



Powering a Sustainable Future

FRV MASRIK CJSC

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**55 MW PV POWER PLANT IN
MASRIK**

Document Title:

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

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ACRONYMS AND ABBREVIATIONS

- ESMP: Environmental and Social Management Plan
- ESIA: Environmental and Social Impact Assessment
- LRP: Livelihood Restoration Plan
- SEP: Stakeholders Engagement Plan
- ESMS: Environmental and Social Management System
- ESIA: Environmental and Social Impact Assessment
- IFC PS: IFC Performance Standards
- EBRD PS: EBRD Performance Standards
- CSR: Corporate Social Responsibility
- EP III: Equateur Principles (2013)
- PAP: Peoples Affected by the Project
- PIP: properties Impacted by the Project
- WBG: World Bank Group
- HSE: Health, Safety, Environment
- ME: Ministry of Environment
- OTL: Overhead Transmission Line
- SNCO: State Non-commercial Organization
- PAP: Project Affected Person
- PCR: Physical Cultural Resources
- RA: Republic of Armenia
- LSGB: Local Self Governance Body

1 INTRODUCTION

The Republic of Armenia (RA), with the support from the Climate Investment Fund’s Scaling-up Renewable Energy Program in Low Income Countries (SREP) and International Bank for Reconstruction and Development (IBRD), launched in 2017 a bidding process for the implementation of a Utility-Scale Solar Power project located in Mets Masrik, Vardenis sub region of Gegharkunik Marz.

On behalf of the RA, R2E2 Fund (R2E2) has been responsible for the implementation of the bidding process (the implementation agency) and communication with the communities.

Fotowatio Renewable Ventures B.V. and FSL Solar S.L. (the “Developer”), as a consortium, have been awarded to develop, finance, construct and operate the Masrik 1 PV plant the 14th of May 2018 (hereafter referred to as ‘the Project’).

In accordance with the law on environmental impact assessment and expertise adopted in July 2014, the Ministry of Environment (ME) classifies such a Project as “Category B” which requires the preparation of a comprehensive Environmental and Social Impact Assessment (ESIA) before an environmental permit is granted. The ESIA has been prepared and submitted to the ME in February 2019 and an environmental conclusion which include project-specific dispositions has been issued on July 17th, 2019. The Developer will be seeking financing for the Project from prospective lenders, including International Financial Institutions (IFIs) – such as the European Bank for Reconstruction and Development (EBRD) and International Finance Corporation (IFC). Therefore, for the purpose of the ESIA this has also been developed in accordance with EBRD Environmental and Social Policy (2014) and Performance Requirements (PR) and IFC Performance Standards (2012).

1.1 PROJECT DESCRIPTION

The Project is located within Vardenis sub-region of Gegharkunik Marz in Lake Sevan in-shore Masrik valley approximately 170 km East of the capital city of Yerevan. More specifically, the Project site is located within the Masrik District which hosts several and villages; the closest being is Mets Masrik village located at 4.2km to the southeast of the Project site. The Project is accessed by M11-M14 – a road which connects East with West of Armenia (following Lake Sevan shores) with Mets Masrik village. The total Project area is around 13km². The Project area in general is located 7.2 km from Lake Sevan shore which is characterized as being grazing land (used for pastural activities).

Figure 1 below presents the overview of the Project Location while Table 1 presents the Project coordinates.



Figure 1: Overview of Project Location

No.	X Armenian Land register	Y Armenian Land register	No.	X Armenian Land register	Y Armenian Land register
1	8561119.8555	4454460.1224	11	8562664.2855	4455602.5654
2	8560954.3871	4454681.2610	12	8563015.2235	4455289.0294
3	8560904.1609	4454786.2978	13	8563015.2155	4454887.5104
4	8560711.0215	4455190.2052	14	8562548.9398	4454876.5493
5	8560908.6657	4455212.5150	15	8562520.1308	4454850.8569
6	8561402.3295	4455266.6119	16	8562452.1489	4454794.3969
7	8561793.5210	4455181.0899	17	8562466.5590	4454701.7211
8	8562048.5680	4455184.4239	18	8561879.1444	4454712.5803
9	8562210.3797	4455287.5968	19	8561358.0098	4454584.6775
10	8562411.7522	4455375.2692			

Table 1: Project Site Coordinates

The Project will result in crucial positive environmental and economic impacts on the strategic and national level given the current challenges the energy sector in Armenia is facing. Such positive impacts underpin rationale for the Project. These include the following:

- The Project allows for more sustainable development and shows the commitment of the RA to realizing its Energy Strategy for addressing the three principal challenges in its energy sector:
 - i. an emerging supply gap;
 - ii. the need to maintain energy supply reliability;
 - iii. the need to maintain affordable tariffs.

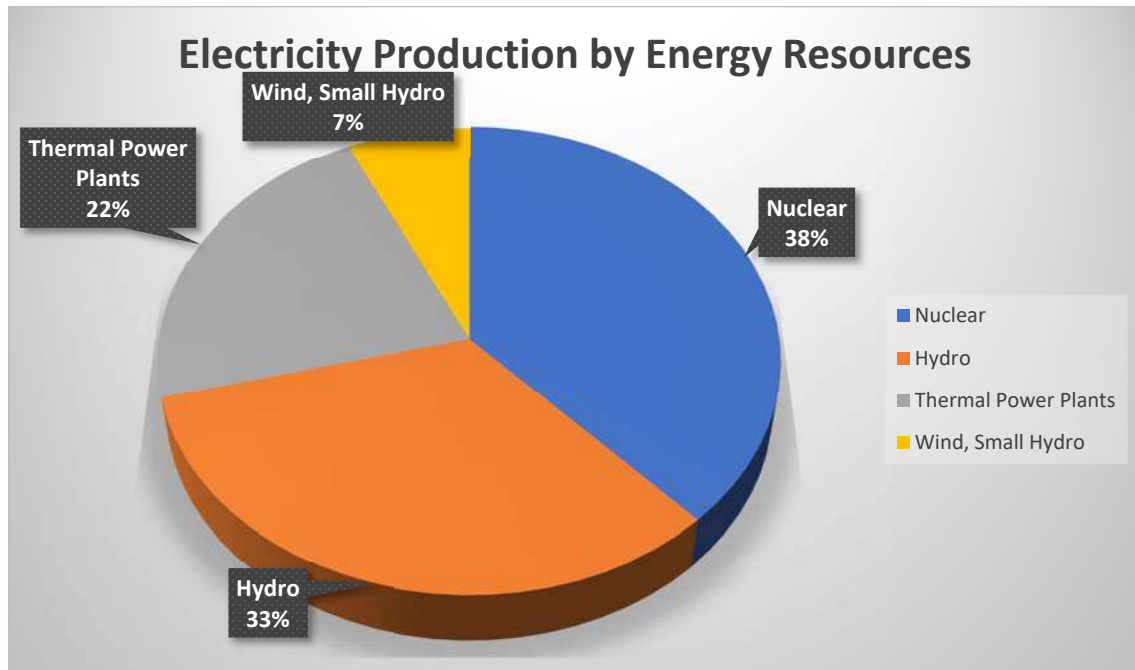


Figure 2: Energy mix in Armenia

- The Project will contribute to increasing energy security through reliance on an indigenous, inexhaustible and mostly import-independent energy resource. The expected electricity generation from the Project will serve the annual electricity needs of more than 25,000 local households;
- The Project will produce clean energy which will contribute to lowering electricity generation costs when compared to the current costs associated with liquid fuels; and
- Generating electricity through PV power is rather pollution-free during operation. Compared with the conventional way of producing electricity in Armenia, the clean energy produced is expected to reduce consumption of liquid fuels for electricity generation and will thus help in reducing greenhouse gas emissions as well as air pollutant emissions.

1.2 PROJECT COMPONENTS

The key components of the Project are the power arrays which are composed of PV panels which convert solar energy (radiation from the sun) into electricity. Throughout the site the total number of PV Panels will be just over 180,000 PV Panels. A typical PV power array that is composed of PV panels is shown in Figure 3 below.



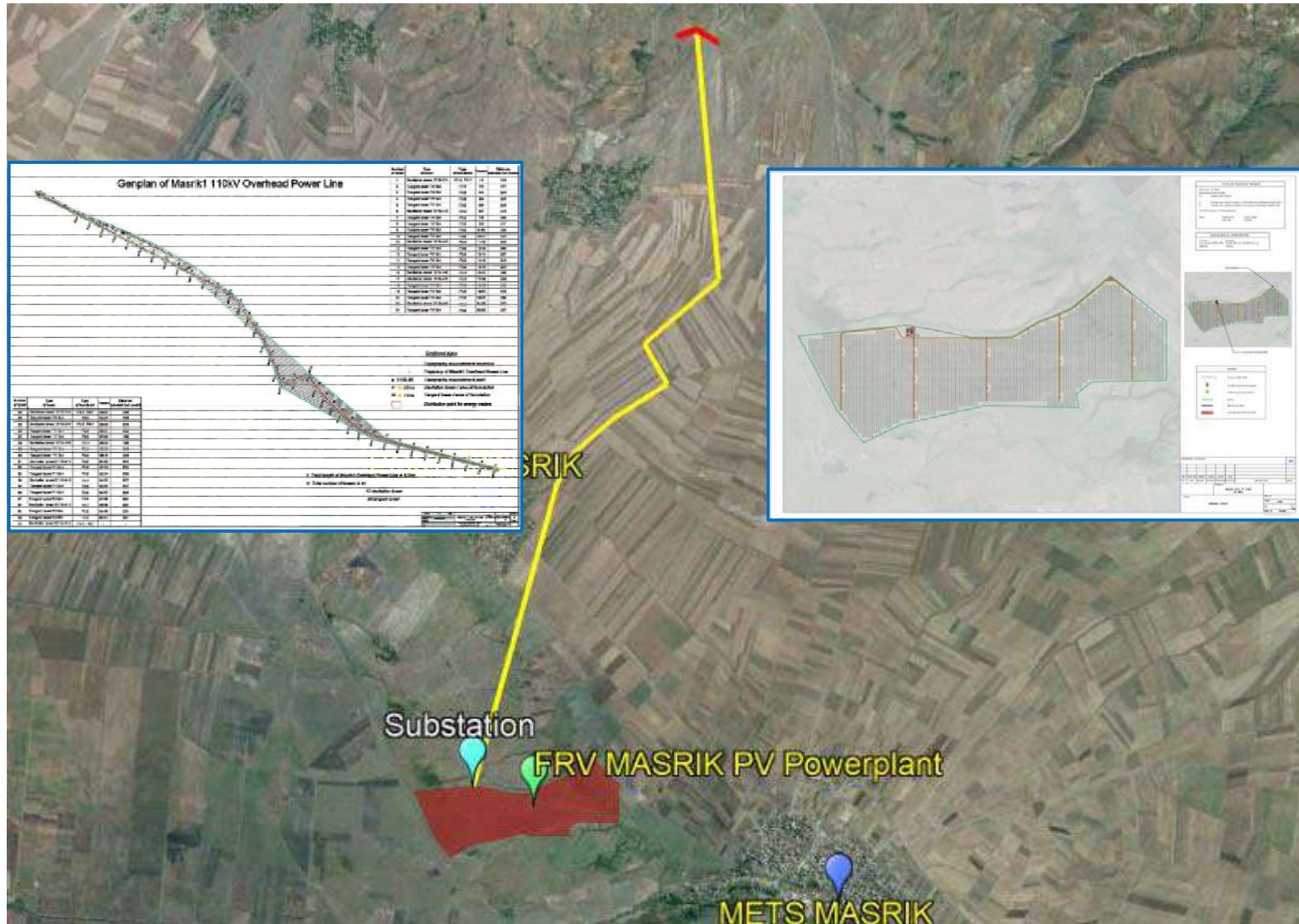
Figure 3: Typical PV Power Arrays Composed of PV Panels

Other buildings and infrastructure needed onsite include:

- Central inverter stations which converts electricity from the panels from Direct Current (DC) to Alternating Current (AC). Inverter stations connect to a substation through underground cables;
- Substation which converts voltage from 33kV to 110kV that is appropriate for connection with the High Voltage National Grid (110 kV);
- Building Infrastructure will mostly include offices for normal daily-operational related work, as well as a warehouse for storage of equipment and machinery;
- Road network to include an internal road network for ease of access to the arrays for operation and maintenance purposes as well as security road around the perimeter of the Project site for security patrolling;
- Fencing around the entire facility and security will be required to ensure safety from criminal activity and trespassing of unauthorized personnel; and
- All consumables needed for the works and the operation of the site facilities (water, electricity, telecom, etc.) as well as their connection works;
- An Overhead Line (OHL), with a length of 9.2km, from the Project Site to connect to the High Voltage National Grid (110kV).

The Project will provide up to 240 jobs during the construction phase for a duration of eighteen (18) months which will include unskilled labour (e.g. security personnel), semi-skilled labour (electricians, welders, fitters, etc.) and skilled labour (engineers and management professionals). During operation, the Project will provide approximately 12 jobs for a duration of 20 years, which will include skilled labour (such as electrical and mechanical technicians) and unskilled labour (such as module cleaners and security personnel).

Figure 4: Project Site and OHL



1.4 PROJECT PHASES

- Planning and Construction Phase (January 2020– July 2021): This phase includes preparation of a detailed design for the Project, planning and transportation of the various Project components to the site (e.g. PV modules), and onsite preparation activities for installation of the PV arrays and various other components. Site preparation activities could include excavations, grading, and land clearing activities.
- Operations Phase (2021- approximately 2041): This phase involves operation and maintenance of the PV Power Arrays and all the various electrical equipment. This includes, for example, regular PV module cleaning to prevent dust build-up which could affect their performance. Operation phase also includes commissioning tests which involves standard electrical tests for electrical infrastructure as well as the panels, and inspection of routine civil engineering quality records.

Subject to the Developers and RA agreeing the terms and conditions, the operation phase may be extended.

- Decommissioning Phase (to be determined): After the operation phase the plant will be decommissioned and the panels are dismantled. Decommissioning activities could include the disconnection of the various Project components (PV array, central inverter stations, delivery station, etc.) for final disposal. In addition, internal road network will be restored, and gates and fences will be removed.

2 OBJECTIVES

The objective of this ESMP is to ensure that all steps are taken to address the potential impacts of the project.

The ESMP:

- Draws together the measures proposed to mitigate negative, and to maximize positive, environmental and social impacts, and groups them logically into components with common themes;
- Define a proposed structure to govern the implementation of the ESMP;
- Define the specific actions required, roles and responsibilities for these actions, timetables for implementation, and associated costs;
- Provide a detailed Monitoring Management Plan
- Provide a basis for the site-specific construction Management Plans, which will be developed by the Contractor

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The Environmental and Social Management Plan is prepared to ensure compliance with the International Financial Intermediaries environmental safeguard requirements and all applicable laws, regulations and standards for environmental protection in Republic of Armenia. The ESMP contains the measures to mitigate and prevent the unwanted effects that may arise during the Project implementation, as well as the monitoring actions to check the compliance of construction works implementation process to the planned mitigation measures through the whole Project cycle: from the engineering design phase, preconstruction, construction through the operation and maintenance periods.

