presence of chemical, oil, and hazardous waste storage locations, structures and equipments for diversion and containment of spills, and the location of spill-response equipments (if any)

a. Solid Wastes
   i. Description of wastes and expected quantities of wastes that will be generated from construction site activities
   ii. Approvals and permits required (if needed)
   iii. Collection
   iv. Storage
   v. Disposal
   vi. Opportunities to recycle and minimise waste

b. Liquid Wastes
   i. Description of wastes and expected quantities of wastes that will be generated from construction site activities
   ii. Approvals and permits required (if needed)
   iii. Collection
iv. Storage
v. Disposal
vi. Opportunities to recycle and minimise waste

c. Dangerous Wastes
   i. Description of wastes and expected quantities of wastes that will be generated from
      construction site activities
   ii. Approvals and permits required (if needed)
   iii. Collection
   iv. Storage
   v. Collection
   vi. Opportunities to recycle and minimise waste

d. Hazardous Wastes
   i. Description of wastes and expected quantities of wastes that will be generated from
      construction site activities
   ii. Approvals and permits required (if needed)
   iii. Collection
   iv. Storage
   v. Disposal
   vi. Opportunities to recycle and minimise waste

The WMP should be described
1. Procedures to respond to spills of oil and hazardous materials
2. The clear identification of potential spill sources and the measures put in place to control them
3. Information about the presence of spill-response equipment throughout the construction site
4. Define the roles and responsibilities of the staff involved in responding to spills
5. Clearly define immediate actions to be undertaken to face spills;
6. Discuss the measures of containment, cleanup, and disposal of contaminated materials and soil
7. Clearly describe notification requirements for both internal spill-response teams and outside
   emergency staff, and provide contact information for these persons along with local
   emergency agencies

OTHER SUPPORTING PROCEDURES

The following supporting procedures will also apply to the Waste Management Plan.

- **Emergency Response Plan (ERP)**. In case of any accidents or spillage of dangerous or hazardous
  materials the procedures contained within the ERP will be immediately actioned. A copy of
  the ERP and the list of emergency contact numbers are to be posted in a highly visible site
  within the work area. The EM will be responsible for ensuring that a copy of the ECRP is
  available at the work site.

- **Site-Specific Management Plan** for the approval and management of dump sites and closing
  these areas.

RECORD OF GENERATED WASTES

As part of the WMP the Contractor will maintain a register with information about the
collection and disposal of waste. A copy of the monthly movement of waste will be attached to
the Monthly Environmental Report to be submitted to the RE. A suggested outline for the record is shown.

Waste registration month .................. Year................

<table>
<thead>
<tr>
<th>Type of waste</th>
<th>Removed waste (m$^2$)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Previous month</td>
<td>Current month</td>
</tr>
</tbody>
</table>
GUIDELINES FOR HANDLING NON-FRIABLE ASBESTOS-CONTAINING WASTE

1. GENERAL GUIDELINES AND SCOPE OF WORK

1.1 Introduction

These guidelines provide the background on handling asbestos-containing waste that may be found during rehabilitation of the proposed Agarak-2 substations. This document covers training of workers, site assessment and identification of asbestos-containing waste, handling, pretreatment and disposal of asbestos-containing material (ACM). These guidelines are applicable to Contractor personnel and any other who are at the work site and may contact with ACM.

Procedures presented within this document apply to situations where asbestos containing material (ACM) will be removed or otherwise handled is such a way that it will become disturbed. Where ACMs are identified the Contractor shall consider the following:

- Prior to commencement of work in a building that is identified as having ACM by the Consultant, the contractor shall consult with IA and/or Consultant. The purpose of this shall be to verify the extent (if any) that ACM will be disturbed.
- The amount of ACM that may be disturbed could impact the applicability of this document. If the planned work will disturb less than one square meter (1 m²) of ACM, the Contractor will not be required to use special handling procedures. However, even if only small amounts of asbestos are present, reasonable precautions should be taken including the use of worker PPE, wetting to limit dust generation, and bagging the materials.

This document is intended to provide guidance and practices to be used for the removal of asbestos containing material (ACM) as identified by Consultant or the Contractor’s Environmental & Social and Health & Safety (E&S and H&S) manager. The procedures presented are not intended to meet specific regulatory requirements but rather are intended to meet the intent of best work and management practices. This is accomplished by achieving two project goals accordingly:

- Protection of workers – This includes proper training, use of personal protective equipment (PPE) and specialized work practices to prevent workers performing ACM removal from being exposed to asbestos.
- Protection of future occupants – It is the intent of the abatement to remove both visual and microscopic asbestos from the subject work areas in a manner that will not result in residual fibers which could lead to exposure of occupants upon re-occupancy of the building.

The following constitutes a general guideline and the items listed are specific to the ACM-related activities. In addition to the items in these Guidelines, the Contractor is expected to abide by all related local laws, rules, and regulations in the Republic of Armenia.

This document provides guidance and technical information for the removal of ACM that is non-friable and this guidance applies only to work performed outside of buildings. For the purpose of this report, the term “friable” means that ACM can be crumbled or pulverized by hand pressure. Furthermore, if material that is non-friable in its present condition but is likely to become friable during removal then it is to be considered as friable in so far as following appropriate procedures and the contractor may need to implement additional procedures.
1.2 Preparation / Removal

- Contractor shall provide site security during the hours when Supervisor, workers, and all subcontractors (i.e. demolition and disposal personnel) are on site, and at all times when access to removed ACMs is not otherwise restricted.
- During ACM removal works, from preparation to final clearance, access to the associated work areas and buildings should be strictly prohibited. Only persons duly authorized by the Contractor shall be permitted in buildings and areas where ACM removal works are performed.
- Furniture will be removed prior to commencement of ACM removal activities. Machinery or furniture that must remain shall be covered with polyethylene sheeting (poly).
- ACM debris shall be immediately wetted with amended water and bagged in adequate poly bags, and shall not be permitted to accumulate on the ground. Amended water is defined as water with a chemical surfactant added to it in order to increase the ability of it to penetrate and wet asbestos fibers. In the event that a commercial product specifically intended for this use is not available, the contractor may add a liquid detergent (such as dish soap) to water at a ratio of approximately 1 part soap to 200 parts water. Care should be taken to not add too much soap as this could create a slip hazard on the work site.

1.3 Worker Protection

The purpose of this section is to describe procedures to be followed to prevent exposure of workers of the Contractor to asbestos fibers. This is achieved through a combination of training, equipment and procedures. The material described in this section is applicable to removal of non-friable material.

While engaged in ACM removal activities workers shall be prohibited from smoking. Smoking exacerbates ACM-related health issues and shall be strongly discouraged on the work site. Employees shall be advised of the extreme health risks of smoking on the work site—especially when ACM-related activities are underway.

1.3.1 Training

Workers of the Contractor performing removal of asbestos shall undergo on-site training by a competent person (e.g., Contractor’s Environmental & Social and Health & Safety manager).

The training shall include both lecture and hands on demonstrations. The training shall cover at a minimum:

- Identifying Asbestos
- Materials that contain asbestos
- Friables and Non-friables
- Types of asbestos
- Health effects
- Lung cancer, asbestosis, mesothelioma
- Personal Protective Equipment (PPE)
- Respiratory protection
1.3.2 Equipment

The use of personal protective equipment (PPE) is a critical element to preventing exposure to asbestos fibers while it is being removed. Furthermore, the use of amended water and High-Efficiency Particulate Air (HEPA) equipped vacuums will greatly reduce the chance of fibers becoming airborne. The following list and descriptions of equipment shall be used while removing asbestos. In the event that the equipment specified is not available, the Contractor shall immediately consult with the designated representative of Consultant so that an appropriate alternative can be developed. PPE will be provided by the Contractor. The use of PPE shall be followed by the Contractor regardless of the state (friable or non-friable) or condition of the ACM.

- Respirators – Half-face negative pressure air purifying respirators with a P-100 cartridge or equivalent shall be used. The types of respirators and their use shall be in accordance with current manufacturer’s specifications as well as international occupational safety and health regulations.
- Designated or Disposable Clothing – Workers handling ACM shall either use disposable work suits or shall use clothing that is designated only to be worn inside the work area.
- HEPA vacuum – The works contractor shall make use of HEPA equipped vacuums to remove loose ACM-containing construction dust and debris. In the event that a HEPA equipped vacuum is not available, the works contractor may make use of damp cloths to wipe down surfaces. UNDER NO CONDITION IS DRY SWEEPING ALLOWED WITHIN A WORK AREA.

