# Environmental and Social Impact Assessment for a 200 MWac / 260 MWp Solar Power Project in Mhasale Village, Dhule District, Maharashtra

Final Report - Volume 5
Environmental and Social Management Plan

PREPARED FOR

AMPYR Renewable Energy Resources Twelve Private Limited

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## ACRONYMS AND ABBREVIATIONS

| Acronyms | Description |
|---|---|
| AC | Alternate Current |
| ADB | Asian Development Bank |
| AGM | Assistant General Manager |
| AGP | AGP Group |
| AoI | Area of Influence |
| ASHA | Accredited Social Health Activist |
| ATS | Applicant Tracking System |
| AWEA | American Wind Energy Association |
| AMPYR | Ampyr Renewable Energy Resources 12 Pvt. Ltd. |
| AMSL | Above Mean Sea Level |
| BMTPC | Building Materials and Technology Promotion Council |
| CBIP | Central Board of Irrigation and Power |
| Ceq | Carbon equivalent |
| CEO | Chief Executive Officer |
| CFM | Climate Fund Managers |
| CFO | Chief Financial Officer |
| CI1 | Climate Investors One |
| CGWA | Central Groundwater Authority |
| CGWB | Central Groundwater Board |
| CLO | Community Liaison Officer |
| CMS | Conservation of Migratory Species |
| $CO_2$ | Carbon dioxide |
| COO | Chief Operating Officer |
| CPCB | Central Pollution Control Board |
| CPR | Common Property Resources |
| CR | Critically Endangered |
| CS | Company Secretary |
| CTE | Consent to Establish |
| CTO | Consent to Operate |
| dB(A) | A-weighted decibel |
| DG | Diesel Generator |
| E&S | Environmental and Social |
| EBA | Endemic Bird Areas |

| Acronyms | Description |
|---|---|
| EBRD | European Bank for Reconstruction and Development |
| EC | Environment Clearance |
| EHS | Environmental Health and Safety |
| EIA | Environment Impact Assessment |
| EMF | Electromagnetic field |
| EN | Endangered |
| EPC | Engineering, Procurement and Construction |
| EPR | Extended Producer Responsibility |
| ESG | Environment, Sustainability and Governance |
| ESIA | Environmental and Social Impact Assessment |
| ESMP | Environmental and Social Management Plan |
| ESMS | Environmental and Social Management Systems |
| FGD | Focused Group Discussion |
| FPIC | Free, Prior, and Informed Consent |
| GAP | Gender Action Plan |
| GCF | Green Climate Fund |
| GHG | Green House Gases |
| GIAP | Gender Integration Action Plan |
| GIS | Geographical Information System |
| GM | General Manager |
| GRM | Grievance Redressal Mechanism |
| GSS | Grid Sub-Station |
| GW | Giga Watts |
| HSE | Health Safety Environment |
| HSSE | Health Safety Security Environment |
| Ha | Hectare |
| IAEA | International Atomic Energy Agency |
| IBA | Important Bird Areas |
| ICP | Informed Consultation and Participation |
| IFC | International Finance Corporation |
| ILO | International Labour Organisation |
| INR | Indian Rupee |
| IREA | International Renewable Energy Agency |
| IRENA | The International Renewable Energy Agency’s |
| IS | Indian Standards |

| Acronyms | Description |
|---|---|
| IUCN | International Union for the Conservation of Nature |
| KL | Kilo Liter |
| kV | Kilovolt |
| kWh | Kilowatt hour |
| LC | Least Concern |
| LNG | Liquified Natural Gas |
| LRP | Livelihood Restoration Plan |
| MAHAGENCO | Maharashtra State Power Generation Corporation Limited |
| MEDA | Maharashtra Energy Development Agency |
| MoEFCC | Ministry of Environment Forest and Climate Change |
| MoTA | Ministry of Tribal Affairs |
| MoU | Memorandum of Understanding |
| MPCB | Maharashtra Pollution Control Board |
| MSIHC | Manufacture, storage and import of hazardous chemicals |
| MSETCL | Maharashtra State Electricity Transmission Company Limited |
| MWp | Mega Watt Peak |
| NA | Non-Agricultural |
| NABL | National Accreditation Board for Testing and Calibration Laboratories |
| NFPA | National Fire Protection Authority |
| NOC | No Objection Consent |
| NTS | Non-technical Summary |
| O&M | Operation and Maintenance |
| OBC | Other Backward Class |
| PCC | Pollution Control Committee |
| PESA | The Provisions of the Panchayats (Extension to Scheduled Areas) |
| PPE | Personal Protective Equipment |
| PPP | Public Private Partnership |
| PR | Performance Requirements |
| PS | Performance Standard |
| PSS | Pooling Sub Station |
| PUC | Pollution Under Control |
| PV | Photovoltaic |
| RAP | Resettlement Action Plan |
| RF | Reserved Forests |
| RGO | Renewable Generation Obligation |