3 EU, IFC AND EBRD APPLICABLE PERFORMANCE STANDARDS

FRV will apply the IFC Performance Standards to manage environmental and social risks and impacts.

In addition to the requirements of IFC, the ESMS/ESMP also considers:

- [IFC Environmental, Health and Safety \(EHS\) General Guidelines and EHS Guidelines for Electric Power Transmission and Distribution](#) (“IFC, 2007”) and [IFC Performance Standards on Environmental and Social Sustainability](#) (“PSs”) (“IFC, 2012”), EBRD Environmental and Social Policy 2019 (EBRD, 2019) and other good international industry practices (“GIIPs”) as referenced therein;
- [Workers' accommodation: processes and standards \(a guidance note by IFC and the EBRD\)](#)
- EU Directives on environmental protection, occupational safety and health and ;
- the ISO 14001 environmental management system standard¹; and
- the ISO 45001 occupational health and safety².

The eight IFC Performance Standards and EBRD Performance Requirements establish standards that FRV Masrik is to meet throughout the life of project Masrik (Performance Standard 7-Indigenous Peoples is not applicable):

- Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts
- Performance Standard 2: Labor and Working Conditions
- Performance Standard 3: Resource Efficiency and Pollution Prevention
- Performance Standard 4: Community Health, Safety, and Security
- Performance Standard 5: Land Acquisition and Involuntary Resettlement
- Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources

¹ ISO 14001:2004, Environmental management systems – Requirements with Guidance for Use; International Organization for Standardization, Geneva, Switzerland, 2004. FRV’ process of certification 14001 is ongoing. The certification is expected to be granted in March 2020

² ISO 45001, Occupational health and safety – Requirements with Guidance for Use; International Organization for Standardization, Geneva, Switzerland, 2018. FRV’ process of certification 45001 is ongoing. The certification is expected to be granted in March 2020

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- Performance Standard 8: Cultural Heritage
- EBRD Performance Requirement 10: Information Disclosure and Stakeholder Engagement

4 POLICY

4.1 LEGAL AND REGULATORY FRAMEWORK

The implementation of any activity in Armenia which may cause environmental impacts needs a positive conclusion outcome from an Environmental Impact Assessment (EIA) expertise.

Environmental impacts of a planned physical activity or a sectorial or regional development plan/program has to be assessed during the pre-implementation period. The Republic of Armenia (RA) Law on Environmental Assessment and Expertise of 2014 stipulates provisions regarding to environmental impact assessment, impacting the environment and conditions under which causing of such impact is allowed, thus, eventually it is the most important national law for EIA development.

According to this law, activities are classified into 3 categories: A, B and C. The activities related to solar power plant are included in category C if the power plant occupies 40 hectares or more as in the case of Masrik 1 Solar Plant, which occupies 128.3 ha.

EIA expertise shall also be conducted for construction of high voltage overhead power lines, which is according to the Law of the RA on EIA are the overhead power lines of 110 kV (category "B") or higher voltage.

The PV Plant of Masrik 1 will occupy 97.5 ha area, and the voltage of the OTLs will be 110 kV, thus, according to this Law, Masrik 1 PV plant is subject to the environmental expertise under category B. Positive conclusion has been received from the Center of Expertise for Environmental Impact Assessment SNCO under the ME of RA (Annex A).

Constitution

In accordance with article 12 of the Constitution of the Republic of Armenia (adopted in 1995 and amended in 2005 and 2015) "The State stimulates protection, improvement and restoration of the environment and reasonable use of the natural resources based on the principle of steady development and taking into account the responsibility to the future generation. Everybody is obliged to take care of environmental protection". Article 85 of the constitution provides that "Everyone has, in accordance with the law, the right of health protection".

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

Land Code (2001)

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The preamble of the Land Code stipulates that the possession, disposition and use of lands shall not cause damage to the environment, defensibility and security of the country shall not violate the rights and lawful interests of citizens and other persons. The Land Code defines the main directions for use and disposition 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 also defines the lands under the specially protected areas as well as forest, water 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 Government of the Republic of Armenia directly or by means of the authorized bodies implements the State management of the land resources of the RA.

Following the requirements of this Code, the decree on the establishment of technical regulations for general requirements for protection of lands from pollution, list of substances polluting the lands, and assessment of level of land pollution (24.08.2006 N1277-N) was adopted by the Government of the Republic of Armenia. **The RA Government Decrees “On Approval of the Technical Regulations for Definition of the Norms for Topsoil Removal and for Removed Topsoil Maintenance and Use” number 1026-N of July 20, 2016 and “On Recognizing Void the RA Government Decree number 1026-N of July 20, 2006” (02.1.2017 number 1404-N).**

“Calculation and Indexing Procedure of Reclamation Activities Estimated Values” was adopted by the Order of the RA Minister of Nature Protection number 365-N of 24.12.2012.

Masrik 1 PV plant's and OTL's land allocation will be carried out according to the provisions of this Code.

Water Code (2002)

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 (2005) and National Water Program (2006), water cadastre and monitoring system, public access to the relevant information, water use and water system use permitting systems, trans-boundary water resources use, water quality standards, hydraulic structures operation safety issues, protection of water resources and state supervision.

A PV plant does not use water to generate electricity. Only minimum quantities of water are used during construction works, apart from the drinking water needs for workers.

Code on subsoil (2011)

The code defines principles and rules of mining in the RA, the relations related to preservation and use of the deposits, conditions and requirements of efficient use, complex use and preservation of deposits, security of mining and protecting the environment from its negative impacts, as well as protection of rights of the state, citizens and users of deposits. According to the Code, natural deposits are under the exclusive ownership of the state. They may be given out for use for a certain period of time, and cannot be privatized. The law also determines conditions, requirements and peculiarities of the natural resources and deposits. It also establishes payment principles, compensation, monitoring, and limitation for mining activities.

If due to the construction works it will be more appropriate to carry out the inert materials' (sand, gravel) supply from their own mine, all registrations will be done according to the requirements of this Code.

Labour Code

The Labour Code of the RA, adopted on 9 November 2004, protects the rights and interests of employees and employers in collective and individual employment relationships, establishes state guarantees for labour rights and freedoms, and promotes the creation of favorable conditions of work.

The labour relations between the employee and employer are originated on the basis of labour contract concluded in a procedure established by the Labour Code and other normative legal acts containing norms on labour Code.

Activities and operations of the project shall be implemented in accordance with the mentioned Code in order to assure the protection of the rights and interests of the employees.

Law on Ensuring Sanitary-epidemiological Security of the RA Population (1992)

The Law On Ensuring Sanitary-Epidemiological Security of the RA Population was adopted in 1992, which sets legal, economic and institutional bases for ensured sanitary and epidemiological safety of the population, as well as other guaranties provided for by the State to exclude influence of adverse and hazardous factors on human organism and ensure favorable conditions for vital capacity of the present and future generations.

Sanitary-epidemiological conditions of the staff must comply with the terms of this law.

Law on Provision of Medical Care and Services to the Population (1996)

The Armenian Law on Medical Care and Services to the population establishes the legal, economic and financial guidelines for medical care and service delivery, which ensures the realization of people's constitutional right to preserve their health.

Activities and operations of the project shall be implemented in accordance with the mentioned laws in order to insure health and safety of the employees as well as of the surrounding population.

Law on the Protection and Use of Fixed Cultural and Historic Monuments and Historic

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Environment (1998)

The Law on the Protection and Use of Fixed Cultural and Historic Monuments and Historic Environment was adopted by the National Assembly on November 11, 1998. It provides the legal and policy basis for the protection and use of such monuments in Armenia and regulates the relations between protection and use activities. Article 15 of the Law describes procedures for, among other things, the discovery and state registration of monuments, the assessment of protection zones around them, and the creation of historic-cultural reserves. Article 22 requires approval of the authorized body (Department of Historic and Cultural Monuments Preservation) before land can be allocated for construction, agricultural and other types of activities in areas containing monuments.

The issues regarding to the cultural and historical monuments in Masrik 1 PV plant's and OTL's sites will be regulated by this law, as well as the World Bank policy. Although no historical values exist on the site, the LAW should be considered because non-recognized resources can be found during the project implementation.

Law on Flora (1999)

The law defines RA state policy in the field of maintenance, protection, usage and regeneration of flora. The law defines objectives of flora examination, state monitoring, state inventory, requirements and approaches of red book preparation on flora, conditions, peculiarities, limitations of allocation of flora objects for purposeful usage, basis of termination of the right to use, provisions on flora maintenance, and economic encouragement of usage and implementation of supervision. The law also defines the rights and obligations of the state governance and local governmental bodies in the field of flora maintenance, protection, reproduction and usage, mechanisms of state inventory, principles of deciding their indicator.

In Masrik 1 PV plant's and OTL's sites, the natural flora's protection norms are regulated by the law above.

Law on Fauna (2000)

The law defines RA state policy in the field of maintenance, protection, usage and regeneration of fauna. The law defines the objectives of survey of the fauna, state monitoring, state inventory, requirements and approaches of red book preparation on fauna, conditions, peculiarities, limitations of allocation of fauna objects for purposeful usage, basis of termination of the right to use, provisions on fauna maintenance, and economic encouragement of usage and implementation of supervision. The law also defines the rights and obligations of the state governance and local governmental bodies in the field of flora maintenance, protection, reproduction and usage.

In Masrik 1 PV plant's and OTL's sites, the wildlife protection measures are regulated by this law.

To ensure compliance with the requirements of this Law, the RA Government approved the Red Book of Animals of the Republic of Armenia with its Decree number 71-N of

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29.01.2010 and the Red Book of Plants of the Republic of Armenia - with its Decree number 72-N of 29.01.2010.

Law on Wastes (2004)

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 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.

Constructional and daily waste management occurred during the construction and operation of PV plant must comply with this law.

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.

The compliance with the environmental legislaion during construction and operation of the Masrik 1 Power Plant will be controlled by the Environmental Protection and Mining Inspectorate as per the provisions of this Law.

Law on Specially Protected Natural Areas (2006)

The law defines legal basis and relations of state policy for development, restoration, maintenance, reproduction and use of natural complex and separate objects, as well as ecosystems of specially protected natural areas of the Republic. According to the law, specially protected natural areas are divided into four categories, National parks, State Reserves, Natural museums and the forth category is divided into three separate types: areas of international, republican and local importance. Law defines concepts, regimes of maintenance, principles of preparation of specially protected natural areas management plans, monitoring, calculation and state registrar, as well as the requirements of usage, limitations and principles, rights and obligations of state governmental and local

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governmental bodies, maintenance bodies of the protected areas, the rights public to get an information on protected areas, financial sources of protected areas, requirement of supervision and responsibility for violating the Law on Specially Protected Natural Areas.

Masrik 1 PV plant's territory is located in "Sevan" National Park's buffer zone.

RA Health Minister's N 01-N order as of January 25, 2010, «On approving sanitary rules and norms of soil quality hygiene requirements N 2.1.7.003-10».

The sanitary rules and hygienic norms determine the hygienic requirements of soil quality, such as the hygienic evaluation of land sanitary condition, soil quality monitoring, assessment of main indicators of the sanitary condition of the soil, depending on their functional significance, as well the degree of soil pollution on land use proposals.

RA Health Minister's N 533-N order as of May 17, 2006, «On approving HN N 2.2.4-009-06 vibration hygiene norms at workplaces, residential and public buildings».

The hygienic norms determine the vibration classification, regulation standards, the maximum permissible level of vibration at workplaces, as well as the permissible levels of vibration at residential and public buildings.

Protocol Decree N 54-13 of the Government of the RA dated 10 December 2015 On Approval of the Program "Ways of long-term (up to 2036) development of the energy system of the Republic of Armenia".

The program of strategic development of the energy system titled as "Ways of long-term (up to 2036) development of the energy system of the Republic of Armenia" was developed and adopted by the Government of Armenia in 2015.

The document is based on the Armenia Least Cost Energy Development Plan prepared under the USAID Project "Low Emissions Strategies and Clean Energy Development in E&E" and USAID grant "Support to National and Regional Energy Planning and Capacity Building at the Scientific Research Institute of Energy". At the same time, the World Bank, which is financing diverse energy system infrastructure development projects, initiated the analysis of Armenian energy system and presented a number of proposals.

Energy Security Concept of the Republic of Armenia" (adopted by the President of RA, 2013)

Energy Security Concept of the Republic of Armenia is aimed to ensure the energy security of the Republic of Armenia in conformity with the provisions of the national security strategy. According to this concept energy security is a complex of political, economic, legal, organizational and other measures which aim to provide reliable and high-quality power supply on daily basis, as well as in emergency situations and in times of war.

The implementation of this document is motivated by the rapidly developing social-economic and political situation in the region, the global economic crisis, as well as by need to ensure RA's energetic independence and security in times of possible emergencies and war. The document also has an objective to ensure RA's proper engagement in

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regional programs organized by international organizations, the European Union, the Russian Federation and the United States of America and finally by the importance of creating long term strategic supply (stock) of fuel and energy resources.

5 GENERAL REQUIREMENTS

a. ESMS Structure and Documentation.

The ESMS Plan will be periodically reviewed and updated in response to the changes that will occur in various phases over the life of the Project. It will serve as a primary reference for the overall design and contents of the ESMS and is meant to serve as a key communication tool in the presentation of the ESMS to the Project’s lenders, regulatory authorities, and other external stakeholders.

The ESMS Plan will be supported by a suite of management/mitigation plans to be prepared by FRV and the EPC contractor, under FRV MASRIK CJSC’s direction. The management/mitigation so prepared will consider the requirements of the underlying standards noted in Table 2 and will be focused on the management or mitigation of the specific environmental and social issues or impacts associated with one or more phases of the Project.