2. ABATEMENT OF NON-FRIABLE ACM

2.1 General procedures

The following general procedures shall be used at all times when removing or handling ACM:

- Preparation of amended water – The Contractor shall use a water tank of sufficient volume to mix liquid soap with water at a ratio of 1:200 (soap-to-water) and adequately agitate it.
- Use of amended water – ACM shall be kept damp (but not saturated) by spraying of amended water on ACMs during the remediation procedure. Fibers that are damp are less likely to become airborne than those that are dry.
- Proper disposal – ACM shall not be allowed to accumulate on the floor of the work area. Damp ACM shall be placed directly into appropriate disposal bags.
Prohibition of dry sweeping – the use of dry sweeping will cause fibers to become airborne and migrate throughout the building. Under no conditions is dry sweeping to be allowed. The use of HEPA vacuums and/or damp cloth wiping shall be used.

2.1.2 Work Place Isolation
If working inside of closed area, the preparation of the work area for the removal of the non-friable ACM shall consist of the following:

- Critical barriers consisting of a single layer of 6 mil poly where potential breakages may occur (i.e. vents or openings to the building such as windows, doors, vents, roof fan vents).
- One layer of 6 mil polyethylene sheeting shall be the minimum protection on walls or other surfaces that would be difficult to clean near areas where ACM are expected to be cut, broken into pieces, and otherwise produce potentially harmful dust or particles.

2.1.3 Work Procedures
ACM shall be removed in a manner that will not result in breakage or abrasion. ACM shall be kept damp with amended water and shall not be subject to impacts by power tools. In the event that nails or screws need to be removed in order to remove the ACM, the area of the fastener shall be sprayed with amended water, and a HEPA vacuum if available shall be used while the fastener is being removed. The following methods are anticipated to be sufficient to complete this project:

- Removal of ACM panels intact – Panels that are held in place with clips or by gravity shall be removed intact and placed directly into disposal bags or wrapped in plastic.
- Removal of screwed in panels – Panels held on by screws shall be removed by wetting the screw heads with amended water and backing out the screw. Following the removal of the screw, the hole shall be damp cloth cleaned using amended water.
- Removal of riveted panels – Panels held on by rivets shall be removed by use of a hand tool to break the rivet, and if absolutely necessary, the panel itself. The use of amended water is imperative so as to reduce the generation of asbestos fibers. The contractor shall perform this in a manner to minimize the amount of breakage of the panels. In addition, if the blind side of the rivet can be accessed, it may be possible to drill out the rivets without touching the asbestos panel or tile. For example, if the rivet passed through an asbestos panel and a metal support, the expanded end of the rivet could be removed from beneath the metal support by drilling out the end of the rivet. If the size of the drill bit is larger than the diameter of the body of the rivet, there is little danger that the drill bit would pass through the metal support.

ACM removed, including clothes and other disposable materials used in a removal process, shall be placed directly into 6-mil poly bags and these bags shall be handled accordingly:

- Tightly seal the bag or wrap so as to create an air tight seal.
- Wipe down the outside of the bag or wrap using a cloth and amended water.
- Remove the bag from the work area and place in a designated storage location.
- Under no circumstance shall ACM be allowed to accumulate on the work area floor or be allowed to dry out.
2.1.4 Decontamination
The contractor shall provide wash facilities either connected to the work area or within close proximity. The facilities shall include an area where workers can change out of their PPE, thoroughly wash head to toe and then change into either street clothes or clean work clothes. Bags of waste ACM shall be cleaned using damp cloth and HEPA vacuum if available and placed into a second bag prior to leaving the work area. Disposal of non-friable ACM will be in accordance with section 2.1.5 of this document.

2.1.5 Disposal
Bags of waste ACM as well as waste PPE or other materials that were located within the work area shall be stored in a manner that will prevent rupture of bags. Permanent onsite disposal of ACM discovered or disturbed during construction is considered to be an acceptable practice. ACM shall be disposed of in the following manner which will prevent or otherwise reduce the chance of future disturbance.

- Encasement with concrete or asphalt-concrete mixture in a manner that will prevent the future disturbance of waste. Concrete encasement shall be buried at least 1 meter underground and covered with soil.
- The concrete encasements should be marked with a permanent, weatherproof warning sign that may be buried on or embedded in the top of the concrete (e.g., stamped, non-corrodible sheet metal, perhaps covered in plastic). The intent is to make anyone who excavates the concrete at some future time aware that the concrete contains asbestos material so that the concrete is not pulverized during removal. Ideally, each concrete capsule would be of a size that facilitates future removal (e.g., 1 meter cubes). In addition, the inclusion of lifting hooks embedded in the concrete would greatly facilitate any future removal.
- Amended water will be sprayed on in quantities to avoid the creation of standing water or other wastewater
B: SITE MANAGEMENT PLANS FOR DUMP SITES

PURPOSE
This guideline establishes the procedure to prepare a Site Management Plan (SMP) which establishes how to open, operate and close the dump site as well as allocating responsibilities for its implementation.

RESPONSIBLE PERSONS

Contractor
The Contractor is represented on-site by the Site Engineer (SE) who is responsible to the Environmental Manager (EM). The EM is responsible for implementing the following procedures in this annex.

Supervising Consultant
The Supervising Consultant is represented by the Resident Engineer (RE). The Environmental Specialist (ES) is the main contact point between the Contractor and the Supervising Consultant. The ES is responsible to the RE. All written communications with the Contractor concerning the CEMP will be via the RE.

APPLICABLE LEGISLATION AND REGULATIONS
Dump sites are regulated under the following legislation and regulations:
- RA Law on Wastes (2004),
- RA Law on Flora (1999),
- RA Code on Underground Resources (2002),
- RA Law on Atmosphere air protection (1994),
- RA Land Code (2001),
- RA Water Code (2004),

APPROVALS REQUIRED
Clarify the approval process as applied to private land, community and government land and modify the following statements.
Dump sites: permission is to be obtained from the Head of the Community where the dump site is to be located, also permission from other state authorities if it necessary.
If a permit of the Ministry of Nature Protection is needed, it will be obtained and a copy of the permit will be attached to the SMP.
All approvals, permits etc. are to be attached to the SMP.

PROCEDURE FOR OPENING DUMP SITES
i. Site selection. Once the site has been selected the EM is to advise the RE of the site. The RE will arrange for the site to be evaluated with regard to any possible environmental, social and archaeological issues. The EM should allow 10 working days for the site to be evaluated by the RE.
ii. Following the successful evaluation of the site the RE will inform the EM that the site is approved and to prepare a Site Management Plan (SMP) for the or dump.

iii. The SMP will establish the amount of material to be removed or deposited from the site, the size of the site, any infrastructure or utilities that will need to be removed. Machinery to be used and number of workers employed at the site. An assessment of impact is required in terms of noise, dust, vibration and worker safety issues. The MP is to define how the site will be closed and the site rehabilitated.

OUTLINE OF DUMPING SITE MANAGEMENT PLAN

1. Heading – name of site and location – village and Marz.
2. Introduction
3. Date of visit, who was there, purpose of visit – to evaluate dump site.
4. Site Description
   i. Show area of land to be occupied.
   ii. Status of the land – whether private, community or government owned land etc..
   iii. Drainage system – describe the site's drainage.
   iv. Presence of any infrastructure and utilities – show location and distance from site. Show if any of these will require to be removed.
   v. Photos of site and Google image of site with details.
5. Site Development, Operation and Management
   i. Show quantity to be removed or if a dump site the quantity to be brought into the site in m³.
6. Development of site – show the sequence of events to develop the site.
   i. Site preparation requirements.
   ii. Removal of material (m³), depth (m), area (m²).
   iii. Provide a table showing quantities removed or dumped on site, depth and area so that a final assessment of the status of the area can be determined with regard to whether there has been an overall loss or gain of material and how this affects the site.
7. Closure of site – describe how the site will be closed, infrastructure restored and the site rehabilitated.
8. Approvals
   i. List all approvals for operating the site and transport of materials on community roads.
   ii. Approval of the SMP from Contractor's SE.

WORKER AWARENESS PROGRAM

Before commencing work the EM will arrange for all workers will be advised of any environmental and safety issues that have been determined by the SMP.

The EM will arrange for all newly recruited personnel to be inducted to site and be aware of the need to meet the requirements of the SMP.