| Acronyms | Description |
|---|---|
| RIC | Responsible Investment Code |
| RoW | Right of Way |
| SC | Scheduled Caste |
| SCADA | Supervisory Control and Data Acquisition |
| SEIAA | State Environmental Impact Assessment Authority |
| SEP-GRM | Stakeholder Engagement Plan and External Grievance Redressal Mechanism |
| SoI | Survey of India |
| SPCB | State Pollution Control Board |
| SPV | Special Purpose Vehicle |
| ST | Scheduled Tribe |
| STC | Standard Test Conditions |
| TL | Transmission Line |
| ToR | Terms of Reference |
| TSDF | Transportation, Storage and Disposal facility |
| UN | United Nations |
| UNESCO | United Nations Educational, Scientific and Cultural Organization |
| VU | Vulnerable |
| WB | World Bank |

# 1. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

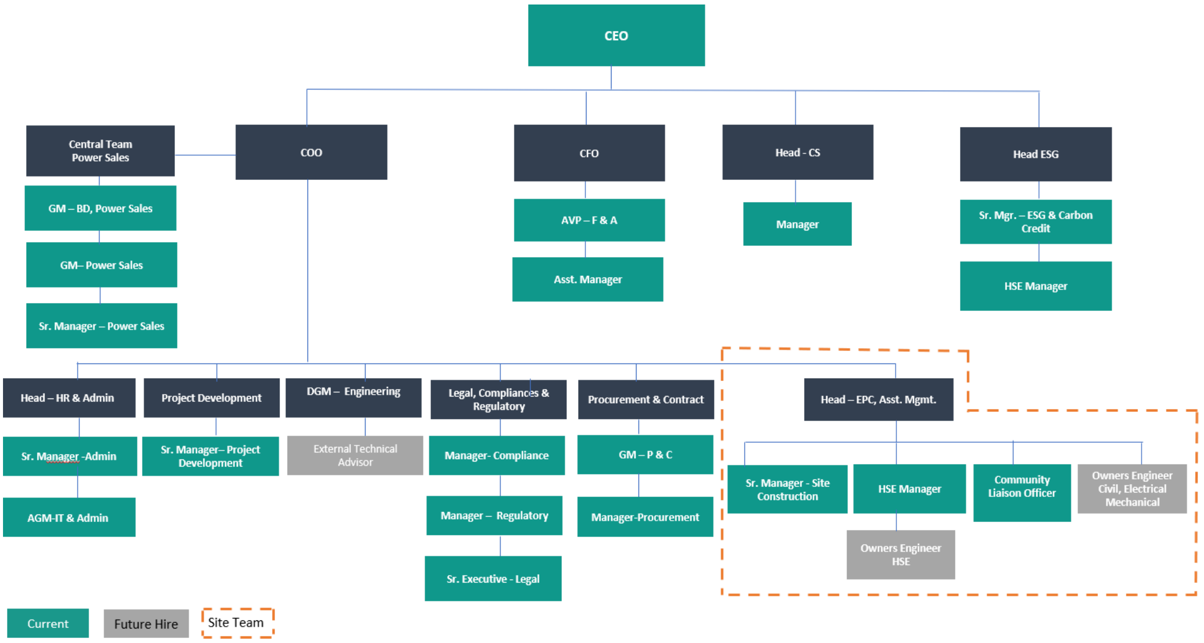
This *section* presents the Environmental and Social Management Plan (ESMP) for the 200 MWac / 260p solar Project and to be developed into four phases of 50MWac/65 MWp each. The purpose of this ESMP is to specify the standards and controls required to manage and monitor environmental ecological and social impacts during different phase of project life cycle, i.e. construction, operation and decommissioning phases. To achieve this, the ESMP identifies potential impacts from the planned activities and outlines mitigation measures required to reduce the likely negative effects on the physical, natural and social environment. This is in accordance to IFC Performance Standards 1 that emphasizes the importance of managing social and environmental performance through the lifecycle of the Project.

## 1.1 ORGANIZATION STRUCTURE

AMPYR is the Project company, which was set up in 2023 for implementation of the Project.