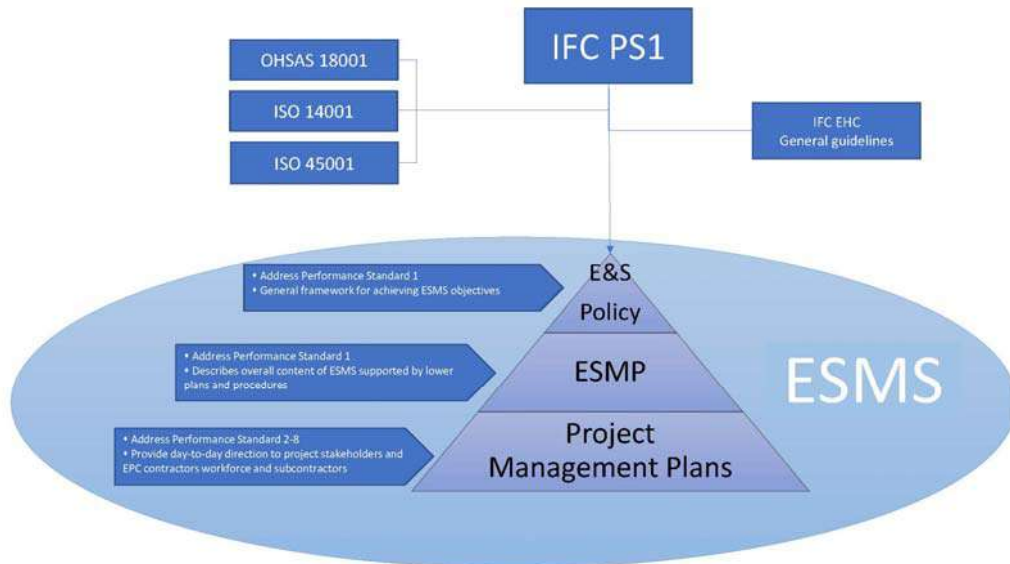


Figure 5: ESMS document hierarchy

This ESMP is a part of the ESMS which is supported by the list of management/mitigation plans in table 2.

The ESMS for project Masrik has been prepared in accordance with the requirements applicable to FRV MASRIK and identified in the ESIA and the ESAP.

Documents	EPC	FRV Masrik CJSC	Timing for issuance
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Framework ESMP		X	Prior first disbursement Implemented throughout construction and operation
Construction ESMP	X		Prior construction
Code of Conduct for employees and contractors		X	Prior construction
Stakeholders Engagement Plan		X	Prior construction
Grievance redress Mechanism Plan		X	Prior construction
Occupational Health and Safety Plan (OHS Plan) (see section 7.1.3)	X		Prior construction
Community Health and Safety Plan	X		Prior construction
Traffic Management Plan (see section 7.1.18)	X		Prior construction
Emergency Preparedness and Response (see section 7.1.20)	X		Prior construction
Erosion and Sediment Control Management Plan	X		Prior construction
Site clearing, Flora and Fauna Plan	X		Prior construction
Avifauna Monitoring Plan		X	Prior construction
Archaeological/Cultural Heritage Chance Finds Procedure	X		Prior construction
Dust management Plan	X		Prior construction
Water Resources Plan	X		Prior construction
Wastewater management Plan	X		Prior construction
Waste Management Plan	X		Prior construction
Hazardous materials management Plan	X		Prior construction
Noise pollution minimization Plan	X		Prior construction
Site Security and Security Management Plan	X		Prior construction
Local Employment plan ³	X		Prior construction
Workforce plan	X		Prior construction

³ https://www.ebrd.com/downloads/about/sustainability/Workers_accomodation.pdf

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Workers accommodation management Plan	X		Prior construction
Community Integration Plan	X		Prior construction

Table 2: E&S Management System

b. Role and responsibilities

Who	What
Project Company: FRV Masrik CJSC	<ul style="list-style-type: none"> - Takes the overall responsibility for ensuring that all Project-related activities are carried out in compliance with the lenders E&S requirements and Armenian regulations. - Establish objectives for E&S performance and ensure contractors has appropriate environmental controls & systems in place - Establish ESMS and perform E&S activities required to mitigate impacts other than those caused by construction methods and operation & maintenance activities - Approve sub-plans developed by the Contractor
EPC Contractor: CMEC	<ul style="list-style-type: none"> - Prepare detailed E&S Management plans as outlined in Table 2 and schedule works in a way that avoids or minimizes adverse E&S effects acts - Seek approval of plans from the Project Company - Conduct activities in accordance with Management Actions listed in this ESMP - Etc.
Governmental Agencies	<ul style="list-style-type: none"> - Assessment of the implementation processes with the applicable regulation

Table 3: Roles and responsibilities

c. E&S organization

Figure 6 depicts the organization of key ESMS implementation roles during the construction phase of the project

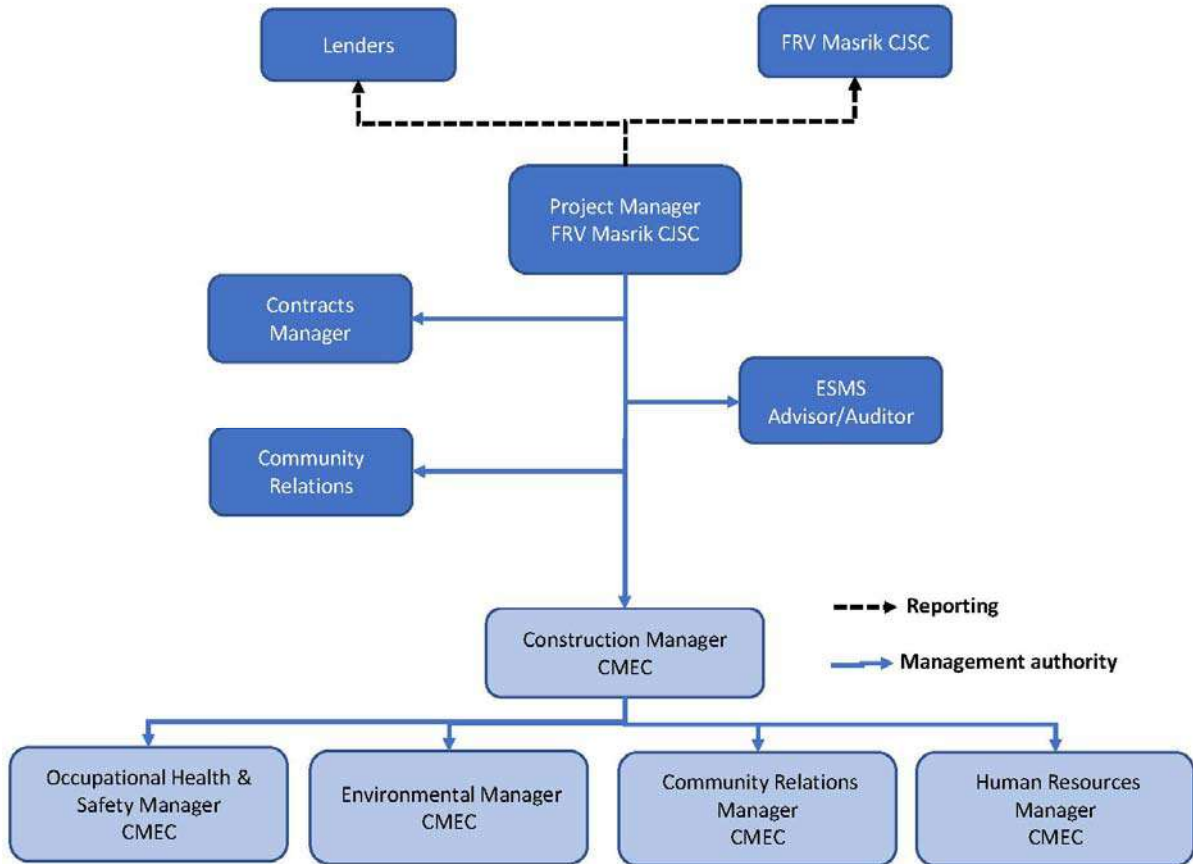


Figure 6: Organizational chart during construction phase

Figure 7 depicts the organization of key ESMS implementation roles during the operation phase of the project

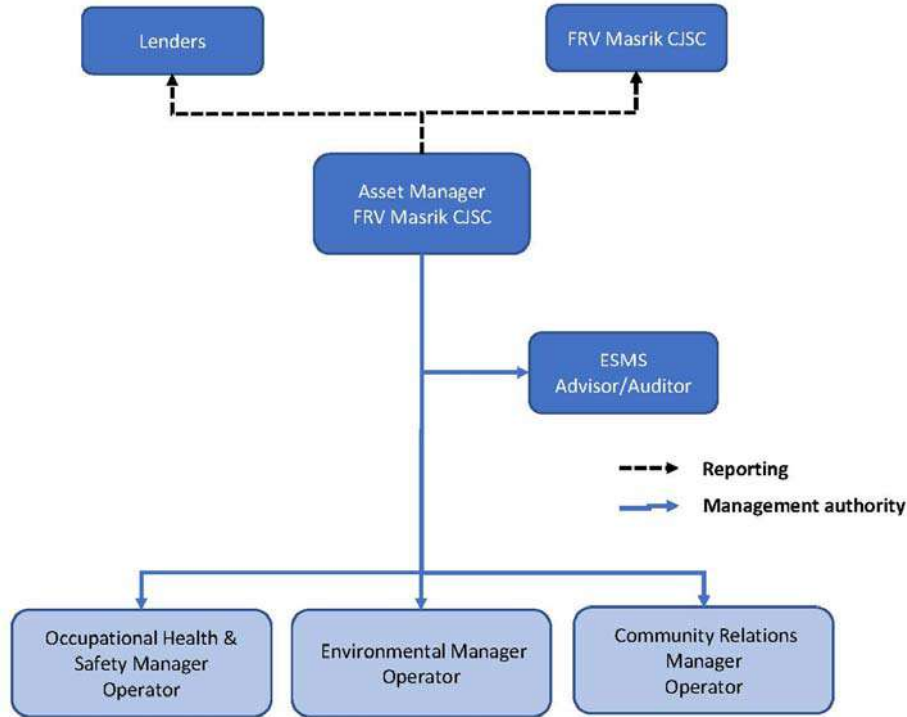


Figure 7: Organizational chart during operation phase

Specific responsibilities and key positions noted in figures 6 and 7 are summarised below:

Project Manager for FRV Masrik CJSC: The “Project Manager” appointed by FRV MASRIK CJSC have overall responsibility for successful completion of Project activities in the manner described in this ESMP and the supporting management/mitigation plans described herein, and will serve as FRV MASRIK CJSC’s primary liaison contact with the CMEC Construction Manager and management staff. The Project Manager also assume a lead role in the investigation and resolution of any community relations or labor grievance that may occur in the course of the Project.

- Contracts Manager for FRV MASRIK CJSC: The “Contracts Manager” appointed by FRV MASRIK CJSC, among its other responsibilities, works with the ESMS Advisor/Auditor to ensure that appropriate elements of the ESMS are reflected in the CMEC EPC Contract in particular, and to other contractor procurement documents as appropriate for the goods or services provided.

- ESMS Advisor/Auditor for FRV MASRIK CJSC SA: The “ESMS Advisor/Auditor” appointed by FRV MASRIK CJSC works with the Contracts Manager to ensure that appropriate elements of the ESMS Plan are reflected in the ESMS EPC Contract in particular, and to other contractor procurement documents as appropriate for the goods or services provided. The ESMS Advisor/Auditor also is responsible for coordinating or conducting the compliance verification, internal audit, and management review processes if applicable, as well as serving as an overall technical resource to the CMEC Environmental and OHS Managers with respect to ESMS implementation.

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The ESMS advisor/auditor is also responsible for the regular monitoring of project activities to ensure continuing compliance with this ESMP.

- Community Relations Manager for FRV MASRIK CJSC: The “Community Relations Manager” appointed by FRV MASRIK CJSC is responsible for overseeing the activities of the CMEC Community Relations Manager and the overall implementation of the CMEC Stakeholder Engagement Plan.

The Community Relations Manager also coordinates with the FRV MASRIK CJSC Project Manager and the CMEC Community Relations Manager in the investigation and resolution of any community grievances or other issues that involve local communities or external stakeholders.

- Construction Manager: The CMEC “Construction Manager” is responsible for overseeing day-to-day environmental clearance and/or construction activities. These duties include review of construction reports to monitor progress and issues encountered, and in providing the resources and otherwise assisting the Environmental and Health and Safety Officers in the timely resolution of any observed health, safety, and environmental (HSE) issues.

- Environmental Manager: The CMEC “Environmental Manager” is responsible to the Construction Manager and the FRV MASRIK CJSC Project Manager for administering the environmental aspects of the ESMS, and participates in the review, approval, and as necessary, update or modification of this ESMP and supporting management/mitigation plans in response to changing project conditions. The Environmental Manager will provide input to periodic HSE monitoring reports and may also conduct focused inspections of specific environmental issues at the request of the Construction Manager or the FRV MASRIK CJSC Project Manager or ESMS Advisor/Auditor.

- OHS Manager: The CMEC “OHS Manager” is responsible to the Construction Manager and the FRV MASRIK CJSC Project Manager for administering the OHS aspects of the ESMS, and participates in the review, approval, and as necessary, update or modification of this ESMP and supporting management/mitigation plans in response to changing project conditions. The OHS Manager will also be responsible for periodic monitoring of project activities to ensure continuing compliance with the OHS elements of the ESMS. The OHS Manager also provides input to HSE monitoring reports and may also conduct focused inspections of specific health and safety or social/community relations issues at the request of the Construction Manager or the FRV MASRIK CJSC Project Manager or ESMS Advisor/Auditor.

- Community Relations Manager: The CMEC “Community Relations Manager” is responsible for managing interactions with local communities with respect to public health and safety, security, and other social concerns as defined in the Stakeholder Engagement Plan. The CMEC Community Relations Manager also coordinated with the FRV MASRIK CJSC Community Relations Manager and the Project Manager in the investigation and resolution of any community grievances or other issues that involve local communities or external stakeholders

- Human Resources Manager: The CMEC “Human Resources Manager” assists the Construction Manager in the training program and resolution of any workforce concerns or complaints that may be encountered in the course of the Project. The Human Resources

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Manager also supports the FRV MASRIK CJSC Project Manager in the investigation and resolution of any labor grievances that may occur in the course of the Project.

d. Change Management.

This ESMP is prepared to support the start of the construction phase of the Project. The adequacy and effectiveness will be evaluated, and updates initiated for later phases of the Project, as appropriate.

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6 SUMMARY OF IMPACTS AND COMMITMENTS.