OTHER SUPPORTING PROCEDURES

The following supporting procedures will also apply to the Management Plan.

- Emergency Response Plan (ERP). In case of any accidents or spill of dangerous or hazardous materials the procedures contained within the ERP will be immediately actioned. A copy of the ERP and the list of emergency contact numbers are to be posted in a highly visible site within the work area. This is the responsibility of the EM.
C: EMERGENCY RESPONSE PLAN

PURPOSE
The Emergency Plan outlines the systems which are in place to enable all of us to respond in as calm and professional a manner as possible to take positive action quickly to mitigate the effects of any incident. All emergencies are different and they can serve as a test of an organization and the skill and expertise of its staff. The most important thing is to be prepared to respond quickly to restore order and normality, learn from the experience and instill confidence both our workers and amongst workers of subcontractors. To enable us to do this we need a clear and concise plan to help us deal with any emergency that may arise. These documents set out to do just that. The key to success is a coordinated and integrated response to an emergency which is why it is essential that all of us read this plan carefully, familiarize ourselves with its contents and recognize our own roles as part of the team responding to the incident.

EMERGENCY PLANNING AND PREPAREDNESS
An emergency is defined as: any contingency that cannot be dominated by the immediate action of the person detecting it and may cause a critical situation whose control calls for means superior to those available at the event location. In some cases, they may be accompanied by catastrophic situations, thus exacerbating the risk that might endanger the integrity of the facilities and the people inside, calling for swift evacuation when the risks far outweigh the means available.

Emergencies can be classified by the origin as:
- NATURAL: earthquakes, hurricanes and flooding.
- TECHNICAL: fire, explosions.
- SOCIAL: intrusion, sabotage, bomb threat.

According to seriousness, they can be classified as:
- MINOR EMERGENCY OR PRE-ALERT: an accident that can be controlled simply and quickly by the personnel and local protection resources, dependency or sector.
- PARTIAL EMERGENCY OR ALERT: control of the emergency requires the intervention of the special on-site emergency team. The effects will be limited to one sector.
- GENERAL EMERGENCY OR ALARM: control of the emergency calls for the action of all the normal on-site protection equipment/teams and assistance from help and rescue resources.
- EVACUATION: the alarm situation involves the evacuation of people from certain sectors.

Procedures to clearly define the action to be taken in the event of an emergency or potential emergency shall be draw up as per the sire requirement. The emergency procedures shall be regularly reviewed and updated. All visitors arriving on site shall be instructed on the emergency arrangements prior to being allowed on site. Practice drills for identified emergency situations, including rescue operations shall be undertaken. Foreseeable emergencies would include, but not necessarily be limited to Fire, Accident, Gas release, Natural calamities, Security alerts. In order to ensure an adequate response to emergency situations it shall be ensured that an adequate number of suitably trained personnel are appointed who are competent in the use of firefighting equipment and provision of first aid. Each site office shall produce and implement suitable fire safety plans which shall detail the actions to be taken on discovering fire, as well as the duties of fire wardens, evacuations procedures and roll calls. On the given guidelines, site emergency plan can be prepared as per site requirement.
The purpose of analyzing possible emergency situations is to determine the organization of the people who might be affected by the same, indicating which means of protection are needed. The aim pursued is to be able to respond swiftly, in coordination and effectively to reduce both human and material consequences arising from each emergency situation. The basic objectives are as follows:

- Combat the accident in its initial phase
- Organize the evacuation of people and goods
- Provide first aid to any possible victims
- Notify outside services about the cause of emergency for their intervention
- Cooperate with the Official Organisms and Public Services
- Re-establish normality once the situation is controlled
- Coordinate all services

In order to ensure an adequate response to emergency situations it shall be ensured that an adequate number of suitably trained personnel are appointed who are competent in the use of firefighting equipment and provision of first aid. Each site office shall produce and implement suitable fire safety plans which shall detail the actions to be taken on discovering fire, as well as the duties of fire wardens, evacuations procedures and roll calls. On the given guidelines, site emergency plan can be prepared as per site requirement. Detailed action plan as below shall be followed in an event of emergency.

INCIDENT OCCURS

Responsible on scene will immediately notify Safety and Healthy manager or Safety officer all information of accident / incident

Responsible on scene will immediately determine if required:

a. First Aid to injured

b. Transport the patient to dispensary (call 03) Responsible will stop all works in the area of the accident and ensure that it is safe to administer medical assistance. Should the situation require evacuating the area, all employees will meet at a safe area determined by the Responsible on scene. The foremen will conduct a head count and report to their Responsible if any are missing.

b.1) Project Manager will notify the Resident Engineer

c. Safety and Project Manager or Safety officer investigate accident / incident

Fire Emergency

Basic fire prevention rules

- All fires are to be reported immediately.
- Maintain order and cleaning
- Before using an open flame, make certain proper fire extinguishers are in the immediate area.
- Know the location of fire extinguishers in your area and know how to use them.
- Make sure that all matches and smoking materials are completely extinguished before they are discarded.
- Smoking is forbidden when fueling equipment.
- All "NO SMOKING" signs are to be obeyed.
- Do not overload electrical power lines.
- Do not manipulate electrical systems improperly or make improvised fuses.
- Do not make any unsuitable electrical connections or adaptations.
- Switch off all electrical apparatuses after use.
- Keep work areas free of combustible materials.
- Covered metal containers shall be used to store oily rags.
- Never use an air hose or pressure to empty drums containing gasoline or flammable liquids.
- Do not refuel a hot or running engine. Clean up spills before starting.
- Do not wear oily or combustible clothing on the job.
- Gasoline is to be used as a motor fuel only.
- Storage containers holding flammable or combustible liquids shall be stored in designated areas specially designed for them and that meet all regulations.
- All fuel cans must be labeled with the contents and the appropriate warnings for that particular product.

The first step when an outbreak of fire is detected is always to give the alarm, either by voice alone or by telephone, alerting the emergency team.

a) Emergency outbreak (easily controllable fire)
In the affected zone, the emergency response team (support teams and fire brigades) will carry out the first intervention for initial control of the emergency:
- First evacuate the area
- Isolate the fire
- Try to put it out using the appropriate extinguisher

The Site Supervisor will be notified or other support if necessary.

Once the fire is out, normal service will be resumed, repairing the damages caused if necessary.

b) General emergency (fire or outbreak out of control)
The emergency teams will confine the fire if possible, trying to prevent it spreading at all times. If water is used to fight the fire, electrical current must be switched off. The Site Supervisor will be warned by default. The Site Supervisor will order application of the Evacuation Plan and call the Firefighting Service and other outside assistance (ambulances, police, etc.) if necessary. Fire fighting service arrival. The Site Supervisor will inform them about the situation and give them the plans of the building or workplace if it is necessary, which must always be available.

c) End of emergency
In the event of a favourable report from the Fire fighting Service, the Site Supervisor will order the re-establishment of activities and draft a report of the event, attempting to take the measures necessary to avoid its recurrence. An archive file of the events must be kept, noting the actions taken and measures adopted.

The procedures for a fire on offices are as follow:
PERSON DISCOVERING A FIRE SHALL (RACE)
R- rescue, if possible without endangering, anyone in immediate danger. NEVER enter an unknown (or unfamiliar) area, especially if smoke is visible.
A- activate the fire alarm system (101) as soon as possible and report the incident
C- confine the fire by closing doors as you leave the building
E- evacuate the building and report the situation to the fire extinguisher and should use an extinguisher only if you have been trained and the situation does not present a personal safety hazard.

FIRE ALARM
FEEL THE DOOR, a “too hot to touch door” means the fire is outside the door IMMEDIATELY EVACUATE the building. Treat all alarms as a real emergency. Always use the exit stairs. Never use an elevator. Close the door as you leave the room.
CRAWL should you get caught in smoke. If necessary, go to the window and signal for help.
ASSIST A PHYSICALLY IMPAIRED PERSON to the closes exit stairwell and advise emergency personnel of this condition.
REPORT anyone causing a false alarm to the emergency responding personnel.
Always:
- Fire extinguishers will be located throughout the jobsite wherever there is a potential fire hazard.
- Responsible on scene will immediately notify Safety and Healthy manager or Safety officer all information of accident / incident
- If a fire cannot be immediately extinguished with a portable fire extinguisher, the Supervisor on scene will immediately call 02.
- All employees shall leave the area until the fire is out, when the emergency equipment has left and the Safety and Healthy Manager or Safety Officer has determined that it is safe to return to the area.
- Safety and Healthy Manager or Safety officer investigate accident / incident
- Project Manager will notify the Resident Engineer
Depending on the type of fuel, the following classes of fire are distinguished:
a) Fires of solid materials whose combustion takes place with formation of live embers.
b) Fires of liquid materials or solids which may be converted into liquid state by heat action.
c) Fires of inflammable gases
d) Fires of metals
e) Electrical fires (this type of fire is not currently regulated)

Extinguishing agents

<table>
<thead>
<tr>
<th>WATER</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acts by</strong></td>
</tr>
<tr>
<td>Cooling: great cooling capacity</td>
</tr>
<tr>
<td>Suffocation: water evaporation</td>
</tr>
<tr>
<td>gives rise to a momentary displacement of circulating air</td>
</tr>
<tr>
<td>Sometimes used to dilute certain water soluble inflammable liquids</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
Extinguishing by water jet is good for class A fires and not acceptable for class B, C and D fires. The extinguishing agent by water spray is excellent for class A fires, acceptable for class B fires and not acceptable for class C and D.

<table>
<thead>
<tr>
<th>PHYSICAL FOAM</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acts by</strong></td>
</tr>
<tr>
<td>Cooling: Being water based</td>
</tr>
<tr>
<td>Suffocation: By impeding air supply</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Physical foam is good for class A and B fires, but not acceptable for class C and D.

<table>
<thead>
<tr>
<th>DRY POWDER</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acts by</strong></td>
</tr>
<tr>
<td>Suffocation: By coming between the fuel and the oxidizing agent</td>
</tr>
<tr>
<td>Inhibition: Neutralizing the free radicals that cause the chain reaction</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

This extinguishing agent is excellent for class B fires and good for class C. Not acceptable for class A and D fires.

<table>
<thead>
<tr>
<th>MULTIPURPOSE POWDER</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acts by</strong></td>
</tr>
<tr>
<td>Cooling: Since during the process a small amount of water is generated. Suffocation: By coming between the fuel and the oxidizing agent Inhibition: Neutralizing free radicals responsible for chain reaction.</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

This extinguishing agent is excellent for class B fires and good for class C. Not acceptable for class A and D fires.

<table>
<thead>
<tr>
<th>CARBON DIOXIDE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acts by</strong></td>
</tr>
<tr>
<td>Cooling: Due to absorption of calories Suffocation: By air displacement</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

This extinguishing agent is acceptable for class A and B fires and not acceptable for classes C and D.

<table>
<thead>
<tr>
<th>HALONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Currently, and as of 1st January 1994, according to the Montreal Protocol (1987) and the Copenhagen Agreement (1992), their manufacture and distribution is prohibited. Their use was allowed until 2000, given the negative effect they have on environmental conditions (ozone layer destruction, greenhouse effect)</strong></td>
</tr>
</tbody>
</table>

**Fire extinguishers**

Equipment enabling is to project and direct an extinguishing agent onto a fire. Depending on the pressurisation system, extinguishers are divided into permanently pressurised extinguishers and extinguishers that are pressurised at point of use. Permanently pressurised extinguishers - this group includes those where the extinguishing agent is gaseous and which provide their own impulsion pressure, such as extinguishers with CO2 and solid, liquid or gaseous extinguishing agents whose impulse pressure is achieved by adding gas. The latter type must be fitted with a pressure gauge.
Extinguishers whose pressurisation takes place at the moment of use. This group includes those extinguishers whose gas propellant is in a small auxiliary bottle.

WORK INSTRUCTIONS FOR USING EXTINGUISHERS

<table>
<thead>
<tr>
<th>WORK INSTRUCTIONS</th>
<th>IT - SST - 01</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OPERATION</strong></td>
<td><strong>HEAD</strong></td>
</tr>
<tr>
<td>Date: 10 / 12 / 2008</td>
<td>Appendices: 0</td>
</tr>
</tbody>
</table>

1.- **START OF ACTIVITY**
- On detecting fire, begin to extinguish it by using extinguishers.
- Evacuate staff that is not necessary in the area.

2.- **WORK FLOW**
- Once the extinguisher has been located, check it is suitable for the type of fire to be fought. Extinguishers located on the premises are appropriate for the type of fire that may appear in each area.
- Check that the pressure gauge needle is in the green zone that indicates its pressure is normal.
- Remove the safety pin by pulling it out, breaking the safety seal. If the safety seal is broken, do not use the extinguisher and look for another identical one.
- Press the trigger and spray a small amount to check it works.
- Approach the area of fire.
- Aim the extinguisher at the foot of the flame. Do not spray over the upper part of the flame.
- For outdoor fires:
  - Use downwind.
- For indoor fires:
  - Use in the natural direction of air, leaving an escape route behind you.
- For liquid fires:
  - Aim the spray at the foot of the flames, sweeping slowly to put out the surface in flames.
  - Avoid burning liquid being blown about.

3.- **END OF ACTIVITY**
- The worker is responsible for the rational use of the extinguisher and must immediately report this use to their direct superior, and the latter to the Workplace Risk Prevention Manager.
- The used extinguisher must immediately be replaced.

4.- **RELEVANT ASPECTS**
4.1. **ENVIRONMENT**
- Ensure the maintenance and check-up calendar is complied with.

4.2. **RISK PREVENTION AT WORK**
PERSONAL PROTECTION EQUIPMENT:
No specific personal protection equipment is necessary to use extinguishers.

EMERGENCY EVACUATION

In case of an emergency, Responsible on scene shall notify all employees.
- The Responsible on scene shall decide whether an evacuation is necessary and shall direct the activation of alarm signal accordingly.
- Responsible on scene will immediately notify Safety and Healthy manager or Safety officer all information of accident / incident.
- Area in-charge shall direct all employees to assemble in the nearest a designated assembly point.
- All equipment shall be switched off.
- Where a work group does not have a dedicated assembly point the area in-charge shall decide the place where to assemble during time of emergency.
- Roll call of the employees shall be taken and status to be reported to the are in-charge.

Written emergency procedures giving details of nearest hospital, fire service telephone, police telephone, shall be displayed in prominent locations.
- Information about the assembly point.
- Instructions about using fire extinguishers.

CHSM
Evacuation types

1- General

- Total evacuation of the workplace or work installations is needed
- Objective: The area affected must be evacuated before the arrival of the assistance Service from the outside.

2- Non-urgent

- The risk situation allows enough time to previously warm of the preparation, and if it is possible, to protect the goods at the workplace
- Later, the evacuation order will be given or the order to restore the services if the risk situation is over

3- Urgent

- Total evacuation of the centre or work installations is needed
- Objective: Wait until instructions of assistance services from the outside.

1) Prior decisions and preparations: The Emergency Manager or deputy assumes the responsibility to totally or partially evacuate the works area. The extent of the evacuation will be determined as well as the urgency and establishment of minimum services if needed. Notify the nearest Emergency services.

2) Evacuating area: The Responsible notifies the workers in the affected area about evacuation. They make a sweep of the area, checking that nobody is left behind. In case on fire, if the situation allows, switch off the general electricity supply.

3) Meeting point: Staff will go to an area outside the facilities. This meeting point will be a risk-free zone. The alarm and evacuation team will monitor the workers on the outside and prevent access to the area affected by the emergency until finalised

4) Arrival of Outside Emergency Services: The Responsible will provide information on the situation, and upon arrival the Emergency Service will assume control and necessary actions to control the emergency. The evacuated workers will remain at the disposal of the Outside Emergency Services

5) Emergency over: Pending a favourable report from the external Help Service, the Responsible orders the services restarted when it is indicated that the dangerous situation has passed, adopting the measures necessary to avoid its repetition.

Once the emergency situation is over, the first intervention team or the Responsible will remove the used extinguishers to be loaded immediately and open an archive file on the events that have occurred, actions taken and measures adopted.
FIRST AID MEDICAL CARE

Every injury shall be reported and treated. The first aid kit should contain approved supplies in a weatherproof container with individual sealed packages for each type of item. It should also include rubber gloves to prevent the transfer of infectious diseases. Provisions should also be made to provide for quick drenching or flushing of the eyes should any person be working around corrosive materials. There are portable medicine kits in the different workplaces, which must contain the material specified in the General Decree on Workplace Safety and Hygiene. There must be a sufficiently visible site to include a list with telephone numbers and addresses of the centers assigned for emergencies, ambulances, etc. ensuring fast transport of possible victims to the help centers. All personnel starting work on site must undergo a medical examination prior to starting work, repeated at one year periods. Given the impossibility of having doctors in every workplace or occupational center, it is necessary to train the workers in first aid application techniques, understanding as such the immediate care and attention to be provided to an accident victim to alleviate their suffering, to avoid it worsening and, on many occasions, preventing disabilities and even death.