Social and Environmental Aspects and Impacts, Risk Assessment, and Risk Management planning Issue / Potential Impact	Mitigation Measures	Responsible party	Project document where Mitigation Measures are elaborated	Period for Implementation
Disturbance and physical damage to Flora and Fauna	Conduct vegetation removal, site clearing or other type of physical activities that can damage environment before month April or after June not to disturb breeding or nesting of the birds	EPC	Site clearing, Flora and Fauna Plan	During construction
	Careful design of new access roads (if any); avoid access roads crossing creeks and rivers	FRV and EPC	Design documentation	During design
	Mark extent of the lay down areas and the routing of the access roads	EPC	Construction ESMP	During construction
	Use existing roads / tracks as far as possible; refurbish existing access roads /	EPC		During construction
	Tower locations without access track shall be reached along the ROW if possible	EPC		During construction
	Prohibit plant-collecting and hunting; instruct workers not to disturb animals	EPC	Site clearing, Flora and Fauna Plan	During construction
	Re-vegetate all disturbed areas and rehabilitate access roads, workers' camps, lay down and deposit areas with site specific and adaptive plant species	EPC	Site clearing, Flora and Fauna Plan	After construction
	Build (plant) protective green zone around the solar plant	EPC	Site clearing, Flora and Fauna Plan	After construction
	Carry out the care of restored and newly planted green zones	O&M contractor	Site clearing, Flora and Fauna Plan	During operation
	Strict prohibition of herbicide use for maintaining the ROW	O&M contractor	Site clearing, Flora and Fauna Plan	During operation

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Social and Environmental Aspects and Impacts, Risk Assessment, and Risk Management planning Issue / Potential Impact	Mitigation Measures	Responsible party	Project document where Mitigation Measures are elaborated	Period for Implementation
	Check proper adjustment of bird diverters during maintenance works of towers (pillars)	FRV	Avifauna Monitoring plan	During operation
	If Red Book nesting places, burrows, and holes of animals discovered, inform ME.	FRV	Avifauna Monitoring plan	During construction
	The project will select a design of transmission line that eliminates the risk of bird collision. The project will install bird flight diverters to minimize collision risk. Project will also design T-line pylons and conductors to prevent electrocution to birds.	FRV	Design documentation	During design
	The project will develop and implement a bird mortality monitoring program to assess impacts of the Transmission line. If any bird species are found injured along the Transmission line during post construction monitoring, they will be transferred to a rehabilitation center for veterinarian care and potential re-release into the wild.	FRV	Avifauna Monitoring plan	3 years after start of operations
	The project will conduct consultations with stakeholders of the Ramsar site, and implement additional programs, as appropriate, to promote and enhance the conservation aims and effective management of the area.	FRV	Minutes of consultation meetings and Submission of program reports as appropriate.	Condition of first disbursement
Erosion Control	Minimize removing topsoil at all construction sites and ROW	EPC	Erosion and Sediment Control Management Plan	During construction
	Bring back topsoil to its original place, after having finished the construction works and erection of the towers	EPC		After construction works
	Reseeding / replanting of native grass / shrub species at tower sites	EPC		During construction

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Social and Environmental Aspects and Impacts, Risk Assessment, and Risk Management planning Issue / Potential Impact	Mitigation Measures	Responsible party	Project document where Mitigation Measures are elaborated	Period for Implementation
	Implement erosion prevention measures at access roads: 1. protect the soil surface with some form of cover 2. control runoff before it develops into an erosive force.	EPC		During construction
	Avoid deposits of loose spoils on steep slopes or near rivers: Mets Masrik and drainage channels of the nearest land plots	EPC		During construction
	Protect excess spoils from runoff	EPC		During construction
	Excess spoil and soil will be left in orderly piles, covered with topsoil, and re-vegetated with native species	EPC		During construction
	Avoid construction near watercourses	EPC		During construction
	Rehabilitation of new access roads not needed anymore after construction works	EPC		After construction works
	Repair landscape damage due to work in wet weather as soon as possible when construction is complete in that area	EPC		After construction works
	Carry out the care of restored and newly planted green zones	O&M contractor		During operation
	Implement drainage control measures (culverts, berms, etc.) on permanent access roads, if they are in steep or erosion prone areas	O&M contractor		During operation
	Minimize off-road vehicle and equipment use	O&M contractor		During operation
Activities concerning Soil and Water Pollution	Regular maintenance of all vehicles and machines at regular service stations, if possible	EPC	Construction ESMP	During construction
	Maintenance and re-fuelling of the construction equipment only on sealed and enclosed areas	EPC		During construction
	Store all liquid materials (e.g. fuel, engine oil, etc.) and lubricants in locked tanks and on sealed and roofed areas	EPC		During construction
	Store construction material as bags of cement etc. in containers in order to avoid rinsing out	EPC		During construction

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Social and Environmental Aspects and Impacts, Risk Assessment, and Risk Management planning Issue / Potential Impact	Mitigation Measures	Responsible party	Project document where Mitigation Measures are elaborated	Period for Implementation
	Train workers in appropriate sanitation practices	EPC and O&M contractor		During construction and operation
	Place plastic or other protective cloth under any areas where towers or other materials will be painted	EPC		During construction
	Train transporters and workers in spill prevention and control especially in handling of oil and fuel	EPC		During construction
	Provide spill-control materials to drivers and workers, in order to clean up spills, if necessary	EPC		During construction
	Report and respond to spills promptly and train workers in how to report	EPC		During construction
	Remove contaminated soil if spills occur and handle as hazardous waste	EPC and O&M contractor	Construction ESMP and Hazardous materials management plan	During construction and operation
	Collect contaminated spill materials and manage as hazardous waste	EPC and O&M contractor	Construction ESMP and Hazardous materials management plan	During construction and operation
	Repair any damage to riparian areas, including riverbanks and riverbeds (if any), as soon as construction is complete	EPC	Construction ESMP Site clearing, Flora and Fauna Plan	After construction
	Provide a drainage for precipitation flows from modules	EPC and O&M contractor	Construction ESMP	During operation
	Quantify water requirements for construction (including non-potable water to be used for dust control) and operation phases of the project.	EPC	Water Resources Plan	Prior to construction

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Social and Environmental Aspects and Impacts, Risk Assessment, and Risk Management planning Issue / Potential Impact	Mitigation Measures	Responsible party	Project document where Mitigation Measures are elaborated	Period for Implementation
	Assess potential impact on availability of water resources to local communities			
Waste Management	Select the dump site and get the preliminary agreement with the head of community or with the owner	EPC	Waste Management Plan	During design
	Store all hazardous waste (e.g. oil, fuel, paint, spill contaminated soil) in adequate storage sites	EPC	Waste Management Plan and Hazardous materials management plan	During construction
	Collect all type of wastes including domestic and sanitary wastes. Agree with municipal authorities about using services of communal service providers for waste disposal purposes.	EPC and O&M contractor	Waste Management Plan	During construction and operation
	Train workers in handling and disposal of recyclable, sanitary, solid, liquid and hazardous waste	EPC and O&M contractor	Waste Management Plan and Hazardous materials management plan	During construction and operation
	Only certified companies shall be contracted for waste recycling	EPC and O&M contractor	Waste Management Plan	During construction and operation
	Avoid disposal of waste in any non-approved and non-permitted area.	EPC	Waste Management Plan	During construction
	Build biological treatment plant for wastewater treatment in the structure of administrative building. It is planned to install the cell-modular container treatment plant – of BMOS or equivalent type, of 5m3/day capacity	EPC	Waste Management Plan	Before the operation phase

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Social and Environmental Aspects and Impacts, Risk Assessment, and Risk Management planning Issue / Potential Impact	Mitigation Measures	Responsible party	Project document where Mitigation Measures are elaborated	Period for Implementation
Landscape and Visual Aspects	Dismantling of workers' camps and harmonization of the areas with the landscape <ul style="list-style-type: none"> All waste will be removed, and the surface levelled All temporary buildings, fencing, machinery, equipment and vehicles will be removed from the site All fuel storage areas will need careful inspection and any contaminated soil removed The site will be re-vegetated as required 	EPC	Construction ESMP Workers accommodation management Plan	After construction
Noise	Optimization of transportation management to avoid needless truck drives	EPC and O&M contractor	Noise pollution minimization Plan	During construction and operation
	Location of noisier activities away from sensitive receptors where practicable.	EPC		During construction
	Allow truck movements only during daylight	EPC and O&M contractor		During construction and operation
	Reduce vehicle speeds (30km/h in the construction site and access roads)	EPC and O&M contractor		During construction and operation
	Use low sound power mechanical equipment, whenever possible	EPC		During construction
	Regular maintenance and service of building machinery and other vehicles	EPC		During construction
	Shut down or throttling down of noisy machinery to a minimum	EPC		During construction

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Social and Environmental Aspects and Impacts, Risk Assessment, and Risk Management planning Issue / Potential Impact	Mitigation Measures	Responsible party	Project document where Mitigation Measures are elaborated	Period for Implementation
	For workers noise levels shall be kept below 80 dB (A), wherever possible. In case of exceeding this value, hearing protections must be provided to workers and warning signs must be installed	EPC and O&M contractor		During construction and operation
	For residents the noise levels may not exceed: - Daytime 7:00-22:00 55 dB - Nighttime 22:00-7:00 45 dB or result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site	EPC and O&M contractor		During construction and operation
	Notify nearby residents at least 24 hours in advance if particularly noisy activities are anticipated	EPC and O&M contractor		During construction and operation
Activities concerning Air Quality	Optimize transportation management to avoid needless truck trips	EPC	Traffic Management Plan	During construction and operation
	Reduce vehicle speeds (10km/h in the construction site and 30km/h in the access roads)	EPC		During construction
	Maintain vehicles and construction machinery properly, as recommended by suppliers	EPC	Construction ESMP	During construction
	Cover truck beds with tarps during material transport	EPC	Traffic Management Plan	During construction
	Use dust-suppressing water spray during civil works, where necessary	EPC	Dust Management Plan	During construction
	Store and handle material appropriately to limit dust (e.g. protect cement with tarpaulins)	EPC		During construction
	Avoid unnecessary idling of construction machines and vehicles	EPC	Traffic Management Plan	During construction

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Social and Environmental Aspects and Impacts, Risk Assessment, and Risk Management planning Issue / Potential Impact	Mitigation Measures	Responsible party	Project document where Mitigation Measures are elaborated	Period for Implementation
	Prohibit open burning of construction / waste material at the site	EPC and O&M contractor	Waste Management Plan	During construction and operation
	Train maintenance workers accordingly	EPC and O&M contractor	Construction ESMP	During construction and operation
Risks for Historical and Cultural Sites	Implementation of Chance Find Procedure and training of the construction workers	EPC	Archaeological/Cultural Heritage Chance Finds procedure	During construction
	Report chance finds immediately to the Ministry of Culture of RA, Dep. Protection of Monuments and Historical Sites	EPC		During construction
Risks for Public and Employee Health and Safety	Make sure that all workers have a health insurance	EPC	Occupational Health and Safety Plan & Community Health and Safety Plan Workers' accommodation Plan	Before construction
	Provide proper sanitation facilities with hand-washing facilities in adequate number, separately for men and women	EPC		Before construction
	Provide HIV/AIDS protection equipment for workers	EPC		Before construction
	Install warning signs "Danger of Electrocutation" at towers, substations etc.	EPC		Before construction
	Accommodation of workers in adjacent villages has the first priority. In the case that construction camps are necessary these will be located in accordance with relevant municipal authorities. The standards of accommodation will be assess against international benchmarks and possible adverse impacts of workers' accommodation on the local community and identify measures to address any adverse impacts identified (e.g. impacts on community infrastructure, health and safety, and others.	EPC		Before construction

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Social and Environmental Aspects and Impacts, Risk Assessment, and Risk Management planning Issue / Potential Impact	Mitigation Measures	Responsible party	Project document where Mitigation Measures are elaborated	Period for Implementation
	Provide workers with appropriate protective equipment (PPE)	EPC		During construction
	Train workers accordingly regarding work at heights, electrical and vehicular safety, handling of hazardous materials, PPE, hazard avoidance and reduction measures, use of first aid and rescue techniques, emergency response etc.	EPC		During construction
Risks for Public and Employee Health and Safety	All work crews shall have at least one person (two is strongly preferred) trained in first aid	EPC		During construction
	Provide first aid kits and fire extinguishers at all Project sites and in all vehicles and temporary accomodation	EPC		Before construction
	If work crews are in remote areas, they shall be equipped with cellular phones or radios	EPC		During construction
	Forbid alcohol and other drugs at construction sites / workers' camps	EPC		During construction
	Set up mobile clinics for workers capable of treating all injuries and diseases occurring at the construction sites	EPC		Before construction
	Assure transfer of injured workers to hospitals in the case of serious accidents	EPC		During construction
	Identify area emergency responders, hospitals, and clinics, and provide advance notice of Project activities. Develop emergency scenarios and procedures for informing the public and emergency response agencies; and emergency response actions by employees.	EPC		During construction
	Implement programs for medical screening, health and safety monitoring, and reporting	EPC		During construction
	Limit occupational exposure to EMF by use of shielding materials, and train workers accordingly	EPC		During construction

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Social and Environmental Aspects and Impacts, Risk Assessment, and Risk Management planning Issue / Potential Impact	Mitigation Measures	Responsible party	Project document where Mitigation Measures are elaborated	Period for Implementation
	Record workhours as well as all accidents and incidents	EPC		During construction
	Notification of the public on upcoming construction activities in adjacent villages and through media, in advance of construction period	EPC		During construction
	Public education and outreach efforts to provide information about hazard awareness, safety measures, reporting unsafe conditions and environmental impacts in adjacent villages, in advance of construction period	EPC	Occupational Health and Safety Plan Community Health and Safety Plan Emergency Response Plan	During construction
	Inform population along public roads in advance in case of transporting heavy equipment	EPC		During construction
	Provide adequate security measures to prevent accidents and injury (e.g. keeping speed limits on public roads, grounding objects)	EPC		During construction
	Use warning signs at access points along main roads, and around work sites near villages or residences	EPC and O&M contractor		During construction and operation
Risks for Public and Employee Health and Safety	Provide clear and adequate signage to identify work areas and hazardous equipment, before commencement of relevant construction	EPC	Site Security and Security Management Plan	After construction
	Install warning signs at all towers and sensitize the community on dangers of electricity, and risks of electrocution	EPC		After construction
	Provide adequate security to prevent public access to the substations, work sites, hazardous materials and waste	EPC and O&M contractor		Before operation
	Establish worker code of conduct to help prevent friction or conflict with communities	FRV	Code of Conduct for employees and contractors	During construction and operation
	No houses are allowed in 50 m corridor (way leave) of the overhead line	EPC	Community Health and Safety Plan	During construction