The main objectives of first aid are to:
- Avoid more injuries than have already occurred
- Save the life of whoever is about to lose it
- Protect wounds against possible infections and complications
- Transport the victim to the place where they can receive medical assistance

The general principles on first aid are:
1- Keep calm and act quickly, without paying attention to the opinion of onlookers
2- Handle the victim gently and carefully
3- Calm the victim, encouraging them, easing their worries
4- Lay the victim on the ground in the same place where the accident has taken place, placing them with the head backwards or leaning to one side
5- Proceed with a general examination to check the effects of the accident (fractures, bleeding, burns, loss of consciousness, etc.) as well as possible hazardous conditions of the place the victim is in.
6- Unless absolutely necessary (dangerous surroundings, electrocution, etc.) the victim should not be removed from where they are until their injury is safely determined and first aid has been provided.
7- The first thing to check is the breathing and any possible haemorrhaging
8- In the event of loss of consciousness, never give the victim anything to drink
9- Make sure the victim does not cool down, covering them with blankets and keeping the atmosphere at a pleasant temperature
10- Notify the nearest doctor, providing them the known details so that they can indicate the measures to adopt until they arrive
11- Transfer the victim, once attended, to the emergency department of the nearest hospital

The first aid norms are indicated below:

<table>
<thead>
<tr>
<th>CONTUSIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
</tr>
<tr>
<td>Caused by blows, falls, etc. Skin is not hurt but the immediate tissues are. Blood vessels are broken, causing</td>
</tr>
<tr>
<td>Description</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>a dark red inflammation which soon transforms into a bruise</td>
</tr>
<tr>
<td><strong>INFECTION</strong></td>
</tr>
<tr>
<td>The result of the development and propagation of harmful germs in a wound, these develop gradually, so the infection may not appear immediately</td>
</tr>
<tr>
<td><strong>TRAUMATIC SHOCK</strong></td>
</tr>
<tr>
<td>When the injuries are serious, the victim may enter state of shock</td>
</tr>
<tr>
<td><strong>HAEMORRHAGES</strong></td>
</tr>
<tr>
<td>Emission of blood outside its normal conduit. Hemorrhages can be internal or external, of arterial origin or venous.</td>
</tr>
<tr>
<td><strong>BURNS</strong></td>
</tr>
<tr>
<td>According to the degree of injury caused in the skin and tissues, burns are classified as first, second and third degree</td>
</tr>
<tr>
<td><strong>DISLOCATIONS</strong></td>
</tr>
<tr>
<td>When one of the ends of a bone that</td>
</tr>
</tbody>
</table>
forms a joint is out of place | joint, joint mobility reduced, the normal axis of the member is displaced, with apparent lengthening or shortening of the joint | limited to immobilizing the affected area and transferring the victim to see a doctor as soon as possible

| FRACTURES |
| --- | --- | --- |
| Description | Symptoms | Treatment |
| Broken bones | Inability to move the fractured member, deformation and bruising of the injured zone, intense pain, sensation that the two fractured bone fragments are rubbing together | The victim must not be allowed to change position or move until after undergoing a careful examination. As a first step after examining the victim, we immobilize the bone fractured bone with wooden or metal plates, which take in the injured area, even the nearest joint. Immobilization will be provisional |

| INJURIES CAUSED BY HEAT (SUNSTROKE) |
| --- | --- | --- |
| Description | Symptoms | Treatment |
| Sunstroke is a sudden disorder caused by prolonged direct exposure to the sun’s rays or high temperatures. It appears suddenly and, if serious, can lead to loss of consciousness | Strong headaches, nauséas and vomiting. The face becomes purple and congested. Painful cramps. The skin becomes dry and does not sweat. Strong and rapid pulse. The pupils dilate. In extreme cases, the victim has fever of 40 degrees or more and may sometimes go into a coma | Place the victim in a cooler place; lay them down with their head raised to reduce blood flow to the brain; loosen any tight clothing; apply cold water compresses to the head, or refresh it with a sponge; rub the victim’s members in the direction of the heart to encourage blood circulation |

| INJURIES CAUSED BY HEAT (EXHAUSTION) |
| --- | --- | --- |
| Description | Symptoms | Treatment |
| Physical collapse caused by the effects of the sun or another heat source. This state can be serious or minor | If the exhaustion is slight, the patient feels abnormal fatigue, suffering nauséas and dizzy spells. When the case is serious, the victim sweats a lot and feels weak; their skin becoming pale and viscous; vomiting and shivering. The pulse is fast and weak, with weak breathing and expansion of the chest. | Lay the patient down with the head low; clean their mouth; administer a salt and water solution (one teaspoonful per glass of water); cover the body and apply hot compresses; rub their extremities; keep them in absolute repose until the doctor arrives |

| INJURIES CAUSED BY COLD (CHILLING) |
| --- | --- | --- |
| Description | Symptoms | Treatment |
| Caused by body exposure to intense cold. People with bad blood circulation or drunk or intoxicated are less resistant to the cold and therefore more exposed to freezing. This may be local if only a small area | Before freezing takes place, the skin is reddened slightly. As it develops, the colour changes to white or yellowish gray. Blisters appear later. Although pain is | Do not rub the frozen area. Do not apply direct heat. Do not touch possible blisters. Cover the affected part with a woolen material but which does not scratch. Take the victim to a sheltered place |
is affected. felt initially, this soon disappears. immediately. Handle the frozen part with great care. The most indicated procedure is to place them in water at 35 or 37 degrees. Once this is done, try to get the patient not to move. If it is necessary to travel, apply a bandage.

### INJURIES CAUSED BY COLD (FREEZING)

<table>
<thead>
<tr>
<th>Description</th>
<th>Symptoms</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>A deep freezing, serious, that may cause death.</td>
<td>General numbing of the body, difficulty in making any movement, vision becomes cloudy, finally being overcome by great tiredness and losing consciousness.</td>
<td>If victim is not breathing, apply artificial respiration. Transport the victim to a sheltered and heated place. Use lukewarm water compresses to warm the frozen part, covering it well. When they come round, give them something warm to drink. If they are slow to react, do not panic. They must see a doctor as soon as possible.</td>
</tr>
</tbody>
</table>

### LOSS OF CONSCIOUSNESS (SERIOUS)

<table>
<thead>
<tr>
<th>Description</th>
<th>Symptoms</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victim has visible head wounds, congested or very pale face; pulse over 120 beats does not reach 45; they have been long time without coming round and no signs of recovery are evident.</td>
<td>Head trauma or wounds; poisoning by gases, braziers, alcohol; asphyxia and electrical accidents, with halted breathing; cerebral congestion; heart attack; epileptic fits and convulsions.</td>
<td>If there is no apparent injury: lay the victim down with the head as low as possible if the face is pale; if the face is congested face, raise the head and shoulders above the rest of the body; loosen the clothing to facilitate breathing; tap the patient in the face with the palm of the hand and rub their chest; keep them at a good temperature; apply artificial respiration if needed; transfer victim to an emergency clinic as quickly as possible. Do not give them anything to drink.</td>
</tr>
</tbody>
</table>

### LOSS OF CONSCIOUSNESS (FAINTING)

<table>
<thead>
<tr>
<th>Description</th>
<th>Symptoms</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fainting frequently occurs in large crowds, mainly on hot days, not only in enclosed premises but also in the open air. This state is a result of a transitory blood flow deficiency.</td>
<td>The victims suffer dizzy spells, profuse sweating and a heavy feeling in the legs, and may lose consciousness.</td>
<td>Place the patient on the ground, face up, with the head as low as possible, in a cool place. Unfasten their clothing and help them recover, fanning them with a fan or piece of cardboard, etc. If they do not come round, notify the doctor.</td>
</tr>
</tbody>
</table>

### ASPHYXIA
<table>
<thead>
<tr>
<th>Description</th>
<th>Symptoms</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occurs due to the difficulty that the organism has in extracting air from</td>
<td>Difficulty in breathing, showing surprise and spasms. Patient tries to</td>
<td>The most important thing is the speed of action. The</td>
</tr>
<tr>
<td>the atmosphere at a given time. Causes: by submersion; hanging throttling;</td>
<td>take deep breaths. Later, breathing stops and consciousness is lost,</td>
<td>assistance to be provided to asphyxiation victims</td>
</tr>
<tr>
<td>compression of the thorax; carbon monoxide poisoning or any other gas;</td>
<td>victim then enters comatose or dying state; subsequently actual death</td>
<td>can be divided into three sections:</td>
</tr>
<tr>
<td>contraction of respiratory muscles (in electrocution); by suffocation, in</td>
<td>occurs</td>
<td>Rescue</td>
</tr>
<tr>
<td>those cases with an obstruction in the respiratory passages.</td>
<td></td>
<td>Artificial respiration</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Blood flow resuscitation</td>
</tr>
</tbody>
</table>

**Rescue**

Remove the victim from environment, acting with caution. Once the victim is rescued, place them in the open air if the weather is good and if not, in a well-ventilated spot. Remove their clothing above the waist, loosening the belt, shoes, etc. to improve blood flow. Try to remove the foreign bodies that prevent breathing, as well as the water there may be in the interior, placing the patient face down. Likewise, clean the mucous areas of the mouth, nose or throat with the fingers wrapped in a gauze or handkerchief. All of the above must be done as quickly as possible. Take the patient’s tongue out, holding the jaw open to free the air flow through the respiratory passages. Then make them smell ammonia, vinegar or salts. Gently rub the face and thorax with alcohol using a damp towel. Next, proceed to apply artificial respiration.

**Artificial Respiration**

There are different methods: removal of obstructions from respiratory tract, Heimlich manoeuvre; mouth to mouth resuscitation; Sylvester method; Schaffer method; Nielsen method.

**BLOOD FLOW RESUSCITATION**

There are different methods: resuscitation by appropriate medicines and cardiac massage:

**Resuscitation by appropriate medicines**

Administration of circulatory and respiratory tonics is indispensable in cases of asphyxia. For states of apparent death, certain tonics such as “cardiazol”, “simpatol” and “coramina” usually resuscitate many accident victims. They must be used intravenously or intracardially, although the latter only in surgical operations. These stimulating tonics must form part of the medicine kit in rescue situations and only be applied by professional personnel.

**Heart massage**

Cardiac massage synchronized with “mouth to mouth” artificial respiration usually has surprising effects, often saving a life that has been given up for lost. To give the massage, place the patient on a level and rigid surface, preferably on a raised plane, such as a table, facing upwards and naked from the waist up. The person providing first aid takes position on one side of the patient, above them, placing the heel of one hand on the breastbone. The heel of the other hand rests on the previous one. Then we push down on the chest, making it go down three or four centimeters. Leave a short interval so that the thoracic wall expands again on its own. The purpose of these movements is to compress the
heart on the breastbone and spinal column. This compression is sufficient to drain the heart of blood. The compression rate will be 60 times a minute. It is important not to become discouraged and to keep applying the procedure for as long as necessary. It is highly recommendable that another person should apply mouth to mouth resuscitation at the same time.

![CPR Diagram]

**ELECTROCUTION**

<table>
<thead>
<tr>
<th>Description</th>
<th>Symptoms</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>May occur due to faults in the electrical system, machinery, by derivations, lack of insulation, improper handling or failing to take the necessary precautions. The accident happens due to contact with a conductor of electricity.</td>
<td>Switch off the current maneuvering in the section or general switches; if it is not possible to act upon the switches, insulate yourself properly (using rubber gloves and shoes or getting onto a wooden platform); if the shock victim is still connected to the electrical conductor, separate them it using an insulating pole; if the injured person is lying on top of the conductor, surround their feet with dry clothing or fabric and pull them by the feet with a wooden stick or pole; cut the electrical conductor on both sides of the victim using an axe fitted with a wooden handle; in high tension, turn off the current on both sides of the victim; if the victim had been suspended at a certain height above ground, anticipated their fall, placing mattresses and blankets, etc. underneath.</td>
<td>Once the victim is rescued, quickly proceed with resuscitation. In general, the patient undergoes a sudden loss of consciousness when receiving the discharge, the pulse is very weak and they will probably suffer burns. The body remains stiff. If they are not breathing, apply artificial respiration quickly and without becoming discouraged. It will usually be necessary to give a cardiac massage, because the shock effect usually paralyses the heart or upsets its rate.</td>
</tr>
</tbody>
</table>
## VICTIM ASSESSMENT

Assessing the importance of the patient’s status is a helpful factor for the medical attention team, notifying everything observed in the assessment upon arrival. We shall check:

1. **Pulse:** take the pulse in the carotid artery, placing two or three fingers to one side of the neck, under the Adam’s apple.

2. **Respiratory tract:**
   - Check inside the mouth to ensure that there are no foreign objects
   - Move the head back so that the tongue does not block the throat; this will facilitate the entry of air.
   - If spinal column injury is suspected, use the procedure of pushing the jaw forwards with both thumbs.

If the victim is not breathing:
   - Bend your head down and put your ear to the victim’s chest.
   - Check the chest for movement.
   - Bring your check close to victim’s face to feel their breath
   - If the victim has a column’s injury, is face down, and you suspect that they are not breathing, it may be necessary to move them to decongest the respiratory tract.

## TRANSPORTING THE VICTIM

Examine the victim and rule out any possible spinal column injuries (check if the members can move, of they have feeling, or any blows to the head). If these symptoms are positive and the patient must be moved or they will be immediate danger, use the drag method, taking hold of the victim’s clothes to take them to a safe place.

Proceed as follows:

**ONE-RESCUER METHODS**

### Human crutch (Picture 1)

This method is only for casualties who can help themselves. It is an easy way to move the less seriously injured.

### Drag carry (Picture 2)

This carry is used to drag a casualty who is either lying on their back or in a sitting position. Ease your hands under the casualty’s shoulders and grasp the clothing on each side, supporting the head between your forearms. Drag the casualty backward only as far as necessary for his/her safety. But be careful; make sure not to choke the casualties when pulling on their clothing.

### Blanket drag (Picture 3)

An alternate method to the drag carries where the rescuer can use a blanket to support and pull the casualty.

### Pick-a-back (Picture 4)

Simply lift the casualty from a standing or sitting position onto your back. Don’t try it if the casualty is unconscious or has arm injuries.

### Removal Downstairs (Picture 5)

Don’t try this if you suspect head or spinal injuries or broken limbs. Use a mattress or rug under the person if one is available.

### Firefighter’s crawl (Picture 6)

Use a triangular bandage, a torn shirt, etc to tie the casualty’s hands together and place them around your neck. This way you can move a person much heavier than yourself.
TWO-RESCUER METHODS
If there are two of you to do the carrying, try one of these emergency methods:

Chair lift (Picture 7)
The chair carry can be used for a conscious or unconscious casualty but not for suspected head/spinal injuries. For protection, secure the casualty's hands across his or her chest and, if the casualty is unconscious, secure the person to the chair.

Two-hand seat carry (Picture 8)
This is another way to carry a conscious casualty who can neither walk nor support the upper body. Make a hook with your fingers by folding them towards your palm and grab onto your partner's "hook". If you don't have any gloves, use a piece of cloth to protect your hand from the other person's nails. This is yet another good reason to wear gloves!

Four-hand seat carry (Picture 9)
This is also a good carry for a conscious casualty who can use hands and arms for support.

MULTI-RESCUER METHODS
If there are more than two of you to do the job, there are a number of different methods that can be used to carry casualties.

Blanket lift (Picture 10)
Don’t use this lift if head/spinal injuries are suspected.
1. Roll the blanket or rug lengthwise for half its width. Position bearers at the head and feet to keep the
head, neck and body in line.
2. Kneel at the casualty’s shoulder and position a bearer at the waist to help logroll the casualty onto the uninjured side. Turn the casualty as a unit so that his/her body is not twisted during the logroll.
3. Roll the casualty back over the blanket roll to lay face up on the blanket. Unroll the blanket and then roll the edges of the blanket to each side of the casualty. Get ready to lift the casualty – have bearers grip the rolls at the head and shoulders, and at the hips and legs.
4. Keep the blanket tight as the casualty is lifted and placed on the stretcher.

THREE-PERSON LIFT AND CARRY
This is an excellent way of lifting a badly hurt person without complicating most injuries. The casualty can be carried forward, sideways or lowered onto a stretcher.

Improvised stretchers
If a commercially prepared stretcher is not available, you can improvise one by using a tabletop, door, two rigid poles and a blanket or clothing. Don’t use non-rigid stretchers for casualties with suspected head or spinal injuries.