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Social and Environmental Aspects and Impacts, Risk Assessment, and Risk Management planning Issue / Potential Impact	Mitigation Measures	Responsible party	Project document where Mitigation Measures are elaborated	Period for Implementation
	Develop a Health and Safety Management Plan (HSMP) and implement an Health and Safety Management System (HSMS) for operation and maintenance	O&M contractor	Occupational Health and Safety Plan Community Health and Safety Plan	During operation
Social Impact	Announce start and duration of works through media and signs to the public in advance of construction period	EPC	Construction ESMP	Before construction
	Limitation of construction of access roads and careful routing to minimize impacts on agricultural land	EPC		During construction
	Location of laydown areas close to existing roads in nonproductive areas to minimize interference with agricultural activities and to facilitate site clean-up and rehabilitation	EPC		During construction
	Keep speed limits in public/access roads at 30 km/h	EPC and O&M contractor	Traffic Management Plan	During construction and operation
	Minimize surface of and damage caused by workers' camps	EPC	Construction ESMP	During construction phase
	Establishment and operationalization of a grievance redress mechanism	FRV/EPC	Grievance Redress Mechanism Plan	Before construction
	Presence of an impartial person to receive complaints during the construction process	EPC		During construction
Social Impact	Develop and implement a non-discriminatory hiring and wage policy (clearly stating that the company will not discriminate in hiring and salaries based on gender, age, religion, ethnicity or place of origin) in line with IFC PS2/EBRD PR2 and local labor regulations	FRV	Project company's HR Policy Local Employment and workforce	Before construction

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Social and Environmental Aspects and Impacts, Risk Assessment, and Risk Management planning Issue / Potential Impact	Mitigation Measures	Responsible party	Project document where Mitigation Measures are elaborated	Period for Implementation
	Prioritize employment of local people for construction works. Prepare Local Employment Plan.	FRV/EPC	Workers accommodation management plan	During construction
	Legal experts will support PAP who are not registered landowners with legalization of land titles	FRV	Livelihood restoration plan	During construction
	Social consultant will work with vulnerable APs in the project area.	FRV		During construction
	Undertake a yearly monitoring of Livelihood Restoration Plan (LRP) implementation for 2 years and after conduct a completion audit to assess if all the LRP provisions have been met.	FRV		During construction
Gender Issues	Improve recruitment of women for construction works according to consultations and interviews with householder women	EPC	Local Employment and workforce Workers accommodation management plan	During construction
	Strengthen district administrations on gender issues (i.e. Social expert will check receiving complaints by women)	EPC		During construction
	Zero tolerance for sexual harassment at the workplace or in workers' camps / overnight locations	EPC		During construction

7 MANAGEMENT PROGRAMS

7.1 UNDER THE RESPONSIBILITY OF EPC CONTRACTOR

7.1.1 CONSTRUCTION ESMP

Prior construction a Construction Environmental and Social Management Plan (CESMP) will be prepared to ensure that the construction processes of the Masrik PV Power Plant Project are implemented in a manner which minimizes the environmental and social impacts associated with construction activities as specified by:

- Conditions mentioned in the environmental permit issued by Ministry of Environment (MoEnv) on July 17th, 2019 (attached in annex A);
- Commitments made in the project ESIA; and
- Commitments made by FRV to meet the Lenders requirements (please see section 3).

This CESMP, in accordance with this ESMP, will allow the EPC contractor team to:

- Establish procedures and work practices that will mitigate environmental effects;
- Ensure that the project complies with all Armenian policies and standards for environmental protection;
- Implement an effective monitoring program that will provide “real time” information on ambient environmental conditions in the vicinity of the project;
- Regularly evaluate both the construction activities and the environmental monitoring data and make any construction activity changes required to ensure that environmental conditions remain at acceptable levels; and
- Maintain high levels of environmental awareness amongst the project team.

The CESMP is a project document – to be implemented by the EPC contractor, with input from FRV Masrik CJSC and its consultant. It therefore focuses on internal environmental management including internal communications and profile building.

Plan for external communications with the local community is presented through the Stakeholder Engagement Plan (SEP). If required, the CESMP could be used as a basis for information on environmental management of the construction activities, to be communicated to any interested external parties.

7.1.2 O&M ESMP

Prior operation, an Operation Environmental and Social Management Plan (OESMP) will be prepared to ensure that the operation processes of the Masrik PV Power Plant Project are implemented in a manner which minimizes the environmental and social impacts associated with operation activities as specified by:

- Conditions mentioned in the environmental permit issued by Ministry of Environment (MoEnv) on July 17th, 2019 (attached in annex A);
- Commitments made in the project ESIA; and
- Commitments made by FRV to meet the Lenders requirements (please see section 3)..

This OESMP, in accordance with this ESMP, will allow the O&M contractor team to:

- Establish procedures and work practices that will mitigate environmental effects;
- Ensure that the project complies with all Armenian policies and standards for environmental protection;
- Implement an effective monitoring program that will provide “real time” information on ambient environmental conditions in the vicinity of the project;
- Regularly evaluate both the operation activities and the environmental monitoring data and make any operation activity changes required to ensure that environmental conditions remain at acceptable levels; and
- Maintain high levels of environmental awareness amongst the project team.

The OESMP is a project document – to be implemented by the O&M contractor, with input from FRV Masrik CJSC and its consultant. It therefore focuses on internal environmental management including internal communications and profile building.

Plan for external communications with the local community is presented through the Stakeholder Engagement Plan (SEP). If required, the OESMP could be used as a basis for information on environmental management of the construction activities, to be communicated to any interested external parties.

7.1.3 OCCUPATIONAL HEALTH AND SAFETY HAZARD IDENTIFICATION, RISK ASSESSMENT, AND RISK MANAGEMENT PLANNING

An Occupational Health and Safety Management plan including Community Health and Safety Plan will be developed and implemented by the EPC. This management plan will include dispositions for hazard identification, risk assessment and risk management planning.

7.1.4 TOPSOIL MANAGEMENT

A Construction ESMP plan will be developed and implemented by the EPC.

In case the topsoil stripping and temporary stockpiling cannot be done within the boundaries of the plots under the Developer control, these shall be implemented in accordance with the following procedure, if applicable:

- (i) Selection of the site and getting preliminary agreement with the head of community or with the owner;
- (ii) Obtaining the necessary approvals from head of community/ owner and from the relevant Marzpetaran (Regional Administration);
- (iii) Contractor implements the topsoil stripping and separates the topsoil material from the big size stones and rocks;
- (iv) By the end of site operation Contractor implements the "Site closure" procedure rehabilitates the site in accordance with procedure described in the ESMP and performs hand over to the community/owner;

7.1.5 SOIL EROSION PREVENTION AND SEDIMENT CONTROL

An Erosion and Sediment Control Management plan will be developed and implemented by the EPC.

Where any excavated bare soil slope exceeds 3m (measured vertically) soil erosion will generally become a problem. This is also determined by rainfall erosivity and in Armenia this is generally low.

Excavated areas will be evaluated (bare soils) for long length of slopes, if these exceed 3m vertical interval then measures may be required to control rainfall erosion. Compacted soils are the most susceptible to erosion. However, if bare soils are seriously compacted by vehicle movements then these may be somewhat stable but they will also be difficult to re-vegetate due to inhospitable conditions for root development.

Sites are unprotected whenever they are left bare – these sites are susceptible to the full rainfall erosivity force. Rainfall erosivity is reduced by developing a protective cover over bare soils. This is achieved by re-vegetation or the application of mulches or organic mats which intercept erosive rainfall before it hits bare soil surfaces and mobilises soil particles.

Contractor shall control and shall take the necessary measures to prevent soil erosion and to ensure slopes stability.

Contractor shall preserve existing soil layer where practicable.

Limit the size of the excavated area. This will reduce the area that is exposed and reduce length of slope.

Try and reduce length of slope so that this does not exceed 2 m VI. Where slopes are to be cut that will exceed 2m VI e.g. on batters consider benching the slopes so that the length of slope is broken up.

Consider reducing the slope of the batter to 1:3 (vertical: horizontal). Avoid vertical batters as these cannot be stabilised by re-vegetation.

If it is difficult to reduce the size of an excavated area, consider ways to reduce the catchment which will reduce runoff entering the area by constructing interception drains above the excavated area.

Always rehabilitate bare areas as quickly as possible to reduce the area that is exposed.

7.1.6 WASTE MANAGEMENT

A Waste Management Plan will be developed and implemented by the EPC.

The following types of waste shall be managed:

7.1.7 SOLID WASTE/ GARBAGE GENERATED BY CONTRACTOR

Contractor shall provide sufficient amount of bins or containers for collection of solid waste: off-cuts from metal and timber, concrete, paper, plastics, cardboard, cans and bottles, workshop waste and organic food waste and other garbage at all work sites (construction site and other specific sites used by the Contractor) and at the Contractor's facilities. Containers will have sufficient capacity to contain the expected waste for the period before they are next emptied. Any waste that does or is blown away from the containers will be picked up by the Contractor/sub-contractor. This type of waste shall be removed straightly to an authorized landfill

7.1.8 LIQUID WASTES

A Wastewater Management Plan will be developed and implemented by the EPC.

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.

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.

7.1.9 DANGEROUS MATERIAL AND WASTE

A Waste Management Plan and Hazardous materials management plan will be developed and implemented by the EPC.

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

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The dangerous material shall 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 the dangerous waste 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, contaminated area cleaned, and waste removed and disposed of according to procedures described by the legislation of RA.

7.1.10 HAZARDOUS MATERIALS AND WASTE

A Waste Management Plan and Hazardous materials management plan will be developed and implemented by the EPC.

Hazardous materials and waste include those that are (i) brought to site as part of the construction process (ii) those that may be generated during construction

Where Hazardous Chemicals materials are used on-site the Material Safety Data Sheet (MSDS) in the relevant languages will be attached to the container. All workers are to be familiar with the MSDS before using the material and will be provided with the appropriate protective safety clothing.

Fire extinguishers of CO2 or dry chemical will be provided where hazardous materials are stored or handled.

Main emphasize of the Contractor is to transport the hazardous waste to the specialized companies for secondary use.

7.1.11 DISPOSAL OF WASTES

A Waste Management Plan will be developed and implemented by the EPC.

Contractor shall implement the permanent disposal of generated waste in accordance with the following procedure:

- (i) Selection of the site and getting preliminary agreement with the head of community or with the owner;
- (ii) Obtaining the necessary approvals from head of community/ owner.
- (iii) By the end of site construction/operation Contractor/Operator implements the "Site closure" procedure: rehabilitates the site in accordance with ESMP and performs hand over to the community/owner;

Contractor shall avoid disposal of waste in any non-approved and non-permitted area.

Collected household waste (garbage) also will be removed to an authorized landfill designated by the Masrik community.

Hazardous wastes will be disposed of by an approved company licenced to deal with hazardous wastes. The Contractor will make arrangements for the disposal of hazardous wastes with the Ministry of Environment. Contractor shall apply to "Wastes Research Center"

State Non Commercial Organization (SNCO) of the MNP for hazardous waste passports and licenses of wastes when needed.

7.1.12 RECORD OF GENERATED WASTES

A Waste Management Plan will be developed and implemented by the EPC.

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. A suggested outline for the record is shown.

WASTE RECORD FOR MONTH of: Year:....

Highway Section:

Table 1: Waste generated for month

Type of waste	Waste generated (m ³)			Remarks
	Previous total	This month	New total	

Table 2.1: Waste Disposal Record for Dump Site

Approval to dumpm³

Type of waste	Waste disposed (m ³)			Remarks
	Previous total	This month	New total	

Table 2.2: Waste Disposal Record for Dump Site

Approval to dumpm³

Type of waste	Waste disposed (m ³)			Remarks
	Previous total	This month	New total	

Table 3: Hazardous Waste Disposal Record

Removed by Hazardous waste Contractor (name)

Contractor	Waste disposed (m ³)			Remarks
	Previous total	This month	New total	

7.1.13 SITE CLEARING, FLORA AND FAUNA

A Site clearing, Flora and Fauna Plan will be developed and implemented by the EPC.

The purpose of the Site Clearing, Flora and Fauna Plan (SCP) is to document the approach of the Contractor, and their workers to vegetation clearing activities during construction and minimize the impact on flora and fauna as well as to protect areas that contain known Red Book species and Red Book species that are encountered during construction.

Potential Negative Impacts on Flora and Fauna

- Disturbance and displacement of Red Book migratory species of birds;
- Unnecessary cutting/removal of trees and ground vegetation;
- Workers lack of understanding and care to protect the environment;
- The project can negatively affect fauna by:
 - destroying nesting places, burrows and holes of animals;
 - Killing animals during construction;
 - Directly interfering with their migrating and reproduction by:
 - Restricting access to habitats, noise, vibration, and air and water pollution.

Mitigation Measures

To prevent and mitigate possible negative impacts on flora and fauna it is important to implement the following mitigation measures:

1. Vegetation

- i. Show the location of areas of significant vegetation and the location of buffer zones which may be required around waterways.
- ii. Significant vegetation is identified and if possible, excluded from the area to be cleared.
- iii. Avoid as much as possible cutting of trees and bushes.
- iv. Vegetation removal and site clearing should be undertaken during late autumn and/or winter which are seasons most favorable to avoid impact to protected flora and fauna species.
- v. No clearance of vegetation other than that outlined within the plan.
- vi. Clearing boundaries are physically established and shown to operators
- vii. Explore alternatives to burning, to dispose of the material e.g. use for building materials, fuel wood or converting the vegetation to a vegetative mulch for use in re-vegetation via a machine chipper.
- viii. Vegetative material that cannot be removed must be allowed to dry so as to produce a "clean fire" with limited smoke.
- ix. Ensure that any burning is undertaken in calm conditions to avoid smoke being dispersed over a wide area.
- x. Before burning check, the wind conditions so that smoke from any fires does not aggravate surrounding communities.

2. Fauna

- xi. Avoid construction and blasting activities during animal's breeding period, etc(from April till June).
- xii. If Red Book nesting places, burrows, and holes of animals discovered, inform ES with recommendations for action.
- xiii. Reporting and contacting the ME in the case of an injured animal being found:

Government Bldg, Republic Sq, Yerevan, 0010, Armenia
Tel.:+374 11 818557, E-mail: minenv@env.am

7.1.13.1 OUTLINE FOR SITE CLEARING, FLORA AND FAUNA PLAN

The SCP is to outline the procedure that is required when sites require clearing of vegetation and the vegetation disposed of. The intention of the procedure is to define the limits of the area to be cleared to limit excessive clearing and to avoid clearing significant vegetation. Disposal of vegetation should consider possible ways of reusing the vegetation rather than disposing of it by burning it. Any burning must try and limit smoke particles. Burning needs to be considered with regard to the surrounding sensitive receptors to smoke i.e. those communities living within the proximity of the fires.

The SCP is to be attached to the Site Work Plan and consists of the following;

- i. Location of Red Book species to be shown on Site Section Map.
- ii. Trees located along the highway are to be shown on the Site Section Map
- iii. Trees to be cleared are identified on the Site Section Map
- iv. Clearing boundaries are shown on the map
- v. Trees to be cleared are to be identified in the field with high viz tape.

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- vi. Clearing boundaries are defined in the field so that machinery is contained with these areas.
- vii. Trees and vegetation to be cleared is pushed into heaps and offered to surrounding communities for removal.
- viii. Posters showing Red book flora and fauna species likely to be found in various areas of the project should be installed in work camps, etc.