Blanket and poles stretcher (Picture 11)
1. Place the blanket flat on the ground and place a pole one-third of the way from the end. Fold the one-third length of the blanket over the pole.
2. Place the second pole parallel to the first so that it is on the doubled part of the blanket, about 15 cm (6 in) from the doubled edge.
3. Fold the remaining blanket over the two poles. The casualty’s weight on the blanket holds the folds in place.

Stretcher from found materials
Doors, short ladders, sheets of galvanized metal, etc can all be used to improvise stretchers. Keep an eye out for suitable materials.
Make sure the stretcher and casualty will clear passageways and that the stretcher is strong enough to hold the casualty.
NOTE: Test an improvised stretcher with someone equal to or heavier than the casualty to ensure that it will hold. Check the clearance of an improvised stretcher to ensure that it will pass through hallways, doors and stairways without harm to the casualty.

Blanketing stretchers (Picture 12)
One blanket can be used to wrap the casualty for warmth and provide easy access to the casualty’s wounds. Place a blanket diagonally on the length of the stretcher. Fold the overhanging edges and tuck them on both sides of the stretcher bed to keep them off the ground.
After the casualty has been placed on the stretcher, bring the bottom corner (1 in the figure) over the feet and tuck between the ankles. The corner at the head (2) is brought around the head and neck towards the chest.
Whenever casualties have to be carried over uneven ground or debris, they should be lashed to the stretcher using clove hitches. A clove hitch on the stretcher handle starts the lashing. This is followed by a series of half hitches positioned around the casualty at mid-chest, at the hip, where the legs join the torso and just below the knee.

Carrying stretchers
A stretcher should be carried by at least four people, normally facing the direction of travel, with the casualty's feet first. They should carry head first if going uphill or upstairs and when loading into an ambulance or onto a bed. Remind rescuers that someone should keep watching the casualty while they are transporting.

Uneven ground and obstacles
When crossing uneven ground, a stretcher should be carried by four people and kept as level as possible. The rescuers must adjust the height of the stretcher to compensate for dips and rises in the terrain. If the ground is unstable, the stretcher should be passed along a row of six to eight people rather than have bearers move over the rubble – especially when set down – since the lashing could tighten around the casualty. If going through a doorway, the front bearers should move to the middle of the stretcher and let the front part protrude through the door. One rescuer at a time moves through the doorway, then re-grasps the stretcher.

Avoid crossing a wall or high obstacle, even if it means a longer carry. Where a wall must be crossed, follow these steps:

1. Lift the stretcher so that the front handles are supported by the wall. The people in the rear hold the stretcher level while the front person crosses the wall.
2. All bearers lift together and move the stretcher forward until the rear handles rest on the wall. The people in the rear then cross the wall.

Medical Intervention for workers
All injuries that require a physician's attention should be reported to the Safety Manager or his designee, as soon as possible.
EMERGENCY MEDICAL AID PROVISION IN CASE OF SNAKE AND SCORPION BITES

Approved by N427 – A order of 17.03.2011 By RA Minister of Health

EMERGENCY MEDICAL AID PROVISION IN CASE OF SNAKE AND SCORPION BITES

CLINICAL SYMPTOMS
Area of viper bites hurts a lot and swells afterwards. The skin reddens where it was bitten, while the swell spreads across the whole extremity (in case of a finger being bitten the swell may spread up to the victim’s shoulder). 20-40 minutes after the bite shock signs emerge- vertigo, nausea, puke, artery (vascular pulse) weakening and acceleration, falling of blood pressure.

FIRST PRE-MEDICAL AID
• Emergency premedical aid is provided in the first circuit (medical assistant – obstetric post; rural outpatient clinic; clinic) where it is possible for the snake bite casualty to come up first.
• Primary emergency medical aid to the casualty of a snake’s bite is as follows;
• Ensure horizontal position and full rest of the injured person. It would be good for the casualty not to move at all. This will slow down the proliferation of the venom within the organism. Casualty shall drink liquids (water, juices, tea, everything except for coffee and alcohol) as much as possible. Liquids help dispose of the venom.
• The injured part of the body (usually the extremity) shall be immobilized, since the venom spreads through lymphatic ways, while motion results in the quick spread of the venom.
• Carry out anti-shock measures, e.g. pain-relief and corticosteroid medication (Analgin 1-2 vials, Dexamethasone or Prednisolone 1-2 ml), as well as cardiac medication (Cordiamin, caffeine 1 -2ml).
Casualty (in a stretcher since he/she shall not walk on his/her own) shall be transported to hospital’s toxicology and/or resuscitation department as soon as possible. In case sanitary transport is missing in the institution, ambulance that serves the given region shall be called. Prior to that, all the aforementioned preventive measures shall be implemented

TOURNIQUET SHALL NOT BE USED TO TIGHTEN THE EXTREMITY, SINCE IT WILL FURTHER WORSEN THE CONDITION OF THE VICTIM.
Incorrect emergency aid in case of a snake’s bite may at times be far more dangerous and harmful than the bite itself. Furthermore, incorrect activities may impede the diagnosis and further treatment.
IT IS STRICTLY FORBIDDEN TO

** MAKE A CUT ON THE BITTEN SPOT
** BURN THE BITTEN SPOT
** USE ALCOHOL AND/OR COFFEE

EMERGENCY AID IN CASE OF A SCORPION’S BITE

Cases of scorpion’s bites have frequently been recorded in Armenia throughout the recent years. Scorpions mainly inhabit in dry and warm areas, in the South flanks of the hills, and often in the Ararat valley.

CLINICAL SYMPTOMS:
Scorpion’s bite hurts strongly, it reddens and bulges (bulging). Heart rhythm becomes faster, body temperature increases, strong headache and nausea occur.

Emergency aid provision: Pain-relief, anti-allergic and hormonal medication shall be injected in case of a scorpion’s bite. The victim shall be transported to hospital in no time. There is no antidote, nonetheless, hospitals provide with rather efficient treatment against a scorpion’s bite. Lethal cases are very few.

Suck the venom out of the bitten spot by means of a vacuum pump, wash out the wound with 1% manganese solution and put cold around the wound.
Casualties are often able to recognize and inform what snake or scorpion they were bitten by, however, in some cases it is not easy to explain. If such cases occur, it is recommended to show the images provided below in order to help decide what approach to take. 23 snake types are widespread in the Armenia, of which only 4 are venomous.

**Vipera darevskii.** This snake is average 50cm long, the tail is 4-5cm long. The snake is of either yellow-chestnut or yellow-grey colour. The body is covered by a dark zigzag strip. Belly is almost black. The snake is widespread only in Ashotsk region. These vipers inhabit beneath flat stone flags where they hibernate later on. The snakes are active from early May till late September. These snakes inhabit in highlands; the likelihood of contact with human beings is very low, cases of bites are quite rare. These snakes are considered to be the least hazardous to human beings (see image).
Mountain-steppe or Armenian steppe viper (*Vipera eriwanensis*): This snake is about 60-70cm long; females are a bit larger than males. The head seems to be sharpened at both sides; the body is of grey colour and the back is covered by a darker or a black zigzag layer which is in some parts divided in the form of longish moles. Body sides are also covered with dark grey, but smaller moles. This viper is mostly spread in Central and North mountain steppes of Armenia and in highland meadows, in particular in the regions of Kotayk, Hrazdan, Aparan, Ashotsk, Akhuryan, Amasia, Spitak, Ararat and Vayq (see the map at the end). These snakes get out of their winter refuge mid April. They are active till July-August. These snakes are considered to be less venomous. Cases of lethal bites were not recorded (see image).
Armenian viper (Vipera raddei). This is one of the largest vipers. It is 80-100cm long (can be up to 1.5m). There are orange or chestnut patterns on the grey-brownish body; the edge of the tail is almost totally of yellow-orange colour; two dark slanting lines can be observed upon the background of the relatively light colour of the head. In Armenia this snake is widespread in the highlands of the regions of Hrazdan, Kotayk, Ararat, Yeghegnadzor, Vayq, Sisian and Kapan. These snakes leave their winter refuge from mid April. The Armenian viper is venomous and very hazardous (see image). “Antigyurzin” shall not be injected in the case of the Armenian viper bite, therefore, the medical personnel, to whom the snake bite victim has turned for help, shall collect detailed anamnesis.
Lebetina viper (*Vipera lebetina*). This is the largest and the most hazardous snake in Armenia (up to 175cm long and in exceptional cases up to 2m long). It has got a ‘flat’ face, thick body that is of grey and/or red-chestnut colour. Dark brown or orange spots can be observed on the back, with smaller spots on the sides. The head is unicolour, with no patterns. Sometimes one may come across absolute unicolour types as well. In Armenia lebetina viper is widespread in the valley of Araks River and its foothills; in the valley of Kur river in the North, and in the regions of Talin, Armavir, Echmiadzin, Baghramyan, Ashtarak, Artashat, Ararat, Masis, Hrazdan, Kotayk, Yeghagnadzor, Vayk, Goris, Sisian, Kapan, Meghri and Noyemberyan. The snake leaves its winter refuge early March. Due to its large size, it envenoms to a considerable extent. That is why, it is considered to be the most hazardous snake not only in Armenia, but in the Caucasus as well. Bite of lebetina viper results in high mortality (see image).
GENERAL INFORMATION ABOUT WIDESPREAD TYPES OF SCORPIONS IN RA

Scorpions mostly inhabit in dry and warm areas- in the South flanks of the hills and often in the Ararat valley.

Two types of scorpions exist in Armenia. The most frequent type is motley scorpion (*Buthus eupeus*).

**Motley scorpion (*Buthus eupeus*)**. The latter has got yellow-brown and dark spots, as well as lines on the back. It is about 4-5 cm long.

**Black scorpion**. As the name suggests, these scorpions are of dark colour and they are larger than the motley ones. These scorpions are very venomous in all the seasons of the year. “They have got neurotoxic venom, which at time is far more dangerous than the venom of a snake.”
HABITATS OF VENOMOUS SNAKES IN ARMENIA

Vipera derевскii
Venomous, but bite is not lethal to human life (Body length is 50cm)

Vipera eriwanensis
Venomous, but bite is not lethal to human life (body length is 60-70cm)

Vipera raddei
Bite is hazardous to human life (body length is 1.15m)

Vipera lebetina
Bite is hazardous to human life
D: COMMUNITY COMMUNICATIONS PLAN

PURPOSE

The purpose of the Community Communications Plan (CCP) is to create a link between the Contractor and the affected communities with regard to consulting and advising them in advance and during operation of the works plan and possible impacts of the construction activities. The Community Communications Plan also includes informing the public about the Grievance Redress Procedure.

RESPONSIBLE PERSONS

CONTRACTOR

The Contractor is represented on-site by the Site Engineer (SE) who is responsible to the Environmental Manager (EM). The EM is responsible for organizing and implementing the Community Communications Plan. The EM will provide with a dedicated telephone number which the communities may use to contact the Contractor during project implementation should there be any construction issues affecting the communities. The community may also directly contact the Contractor's Site Foreman, Site Engineer or other construction Contractor representative who will be in the project site. The Contractor is required to keep a book at site where all community related issues are recorded. The book will be available to PC and IA staff to inspect.

PROJECT IMPLEMENTATION CONSULTANT (PIC)

The international Environmental Specialists (IES) of the PIC are the main contact points between the Contractor and the PIC. While the IES will supervise the program the IES are responsible to the PIC. All written communications with the Contractor concerning the CEMP will be via the PIC, copied to the IES as required.

APPLICABLE LEGISLATION AND REQUIREMENTS

Consultation is a requirement under the Armenian Law on Environmental Impact Assessment and Expertise, 2014, the ADB Safeguard Policy Statement, 2009. Requirements include that there should be: i) Communication with the public to provide information and consultation about the project; ii) priority recruitment of local labour for unskilled jobs in road construction and iii) The Grievance Redress Mechanism (GRM) which is to be implemented by the Contractor will allow affected persons to raise issues concerning the project's construction activities. The Contractor will, when required, participate in the GRM, by providing information on the damage or loss of income or other negative impacts caused during the construction phase.

PROCEDURE FOR COMMUNICATION MEETINGS

The EM will be responsible for making the following arrangements for implementing the CCP.
1. Following approval from the PIC the EM will arrange to notify the Community head for a joint meeting for the Agarak-2 substation construction site. Following that, residents from Agarak community living close to the construction site will be invited to a communication meeting at least one week prior to the meeting to discuss, among other things the substation construction program and the grievance redress procedure.

2. The EM will arrange the venue for the meetings. To be at a convenient time and location for local people to attend.

3. The information and consultation process will include and record the result of separate discussions with women and men.

4. Following the meeting the EM is to prepare a record of the meeting in the following format. The account of the meeting will be included as an Annex in the Monthly Report.

   a. Date and place of meeting
   b. Number of people attending (total women and total men) including a register of names and contact details of key informants, female and male. The name of the person who chaired the meeting together with that person's occupation or role within the community.
   c. Details of the presentation made by the EM which includes presenting details of the construction and operation phases of the road, the social and environmental safeguards and the Grievance Redress Mechanism.
   d. Providing a contact telephone number for the Contractor – to be used by the public
   e. An account of the questions received and the EM response.
   f. Any issues raised by participants which cannot be addressed by the Contractor and need to be forwarded to the PIC or IA.
   g. Date of proposed collection of any written responses from the community.

**PRESENTATION TOPICS:**

All presentation materials, information pamphlets and talks are to be conducted in the Armenian language. The Contractor will provide an English language translator/interpreter when international experts attend public consultation meetings.

During the meetings the following topics are introduced to the public:

1. Opening of session and introduction to CCP presenters by Chairman.
2. The Contractor will present the following talks in Armenian.
   
a. Introduction to the Agarak-2 substation rehabilitation Project;
b. Technical, social and environmental safeguard requirements of the project.
c. Social Safeguards:
   i. Community Communication and Participation program: discussion about social safeguards, prevention of problems during the construction works;
d. Environmental Safeguards
   i. Details of the CEMP to be applied during the construction works. Advise the community of sites which will be used for dumping waste, machinery/equipment storage requirements and traffic management issues.

Common to ES programs

   e. Notify the community of the dedicated phone lines to communicate issues and grievances with the Contractor. The Contractor will provide phone numbers to the PIC and IA if the Contractor cannot resolve any issue.
f. Details of the Grievance Redress Mechanism and lodgement of complaints.
g. The local community will be advised of the numbers of truck movements, the access roads that they will take, safety issues, concerning speed limits imposed on the trucks as they move through urbanized areas, the need to cover dusty loads etc.
h. Questions and answers, general discussion. The result of discussions will be recorded separately, and later translated into English for the monthly reports.
i. Obtain contact details for key informants head of community to be used to arrange follow up meetings and to organise participation.

Close session by Chairman.

COMPLAINTS PROCEDURE

It is requirements of the ADB Safeguards Policy Statement, 2009 that a grievance procedure (Grievance Redress Mechanism) is put in place to address any issues that project affected people may have concerning the environmental management of the project.

The procedure aims to address any complaints, raised during the construction phase first directly with the Contractor and if the Contractor is unable to resolve the issues the issue is then passed to the IA for a decision. All complaints (will be addressed and included in monthly reports of Contractor, PIC and IA) Complaints must be made and dealt with openly and without any fear of retribution to the person making the complaint.

Any person making a complaint is required to follow these steps:

3. The complainant first clears the complaint with the head of the community.
After this the complaint is directed to the Contractor.

If the Contractor cannot resolve the issue the complaint is directed to the PIC.

If the PIC cannot resolve the complaint it is directed to the IA.

The EM's role in the grievance procedure is:

Being the second point of contact.

Keeps a log of grievances in a publicly accessible place at-site as the Complaints Register.

Discusses the grievance with the affected parties and attempts to resolves it. If the Contractor is unable to resolve the issue the grievance is referred to the PIC.

The Contractor includes a statement of all grievances received, those that were satisfactorily addressed and those referred to the PMC. This information is included as a regular item in the Monthly Report.

The EM is to have a dedicated phone number that is shown on a Project Notice Board that will be erected by the Contractor at work site. The notice board will also display an email address and the days and times (once per two weeks) when the EM or his representative will be present on site to meet the public and answer queries.

The EM is responsible for establishing and maintaining this procedure which includes maintaining the Complaints Register which is to be available to the public at the work site. The EM will ensure that complaints are registered and dealt with according to the procedure.

Annex 5: THE CONTRACTOR'S ORGANIZATIONAL FLOWCHARTS
Annex 6: PROJECT SCHEDULE AND MILESTONES
Annex 7: CONTRACTOR'S HSE POLICY