7.1.14 SITE REINSTATEMENT, LANDSCAPING AND RE-VEGETATION

A Construction ESMP will be developed and implemented by the EPC.

The objective of the procedure is to ensure that sites are adequately protected during construction and stabilised after construction is completed.

Site Clean Up

At the completion of the project or when a site is completed the site is to be cleaned of all material and debris, the site levelled and all rocks and extraneous materials removed from the site so that the site is restored to as much as possible the original surface.

- All waste will be removed, and the surface levelled
- All machinery including unserviceable machinery and vehicles will be removed from the site.
- If not required by the owner or someone taking the site over:
- All temporary buildings and fencing will be removed.
- All temporary services will be removed.
- All fuel storage areas will need careful inspection and any contaminated soil removed and dumped.
- All access roads and vehicle parking areas will be ripped to remove compaction and rehabilitated to passable condition.
- The site will be landscaped to ensure that the area drains properly.
- The site will be re-vegetated as required.
- Contractor participates in IFC post-construction audit and completes the audit checklist.

7.1.15 DUST MANAGEMENT

A Dust management Plan will be developed and implemented by the EPC.

This Standard Operating Procedure establishes minimum requirements for the dust suppression. Ambient air quality is expected to be affected with the wind in period of construction. Indeed, the major sources of dust emissions during construction are: grading, and earthworks; loading/unloading, handling, transport of materials or wastes; and vehicle movements.

Site clearing, including demolition and excavation, as well as onsite storage of construction materials can result in significant quantities of dust

Applicable Legislation and Regulations – Dust and Air Quality

The measurements will be conducted in accordance with the most restrictive normative documentation applicable, which are IFC EHS Guideline (compared to Armenian regulation):

- GOST 17.2.4.05-83 «Atmosphere. Aspiration method of dust determination».
- Government Decree N160-N «Normative of threshold limit value (TLV) of atmospheric air pollutants in residential areas»
- IFC EHS Guideline

Name of substance	TLV (mg/m ³)	
	Averaging Period	Guideline value in mg/m ³
Particulate Matter PM ₁₀ (Dust)	24-hour	0.05
Particulate Matter PM ₂₅ (Dust)	24-hour	0.025

Table 4: IFC EHS Threshold limit value for dust

Monitoring of dust shall be conducted during the construction period on a monthly basis.

Dust Mitigation Measures in Construction Sites

Construction activities especially the operation of machinery and vehicles can create dusty conditions. Dust needs to be minimized so that there is no health risk or loss of amenity. Mitigation needs to be considered from the aspects of (a) dust generation sites and (b) dust suppression systems.

Mitigation measures include;

- i. Minimizing Dust generation
 - a. limiting the area opened
 - b. retaining vegetation
 - c. minimizing vehicle speeds, 30 km/h limit for access roads and construction site

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- d. ensure only designated access tracks are used for vehicles with no off-road driving
- e. progressive rehabilitation of disturbed areas
- f. secure vehicle loads and cover stockpiles

ii. Dust suppression methods include

Spraying water on susceptible areas

If significant volumes of dust are generated due to construction activities, increased mitigation and management measures will be undertaken including for example the use of misting sprays and water trucks for dust suppression.

Dust Mitigation - Stockpiles

Dust generation from stockpiles will be minimized using the following measures

- a. Stockpiles of topsoil or other material (if any) will be located as far as practicable from residential areas to minimize noise and dust.
- b. Water carts will be employed to adequately damped stockpiles to prevent the emissions of dust.
- c. Progressive re-vegetation will be undertaken of long-term stockpiles, using a suitable cover crop.
- d. Temporary stockpiles will be assessed for dust potential. If found to be a contributor to air quality issues, mitigations measures such as seeding with a suitable cover crop or watering down of areas will be implemented.

Dust Mitigation - Materials Haulage

Vehicle movements on unpaved roads in dry conditions can generate dust as well dust may be generated from unsecured fugitive loads being transported on haul vehicles.

The following measures will be implemented to reduce air quality impacts from haul vehicles:

- a. Construction workers will be made aware of their responsibilities to operate equipment so as to reduce dust levels.
- b. Measures will be put in place to minimize dust, soil or mud from being deposited from any vehicle on public roads. This will include vehicle grates, wash down facilities, enforce speed limits etc.
- c. All drivers of haul vehicles will be inducted to the workplace conditions and will be briefed on the Traffic Management.
- d. Drivers of construction vehicles will be briefed on these requirements at induction meetings held prior to any driver commencing work.
- e. Where feasible and practicable, restricted or limited/altered access and egress to and from site will be established after periods of substantial rainfall.

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- f. Spoil tracking and mud will be removed from public roads as quickly as possible so as not to jeopardize safety to the public or the Contractor's vehicles.
- g. Sweeping of sealed roads within the construction site will take place where required through the site foremen or directed by the superintendent.
- h. All construction vehicles that are hired by the Contractor will be provided with tarpaulins as standard equipment. The Contractor will reject any haul vehicles that are not equipped with tarpaulins or are ineffective. Tarpaulins will be used to cover any fugitive loads covered as to prevent any loss of material, whether in the form of dust, liquid or solids.
- i. Loads on all haul trucks will be covered and tailgates visually checked for effective sealing prior to the haul vehicle leaving the construction site.

Dust Mitigation - Contractor's Facilities

The following control measures will be implemented to minimize potential impacts on air quality as a result of activities at these locations:

- a. Dust suppression measures will be applied to access roads, construction camp areas and workshops. Heavy use areas will be sealed to minimize dust issues.
- b. Regular maintenance of filters will be undertaken.

7.1.16 NOISE POLLUTION MINIMIZATION

A Noise pollution minimization Plan will be developed and implemented by the EPC.

Applicable Legislation

Instrumental measurement, analysis and evaluation of results are carried out in accordance with the following regulations:

- GOST 12.1.050-86 "Methods of measurement of noise in the workplaces";
- Sanitary Norms №2-III-11.3 "Noise in the workplaces, in residential and public buildings and housing in construction areas" approved by the order of the RA Minister of Health №138 06.03.2002.
- Methodical Guidelines N4.3-001-07 "Guidelines for the instrumental measurements of noise in the workplaces, in residential and public buildings and housing in construction areas".
- As criteria for determination of the conformity level of the actual noise in buildings, the normative values of the equivalent (average) and maximum sound levels are used, according to the Sanitary Norm №2-III-11.3 "Noise in the workplaces, in residential and public buildings and housing in construction areas", approved by the order of the RA Minister of Health №138 06.03.2002.

№	Premises and territories	Noise level L(A) and noise equivalent levels L(Aeq.), db	Maximum noise levels L(Amax), db
1	Workplace	80	
2	Residential rooms in apartments, residential premises of holiday houses, guest houses, residential houses for the elderly and disabled people, sleeping premises in kindergartens and boarding schools	40	55

Table 5: Permissible noise levels

Mitigation of Noise

Noise results from the operation of machinery, vehicles and equipment. Noise must be minimized to reduce impacts on sensitive receptors. Sensitive noise receptors need to be identified and these include workers, surrounding communities and wildlife.

Construction noise levels at nearby receptors will vary throughout the construction period depending on the activities carried out, the distance to sensitive receptors, as well as atmospheric conditions. Without mitigation, increased noise levels may result in significant but temporary noise impacts.

Mitigation measures include;

- a. Minimize noise generation at source.
- b. Locate noisier activities away from sensitive receptors where practicable.
- c. Where sensitive receptors occur limit operation of noisy equipment to daylight hours
- d. In ecologically sensitive areas do not carry out noisy operations during breeding and nesting periods (from April till June).
- e. Minimize the need for heavy vehicles to pass through residential areas by specifying routes along public roads, site access points, and haul routes. Apply Traffic Management Plan to haul routes.
- f. Installing and maintaining effective exhaust silencing systems on vehicles and equipment to meet national noise standards.
- g. Installing temporary hoarding around noise sources if other mitigation measures are not sufficient or practicable.

7.1.17 VIBRATION CONTROL

A Noise pollution minimization Plan will be developed and implemented by the EPC. This plan will include dispositions for vibration control.

Applicable Legislation

Instrumental measurement, analysis and evaluation of results should be conducted in accordance with the following regulations/standards:

Hygienic Norms №2-III-11.3 "Vibration in the workplaces, in residential and public buildings",

Directive 2002/44/EC on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (vibration),

GOST 31191.1-2004 (ISO 2631-1) "Mechanical vibration and shock - Evaluation of human exposure to whole-body vibration - Part 1: General requirements",

GOST 31319-2006 (EN 14253) "Mechanical vibration. Measurement and assessment of occupational exposure to whole-body vibration with reference to health. Requirements for measurement at the workplace".

As criteria for determination of the conformity level of the actual vibration in sensitive areas, the normative values of vibration acceleration are used according to the Hygienic Norms №2.2.4-009-06 "Vibration in the workplaces, in residential and public buildings".

Mitigation of Vibration

Vibration occurs from the operation of machinery, vehicles and equipment. If vibratory rollers are to be used these will be a particular source of vibration and safe distances must be established between the machinery and the sensitive receptor. Sensitive receptors include workers, surrounding communities, buildings and wildlife. All sensitive receptors need to be identified at any work site.

Mitigation measures include:

Determine the zone of vibration influence for the particular type of machinery

Evaluate susceptible structures that may lie within this zone before the use of vibrating machinery.

Do not carry out activities within this zone if susceptible structures have been identified.

Be aware of possible compensation claims from residents if their buildings have been damaged. This is why it is important to evaluate and take photos of possibly susceptible buildings and structures before using this machinery. Complaint will be managed in accordance with disposition in the Grievance Redress Mechanism plan.

7.1.18 TRAFFIC MANAGEMENT

A Traffic Management Plan will be developed and implemented by the EPC.

The traffic management addresses the Traffic safety issues that will arise from the movement of trucks through construction site and entering or exiting the construction site.

Construction traffic will be organised not to interfere with public traffic.

Sufficient number of signs warning on the on- going civil works and regulating the traffic shall be installed in accordance with legislative standards.

A speed limit of 10 km/hr will be imposed at the site for safety and to reduce dust. All trucks entering or exiting the haul road from or to the highway will be regulated by a flagman.

The foreman and drivers will be trained on IFC safeguards and advised by the ESHS specialist that if any driver receives three warnings the driver will be dismissed.

All the trucks technical conditions shall be checked periodically, they shall have identification logs and all drivers will have their licenses checked and verified by the contractor's ESHS specialist before they are employed.

The trucks shall not be overloaded. All material on the trucks will be covered with tarpaulins or other relevant material while entering public roads to prevent fugitive materials from being dropped along the road. All truck trays and tail gates will be checked to ensure that material cannot fall out and be dropped along the road.

All material from haul truck tires will be removed before the haul truck enters the road. A water tanker will be located at the exit of the haul track for washing down truck tires if it will be necessary.

Contractor shall take all effective measures to prevent spread of mud into the public roads. All accesses to worksite shall be covered with gravel or other protective material. The tires of trucks shall be shoveled or otherwise cleaned before entering public roads.

At the completion of work any damage to the adjacent area (community roads, agricultural or other area) is to be repaired and the adjacent area reinstated to a condition that it was at the time of commencing road construction.

The Traffic Management Plan will provide procedures and dispositions on loading/unloading tasks.

7.1.19 ARCHAEOLOGICAL/CULTURAL HERITAGE CHANCE FINDS PROCEDURE

An Archaeological/Cultural Heritage Chance Finds procedure will be developed and implemented by the EPC.

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This procedure provides guidance on the actions that shall be taken by the staff who may encounter relics or artefacts with potential archaeological at any project sites.

Environmental and Social Impact Assessment (ESIA) studies indicates that although rare, some potential exists for certain types of archaeological finds to be encountered in the project area. There is an interest in preserving historical heritage, and it is requested to notify if archaeological deposits or potentially historic objects are discovered.

The purpose of this plan is to document the approach of the Contractor and their workers to protect identified archaeological, historical, and cultural sites and monuments close to the Project implementation area and to manage any physical cultural resources that are encountered during the construction works in accordance with Armenian legislative requirements on archaeological and cultural chance finds.

The Project will not be built in any cultural heritage or archaeological sites designated by UNESCO.

The following accidental discovery protocol will be completed by the contractor. If any potential cultural heritage or archaeological sites are identified:

- (i) Work that might adversely affect that site shall stop immediately;
- (ii) The site shall be reported to the Supervision Engineer and Ministry of Ministry of Education, Science, Culture and Sport;
- (iii) The area will be demarcated and MESCS will supervise investigation and carry out salvage operations.
- (iv) Such demarcated sites must be inspected to confirm no inadvertent or unreported damage. The frequency of this inspection shall be defined by the MESCS or Supervision Engineer upon need.

7.1.20 EMERGENCY PREPAREDNESS AND RESPONSE

An Emergency Preparedness and Response Management Plan will be developed and implemented by the EPC for the construction phase and it will be updated for the operation phase.

The Emergency Preparedness and Response will address the minimum safety requirements of IFC, 2007a and IFC, 2007b as well as appropriate GIIPs.

The Emergency Preparedness and Response 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.

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.
- TECHNOGENIC: 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 drawn 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
- 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.

Armenia Emergency Telephone Numbers

101 – Fire Service

102 – Police

103 – Ambulance

118 – Rescue Team

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 to mitigate effects and prevent escalation
- 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 about the accident / incident

Responsible on scene will immediately determine if required:

- a) First Aid to injured person
- 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 Supervision unit

Safety and Healthy 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 (RA law on Fire Security adopted on 2001 April 18, N 263 Order of Minister of Emergency Situations od RA on the Approval of the Fire Security Rules and best practice of international institutions).
- 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

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- 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.

- Firefighting 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 favorable report from the Firefighting 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.

7.1.20.1 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.

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



Figure 8: Map of the nearest hospital and police department (state fire security group is also located in the Vardenis city)

7.1.20.2 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

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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 hemorrhaging
- 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

7.2 UNDER THE RESPONSIBILITY OF FRV

7.2.1 CODE OF CONDUCT FOR EMPLOYEES AND CONTRACTORS

FRV will implement a Code of Conduct for employees and contractors for construction and operation activities. Any employees and contractors or subcontractors involved in those activities will have to comply with this Code of Conduct. The dispositions will be elaborated in that document which will be implemented prior any construction activities.

7.2.2 AVIFAUNA MONITORING PLAN

Prior any construction activities, FRV will develop and implement a bird mortality monitoring program to assess impacts of the Transmission line. If any bird species are found injured along the Transmission line during post construction monitoring, they will be transferred to a rehabilitation center for veterinarian care and potential re-release into the wild.

8 MONITORING AND REVIEW

8.1 ESMS RECORDS

Records generated as output from the implementation of the ESMS Plan and its supporting plans will be filed and maintained by administrative staff under the direction of the Environmental Manager. Records organization, retention, and storage and retrieval requirements, as well as access control and other requirements designed to preserve the accessibility and integrity of records will be done in accordance with the FRV Integrated Management System.

8.2 MONITORING AND MEASUREMENT

Monitoring is important to ensure that environmental impacts are prevented and mitigated by following the ESMP to ensure that sound engineering practices are followed for the protection of the people and environment. The Contractor has the responsibility to ensure the following:

- Implementation of impact prevention and mitigation measures and
- Compliance with the Contract Specifications and the ESMP.
- Report on findings with respect to impact prevention and mitigation and the actions recommended to problems encountered.

The critical component covered by the monitoring program refers to construction management since the key impacts are those generated during this phase of work. The monitoring plan is based on the mitigation/enhancement measures identified for the environmental impacts and those that are moderately significant but can have critical effects if not mitigated.

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What parameter is to be monitored	Why is parameter to be monitored	Where is the parameter to be monitored	When (or how often) is the parameter to be monitored	How is the parameter to be monitored	What is the cost of monitoring	Who is responsible for monitoring
Survey of Biodiversity of selected area	To avoid loss of species registered in the Red Book of Armenia	Area of Masrik 1 PV	Before construction works	Inspection of the report on preconstruction survey of PV Plant area	3,000USD	DC, Consultant, IA
		Corridor of OTL	Before the selection of the OTL corridor	Inspection of the report on preconstruction survey of OTL corridor	4,000USD	DC, Consultant, IA
Historical and cultural sites	To avoid damages of Historical and cultural monuments	Location of PV plant, towers and new access roads	Before construction works Before the selection of OTL corridor	Inspection of records	Included in design costs	DC, Consultant, IA
Quality of construction materials	Ensure reliability of construction materials and their safety for human health	In the provider's office or warehouse	During conclusion of supply contracts	Verification of documents	Including in construction costs	CC
Transportation of construction materials and waste	- Limit pollution of soil and air from emissions; - Limit nuisance to local communities from noise and vibration; - Minimize traffic disruption.	- Construction site - Routes of transportation of construction materials and wastes	Undeclared inspections during work hours and beyond	Inspection of roads adjacent to the construction object in the direction of the movement route Monitoring, on a weekly basis, noise emissions in accordance with Noise pollution minimization plan Monitoring grievances in relation to transport movements in accordance with Grievance Redress Mechanism plan	Including in construction costs	CC
Movement of construction machinery	- Avoid pollution of water and soil with oil products due to operation of equipment	Construction camp and temporary sites along of OTLs	During operation of equipment	Inspection of activities Monitoring water and soil quality in accordance with Waste Management plan and Erosion and Sediment Control Management plan	Including in construction costs	CC
Soil Erosion	To prevent further erosion	Side slopes and material storage sites	Weekly during construction works	Visual inspection of erosion prevention measures and occurrence of erosion	Including in construction costs	CC

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Soil Pollution	To minimize pollution of soil	At all construction sites, including construction camp, approach roads and OTL corridor	Weekly during construction works	Visual inspection	Including in construction costs	CC
	To prevent pollution of soil	Parking sites, approach roads and OTL corridor	Monthly during operation phase	Visual inspection	Included in operation costs	OC
Air Quality: dust, smoke	To minimize pollution of air	At all construction sites, including construction camp, approach roads and OTL corridor	Daily during construction works	Visual inspection Dust monitoring in accordance with Dust management plan	Included in operation costs	CC
Air Quality smoke	To minimize pollution of air	Parking sites, approach roads	Weekly during operation phase	Visual inspection	Included in operation costs	OC
Noise	To minimize level of noise	At all construction sites, including construction camp, approach roads and OTL corridor	Weekly during construction works	Sound meter	80USD	CC
Noise	To minimize level of noise	Parking sites, approach roads	Weekly	Sound meter	80USD	OC
Traffic Safety	To ensure safety of traffic	All common roads used by CC	Daily during construction works	Visual inspection	Included in the construction costs	CC
		All common roads used by CC	Weekly during construction works	Visual inspection	Included in operation costs	OC

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Generation of construction waste	Prevent pollution of soil, surface water and ground water, Avoid accidents at the construction site due to scattered fragments of construction materials and debris, Retain esthetic appearance of the construction site and its surroundings	Construction site; Waste disposal site	Periodically during construction and upon its completion	Inspection of construction camp and temporary sites	Included in the construction costs	CC
Generation of domestic wastes	Prevent pollution of soil, surface water and ground water	PV Plant site and surrounding area	Periodically during operation phase	Visual observation	Included in operation costs	OC
Construction site re-cultivation and landscaping	Reduce loss of aesthetical value of the landscape due to the PV Plant and OTLs construction	At all construction sites, including construction camp, approach roads and OTL corridor	Final period of construction	Visual inspection	Included in the construction costs	CC, Consultant, IA
Workers' health and safety	Reduce probability of traumas and accidents	At all construction sites	Total period of construction works	Inspection of activities Monitor / review incident reports and resultant actions in accordance with OHS Plan.	Included in construction costs	CC, IA
		PV plant	Total period of operation	Inspection of logs	Included in operation costs	OC, IA
Emergency preparedness	- Reduce risks for the construction workers	At all construction sites	Total period of construction works	Periodic check-ups Monitor / review incident reports and resultant actions in accordance with Emergency Preparedness and Response plan	Included in construction costs	CC, IA

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	-Reduce risks for the staff of the PV Plant - Avoid disruption in the maintenance of the PV Plant and OTLs	PV plant and OTLs	Total period of operation of the PV Plant	Periodic check-ups	Included in operation costs	OC, IA
Awareness of communities	Reduce risks for the Residents living near to construction sites	Local communities	Before construction works	Inspection of notification documents Interviews of Residents living near to construction site Monitor community grievances and resultant actions in accordance with the Grievance Redress Mechanism plan	Included in operation costs	CC, Consultant, IA
Employment	- Implementation of a non-discriminatory hiring and wage policy -Prioritization of employment of local people for construction works	- local communities - PV plant office	Regularly during construction	Interviews Monitor employees' grievances and resultant actions in accordance with the Grievance Redress Mechanism plan	Included in construction costs	CC, Consultant
Gender aspects	To ensure zero tolerance for sexual harassment at the work place or in workers' camps / overnight locations	- All construction sites; - PV Plant; - local communities	Monthly during construction phase Quarterly during operation phase	Interviews with women Inspection of complaints in accordance with the Grievance Redress Mechanism plan	Included in construction and operation costs	CC, OC, Consultant, IA
	To provide strengthen district administrations on gender issues (i.e. receive complaints by women)					
Grievance Redress Mechanism	To ensure implementation of GRM and its effectiveness	- local communities - PV plant office	Monthly	- Inspection of complaints - Interviews with employees - Interviews with Communities heads	Included in construction and operation costs	CC, OC, Consultant, IA

8.2.1 INSTRUMENTAL MONITORING

Contractor implements collection of baseline data for dust, noise, vibration and water quality and prepares a baseline report. Contractor implements the further regular (once per month) measurements of above environmental parameters and together with comparative analysis with baseline data and with Armenian legislative standards produces reports.

8.3 NON-CONFORMANCE REPORTING AND CORRECTIVE AND PREVENTIVE ACTION

All Project staff are responsible for bringing suspected non-conformances, spills or releases of potentially hazardous wastes or materials, or other existing or potential emergency situations to the immediate attention of their supervisor or the Environmental or OHS Managers for evaluation. In addition to the specific response actions that may be required by individual management/mitigation plans or the current Emergency Preparedness and Response Plan, such situations will be promptly evaluated, documented, and thoroughly investigated, and appropriate management actions will be taken in accordance with the corrective and preventive action processes.

Non-conformances are defined as conditions that FRV Masrik CJSC and EPC can control or substantially influence that:

- are contrary to FRV Masrik CJSC policy commitments;
- can be classified as accidents or significant near misses;
- violate a legal or regulatory requirement, or represent a worsening condition that could result in a violation if not corrected;
- could potentially result in negative environmental or social impacts to the Project; or
- represent a lack of conformance with this ESMP or its supporting management/mitigation plans.

If a non-conformance is judged to exist, Corrective/Preventive Action Requests (CPARs) will be initiated and tracked until closure. CPAR documents and tracking logs are considered to be ESMS performance records and will be maintained as described in Section 9.1.

8.4 INTERNAL ESMS AUDITS

Item No.	Performance Requirement	Score	Comments/ Issues	Actions Required	Review Update
PR1: Assessment and Management of Environmental and Social Impacts and Issues					
1.1	Environmental and Social Assessment	PC			
1.2	Environmental and Social Management Systems	FC			
1.4	Environmental and Social Management Plan (ESMP)	PC			
1.5	Organisational Capacity and Commitment				
1.6	Supply Chain Management	FC			
1.7	Project Monitoring and Reporting	PC			
PR2: Labour and Working Conditions					
2.1	Human Resource Policies and Working Relationships	PC			
2.2	Child and Forced Labour	PC			
2.3	Non-Discrimination and Equal Opportunity	PC			
2.4	Workers Organizations	PC			
2.5	Wages, benefits, and	PC			

Item No.	Performance Requirement	Score	Comments/ Issues	Actions Required	Review Update
	conditions of work and accommodation				
2.6	Retrenchment	PC			
2.7	Non-Employee Workers	PC			
2.8	Supply Chain	FC			
2.9	Security Personnel Requirements	PC			
PR3: Resource Efficiency and Pollution Prevention and Control					
3.1	Resource Efficiency	PC			
3.2	Pollution Prevention and Control – Air emissions	PC			
3.3	Pollution Prevention and Control – waste water	PC			
3.4	Greenhouse Gases	NO P			
3.5	Water	FC			
3.6	Wastes	PC			
3.7	Hazardous Substances and Materials Wastes	PC			
3.8	Noise	PC			
PR4: Health and Safety					
4.1	Occupational Health and Safety	FC			
4.2	Community Health and Safety	PC			

Item No.	Performance Requirement	Score	Comments/ Issues	Actions Required	Review Update
4.3	Infrastructure, Building, and Equipment Design and Safety	NO P			
4.4	Hazardous Materials Safety	PC			
4.5	Product and Services Safety	FC			
4.6	Traffic and Road Safety	FC			
4.7	Natural Hazards	FC			
4.8	Exposure to Disease	PC			
4.9	Emergency Preparedness and Response	FC			
PR5: Land Acquisition, Involuntary Resettlement and Economic Displacement					
5.1	Avoid or minimise displacement	FC			
5.2	Consultation	FC			
5.3	Grievance mechanism	PC			
PR6: Biodiversity Conservation and Sustainable Management of Living Natural Resources					
6.1	Assessment of Biodiversity and Living natural resources	PC			
6.2	Sustainable Management of Living Natural Resources	FC			
PR7: Indigenous Peoples					

Item No.	Performance Requirement	Score	Comments/ Issues	Actions Required	Review Update
No indigenous people have been identified within the Project's AoI and the LEA has not seen anything which would suggest otherwise. This PR is therefore considered not applicable.					
PR8: Cultural Heritage					
8.1	Assessment and Management of Impacts on Cultural Heritage	PC			
8.2	Project use of Cultural Heritage	FC			
PR9: Financial Intermediaries					
Not applicable to the Project.					
PR10: Information Disclosure and Stakeholder Engagement					
10.1	Stakeholder Engagement Plan	PC			
10.2	Operational Grievance	PC			
Overall Compliance					
	National Environmental, Social, Health and Safety Requirements	NO P			
	EU Environmental, Social, Health and Safety Requirements	PC			

9 STAKEHOLDER ENGAGEMENT

The Stakeholder Engagement Plan implemented by FRV as a standalone document outlines a systematic approach to stakeholder engagement that will help the Developer build and maintain over time a constructive relationship with their stakeholders, the locally affected

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communities. The SEP is a live document which will be updated throughout the Project construction, operation and implementation.

A Grievance Redress Mechanism, attached to the SEP, has been developed has a standalone document.

Objectives of the stakeholder engagement plan include:

- Identifying the main stakeholders of the project components and activities;
- Provide the opportunity for identified stakeholders to participate in the process of identifying any potential impacts and/or concerns;
- Identify those environmental and social impacts/concerns which are considered to be of key relevance and importance through a process of information disclosure and meaningful consultation as per IFC requirements;
- Ensure appropriate approach and adequate focus is adopted during the project implementation;
- Ensure that the identified stakeholders are appropriately engaged on issues that potentially affect them in addition to managing the Public Grievance mechanism that will be adopted by FRV MASRIK CJSC during the project implementation, especially during construction;
- Establish and maintain an ongoing relationship with the communities affected (positively or negatively) throughout the life of the project.
- Ensure that the community grievance mechanism is accessible;
- Establish, maintain, and improve the worker-management relationship through ensuring that the workers grievance mechanism is accessible, and workers/employees concerns are addressed in a timely manner.
- Engaging with existing workers and/or workers organisations whenever applicable in accordance with the Armenian Labour Law.

The IFC considers stakeholder engagement as an essential part of good business practice and a way of improving the quality of projects. As a result, the implementation of the proposed force main project should comply with the IFC requirements, specifically Performance Standard 1: Information Disclosure and Stakeholder Engagement and Armenian local laws and regulations. Stakeholder engagement will be an ongoing process throughout the project, in order to ensure transparency with all stakeholders that may be affected by, or have influence on, the project.

The relevant national and international applicable standards and guidelines within the context of the proposed force main project include, but are not limited to, the following:

IFC Environmental and Social Policy – Performance Requirement 1: Information Disclosure and Stakeholder Engagement including Grievance Redress Mechanism;

The Republic of Armenia Law on Environmental Assessment and Expertise of 2014;

Armenian Labour code adopted on 9 November 2004;

To fulfill IFC requirements, it is recommended that FRV MASRIK CJSC follows a stakeholder engagement process or procedures to ensure effective communication with internal and

external stakeholders and take them into consideration in the decision-making process and future planning.

Relevant Armenian Stakeholder Engagement Requirements & Legislation

Stakeholder engagement in Armenia is connected to the preparation of an Environmental and Social Impact Assessment (ESIA) and is a requirement of the “The Republic of Armenia Law on Environmental Assessment and Expertise of 2014”. For those projects which require an ESIA (as the case for this Project), the Regulation requires a scoping session with potentially affected stakeholders at the onset of the ESIA, to provide stakeholders with project information and allow them to participate in the ESIA process.

The Regulation specifies that the outcomes of the ESIA are to be announced to the public and stakeholders in a public hearing.

IFC and EBRD Requirements

The Developer will be seeking financing for the Project from International Financial Institutions (IFIs) – to include EBRD and IFC. Therefore, the Developer wishes to design and manage the project in accordance with good international industry practice and standards.

The IFC 2014 Environmental and Social Policy includes a comprehensive set of Performance Requirements (PRs) covering key areas of environmental and social impacts and issues. IFC’s PR1 sets out the following requirements of stakeholder engagement during project preparation:

- The first step in successful stakeholder engagement is for the client to identify the various individuals or groups who (i) are affected or likely to be affected (directly or indirectly) by the project (“affected parties”), or (ii) may have an interest in the project (“other interested parties”). Resources for public information and consultation should focus on affected parties, in the first instance.
- As part of the stakeholder identification process, the client will identify individuals and groups that may be differentially or disproportionately affected by the project because of their disadvantaged or vulnerable status. The client will also identify how stakeholders may be affected and the extent of the potential (actual or perceived) impacts. Where impacts are perceived, additional communication may be required to provide information and reassurance of the assessed level of impacts. An adequate level of detail must be included in the stakeholder identification and analysis to enable the Bank to determine the level of communication that is appropriate for the project under consideration. Employees are always considered stakeholders.
- The Client will inform the IFC how communication with the identified stakeholders will be handled throughout project preparation and implementation, including the type of grievance procedure envisaged.

9.1 DISCLOSURE OF INFORMATION

As noted in Section 10, the Stakeholder Engagement Plan will be updated prior to the start of construction that will incorporate the social management themes, including specific requirements for the disclosure of Project information.

9.2 INFORMED CONSULTATION AND PARTICIPATION

Pursuant to Stakeholder Engagement Plan requirements, community information and consultation meetings will be periodically conducted. Should either community information and consultation meetings or any community health and safety awareness meetings result in specific complaints or information requests, they will be documented and referred to management for follow-up in accordance with Grievance Mechanism redress plan, as appropriate for the circumstances.

10 EXTERNAL COMMUNICATIONS AND COMMUNITY GRIEVANCE MECHANISM

10.1 EXTERNAL COMMUNICATIONS

10.1.1 PROCEDURE FOR CONSULTATION MEETINGS

Pre-construction consultation meetings are to be arranged with the community including community representatives and members of the community to discuss the project. The intention of the consultation meeting is to forewarn the community of the likely changes in a timely manner so that they have time to adapt to the project impacts and prepare themselves proactively rather than reactively. The Contractor may also have time to consider, where possible, adapting traffic management plans to suit community needs. Grievance procedure may also be enacted during this stage.

The Contractor will be responsible for making the following arrangements.

1. The Contractor will prepare a list of affected villages or communities.
2. Contractor shall notify the mentioned Community leaders for a joint meeting, residents from the affected communities will be invited to a consultation meeting at least one week prior to the meeting. Each community will have its own meeting, which will be held in their community to discuss, among other things the Project itself, community safety issues, and the grievance redress procedure.
3. The Contractor will arrange the venue for the meetings. To be at a convenient time and location for local people to attend.
4. The information and consultation process will include and record the result of separate discussions with women and men.

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5. Following the meeting the Contractor 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 Contractor which includes presenting details of the construction and operation phases of the Project, 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 Contractor's response.
 - f. Any issues raised by participants which cannot be addressed by the Contractor and need to be forwarded to the SE.
 - g. Date of proposed collection of any written responses from the community.

10.2 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 presenters by Chairman.
2. The Contractor will present the following talks in Armenian.
 - a. Introduction to the Project;
 - b. Technical, social and environmental safeguard requirements of the Project.
 - c. Social Safeguards:
 - i. discussion about social safeguards, prevention of problems during the Project implementation- (issues like road and community safety and access to homes, fields, businesses etc.)

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- ii. forthcoming awareness raising campaign program about HIV/AIDS and trafficking prevention for male labour force and affected community members and local sex workers (if identified as working in the locality of the construction)
- d. Environmental Safeguards
 - i. Details of the ESMP to be applied during the Project implementation. Advice the community of sites which will be used for dumping waste and machinery/equipment storage requirements (if any).

Common to both the SS and 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 SE if the Contractor cannot resolve any issue.
- f. Details of the Grievance Redress Mechanism and lodgment of complaints.
- g. The traffic management and road safety issues to be applied during the construction.
- h. Specific safety designs/solutions during the operational stage (if any).
- i. Organization of archaeological works along (if any).
- j. Questions and answers, general discussion. The result of discussions with women's and men's groups will be recorded separately, and later translated into English for the monthly reports.
- k. Obtain contact details for key informants (female and male) head of communities to be used to arrange follow up meetings and to organize participation.

10.3 GRIEVANCE MECHANISM TO AFFECTED COMMUNITIES

A Grievance redress mechanism has been implemented. The procedure is disclosed as a standalone document translated in Armenian and attached to the Stakeholders Engagement Plan.

11 IMPLEMENTATION BUDGET

The preliminary costs for the ESMP measures under FRV responsibilities that would need to be updated as long as the Project's activities is:

Budget prior and during the construction period (2020-21): US\$ 10,000

Annual budget for the operation phase (>2022), for the first five years: US\$ 3,000

The preliminary budget required for the implementation of the measures under the responsibility of the EPC Contractor, included in the EPC costs: US\$10,000

ANNEX A: STATE EXAMINATION OPINION (CONCLUSION) ON ENVIRONMENTAL IMPACT EXAMINATION

I APPROVE
MINISTER OF ENVIRONMENT
E. GRIGORYAN
17.07.2019

/Official seal (Ministry of Environment of the Republic of Armenia)/

STATE EXAMINATION OPINION (CONCLUSION)
ON ENVIRONMENTAL IMPACT EXAMINATION
BP 000061

INITIATOR: "FRV MASRIK" CJSC
Adonts 10, Yerevan

ACTIVITY: "Masrik 1" Solar Power Plant Environmental Impact Expertise Report
Gegharkunik marz

"Environmental Impact Expertise Center" SNCO Acting Director /signed/ A. DRNOYAN
/Official seal (RA Yerevan "Environmental Impact Expertise" SNCO)/

STATE EXAMINATION OPINION (CONCLUSION)
ON ENVIRONMENTAL IMPACT EXAMINATION EXPERTISE

Number BP 000061

17.07.2019

“Masrik 1” Solar Power Plant Environmental Impact Expertise Report

Initiator: “FRV MASRIK” CJSC

Submitted materials: Environmental Impact Expertise Report and attached documents

Activity category: “A”

Installation location: Mets Masrik and Geghamasar communities of Gegharkunik marz

The area requested for Masrik 1 Solar Power Plant is located in Gegharkunik marz, Lake Sevan inshore Masrik lowland, in the territory of Mets Masrik and /Solar Power Plant/ and Geghamasar /Overhead Line/ communities. The distance from the existing settlements is: from Mets Masrik – 4.2km, from Pokr Masrik – 3.35km, from Norakert – 4.5km, from Arpunk – 6.95km, from town Vardenis – 5.2km and from shore of Lake Sevan – 7.2km.

The planned Masrik 1 PV Power Plant alternating current power is planned to be 55.0 MW, peak power – 62.013MW, Power Plant area - 128.3ha and fence length – 5870m.

The 110kV high voltage overhead line of 9.2 km length will be constructed: OL from Masrik 1 PV substation to “Kaputak” and “Akunk” overhead communication lines anchor bases. The connections are planned to the bases №452 of “Kaputak” and №86 of “Akunk”, which are located in the area of Geghamasar community. It is planned to install 41 bases, including 13 anchor bases.

The Photovoltaic Power Plant system consists of Inverter Transformer Centers (ITC). This production units consist of parallel and consequent units of a number of photovoltaic modules, which in turn are located in on stationery constructions of horizontal PV modules.

ITC consists of distribution equipment of the following capacity: 1 input distribution network, 1 output distribution network and 1 protective distribution network.

In the Connection Center (CC), there are the following devices: network distribution protective switching equipment. The Connection Center – with licensed and accredited measuring devices, connecting to the distribution devices will measure the supplied power. The auxiliary power transformer will supply the necessary power from the Connection Center to the CC equipment (auxiliary services, illumination, power supply system, etc.), as well as warehouse equipment, where the spare parts are stored.

The parallel connection of the PV modules line will be made in constant current junction boxes. In that junction box, there will be an installed fuse (fuses and excess-voltage fuse), as well as a line switch.

The solar modules will be mounted on special carriers. It is planned to have 2953 carriers, with number of bases for each carrier to be 5 and number of modules on each carrier to be 56 pieces.

The constant current received from the solar panels will be transformed with a number of alternating current transformers (invertors), which in turn will be connected to the medium voltage transformer, making the average voltage network. A medium voltage network will be connected to the substation in the power plant area, where the voltage value will increase up to 110kV, in order to be connected to the ENA (Electric Networks of Armenia).

In the area of Solar Power Plant, it is planned to build 33/110kV voltage substation.

In the PV substation, 12 medium voltage transformers will be installed: 6 substations of 5MVA and 6 substations of 5.1MVA type.

Transformers will have secondary pair of packages, in order to optimize the interconnection with two invertors. These will be very low loss transformers (1%). Those transformers with invertors and auxiliary power transformers will be installed in the preliminary prepared galvanized steel sheet constructions (container type).

The plant grounding system, main auxiliary services powered from medium voltage auxiliary power transformers, are envisaged. The main auxiliary services are illumination, sockets, fire protection, safety, control system. ITCs will also consume the power supplied from the auxiliary medium voltage power transformer, installed inside each ITC. It will reduce output voltage of invertors, bringing it to the low voltage for the following auxiliary services: invertors power supply, cooling systems power supply, illumination, sockets, fire alarm devices.

The monitoring system for the tracking of plant operation is envisaged. It is also planned to have a perimeter road to connect during the main blocks operation and maintenance. There will be an access to each ITC through the internal roads. The road drainage system will be designed based on hydrological surveys and drainage system planned for the Plant. The roads will have relevant transversal slopes for drainage to minimize water penetration into the pavements and other road surfaces. To minimize the negative impacts of surface water flows, it is planned to build the perimeter moat, boundary gorges, curbs and gutters, or the combination of all these drainage systems. The roads design will be made in a way to provide comfortable and safe movement of vehicles.

It is planned to have a parking space for 15 vehicles, envisaged to be located in the vicinity of Management Center.

All the elements of photovoltaic modules support structures (pillars, pipes, bars and levers) will be fastened by bolts.

The main structure will consist of base pillars and bars, two base pillars will make one auxiliary/brace/base block.

Three types of bases are envisaged for the installation of props.

A fence of 2m height will be installed with barbwire conducted over it for security reasons. On each 15m, including on twisted parts, there will be main steel pillars installed at appropriate places. The steel pillars shall be properly fastened to the ground for the sustainable fence operation. The overall fence length will be 5870m.

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During the solar panels' installation, it is planned to remove only the topsoil remaining under the construction bases, with its capacity being 70cm.

The topsoil under the carriers and of the roads will be stored at the edge of the Solar Power Plant area, in the specially equipped storage and will be used in future for the land improvement.

The topsoil under the Overhead Lines support bases will also be cut and removed; it will be temporarily stored near the support's bases, and immediately after construction of bases will be used for the improvement of bases platforms.

The volume of soil removed during the Solar Power Plant construction will be 14950 cubic meters, during the OL construction it will be 5624.2 cubic meters, overall – 20575.2 cubic meters.

During the construction phase, the demand for technical water will be met through the tankers, and the drinking water will be supplied with 20 liter containers with the appropriate suppliers of Mets Masrik community.

The sanitary water at construction site will be stored in designated tanks. Water with special water trucks will be transported from Mets Masrik community.

Before the operation phase, it is planned to build biological treatment plant for wastewater treatment in the structure of administrative building. It is planned to install the cell-modular container treatment plant – of BMOS or equivalent type, of 5m³/day capacity.

When planning the PV Power Plant and OL corridors, there will be solid and liquid wastes: used engine oils, 0.2t, used tires, 0.4t/year that will be stored in concrete covered area till their delivery to the licensed companies; construction wastes – 8-10 cubic meters that will be transported to the landfill designated by the Community Administration.

Wastes for further storage and processing will be provided to the relevant licensed companies.

Designated area with concrete platform and runoff collection system will be provided for the fuel storage. The fuel tank volume will be 100l.

In the adjacent territories of the planned activity there are no specially protected nature areas.

No flora and fauna species registered in the Red Book of Armenia were detected in the area; no immovable monuments of history and culture registered in the area.

According to the design documents, the environmental protection measures are envisaged.

During the planned activity, the potential adverse environmental impacts are envisaged to be during the construction phase; they will be temporary, conditioned by the duration of construction period and will be local, covering mainly the Solar Power Plant construction area.

During the construction works, there will be a pollution of air basin, temporary emissions of inorganic dust, as well as emissions of vehicles with diesel engine.

During the construction works, water will mainly be used for construction site watering, cleaning and some works, as well as for household purposes.

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Conclusion

To prevent and mitigate the adverse environmental impact during the works planned under the submitted initial assessment application, the sufficient measures were designed to minimize the impact on ambient air, land resources and water resources.

The main impact of the planned activity is conditioned by the construction phase, which is insignificant and temporary.

Thus, the potential impact on all environmental elements does not exceed the permitted norms.

Armenia Renewable Resources and Energy Efficiency Fund is carrying out additional biodiversity field surveys, the main objective of which is to study the biodiversity of the territory, specifically to receive comprehensive data on the areas involved in the "Emerald" ecological network.

According to the procedure established by the Legislation, public consultations were held, during which the Local Self-Governing Bodies and public agreed on the project implementation. The Ministry of Environment subdivisions, Legal Advisor of the Ministry of Environment Coordinator of the Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat, NAS Lake Protection Sevan Expertise Committee and Sevan National Park SNCO, participated in the expertise process. In the expertise process, changes were made in the ESIA Report, as well as suggestions and comments were taken into account.

Expertise requirements

- Upon completion of Armenia Renewable Resources and Energy Efficiency Fund carried out additional biodiversity field surveys, they shall be submitted to the Ministry of Environment. If the areas allocated for the planned activity and the "Emerald" ecological network covered areas coincide, no works shall be conducted in the mentioned areas.
- During the construction and operation of the planned activity, the environmental components /land resources, biodiversity, etc./ periodical monitoring shall be conducted, post-design analysis plan developed, being accessible for State stakeholders and public. Additional activities for environmental impact minimization and prevention shall be envisaged, if necessary.

Opinion

Positive Opinion is given on the "Masrik 1" Solar Power Plant Environmental Impact Assessment Report submitted by "FRV Masrik" CJSC, with condition of mandatory implementation of the abovementioned environmental requirements.

Chief Specialist /signed/ Z. Zurnachyan

/Official seal (RA, Yerevan, Environmental Impact Expertise Center SNCO, Commission of Experts)/