To ensure the efficiency of ESMP, certain institutional mechanisms with well-defined roles and responsibilities are essential for effective implementation of identified mitigation measures during construction, operation and decommissioning phases. Site level organization structure for construction and operation phase is as presented below:

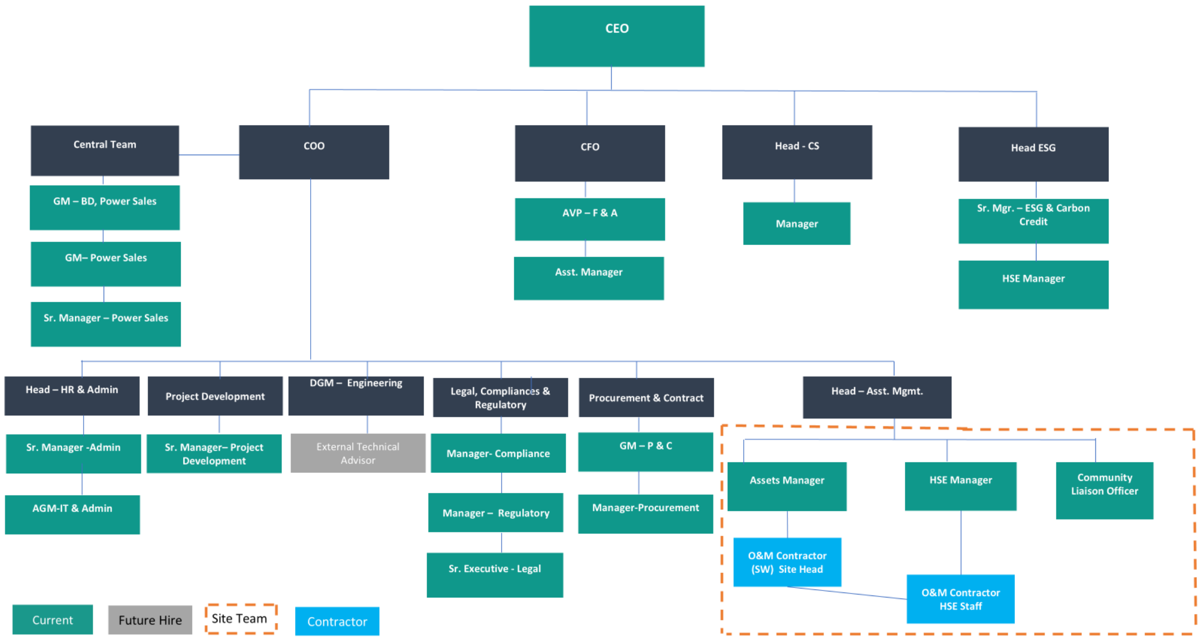
FIGURE 1.1 ORGANIZATION STRUCTURE – CONSTRUCTION PHASE




Operation phase HSSE&S management will be undertaken by the O&M contractor, who will have designated personnel for HSSE&S management. The management systems, implementation and periodic monitoring will be undertaken by AMPYR's HSSE Manager.

### FIGURE 1.2 ORGANIZATION STRUCTURE – OPERATION PHASE

**Project Level O&M Organization Chart**




## 1.2 IMPLEMENTATION OF ESMP

AMPYR will have ultimate responsibility for implementing the provisions of the ESMP. This role will include the on-going management of environmental, ecological and social impacts, monitoring of contractor performance as well as development of mechanisms for dealing with environmental, ecological and social problems. AMPYR will also ensure that the activities of its contractors (during construction, operation and decommissioning phases) are conducted in accordance with good practice measures, implementation of which will be required through contractual documentation.

The overall management and coordination of the Project will be the responsibility of Project Manager of AMPYR. AMPYR will engage an EPC contractor for construction activities including installation of solar modules, site office, etc. At the project level, implementation of management plans and corrective actions are the responsibilities of the EPC Contractor. In construction, operational and decommissioning phase, HSSE Manager of AMPYR/ Project Manager will oversee the Contractor HSSE Engineer's performance to implement the management action plans.

## 1.3 HEALTH, SAFETY, SOCIAL AND ENVIRONMENT DEPARTMENT (HSSE DEPARTMENT)

The AMPYR Energy and AMPYR HSSE department shall be responsible for the monitoring of the implementation of the various actions, which are to be executed by the agencies specified in the ESMP.

In general, the HSSE department shall perform the following activities:

- Preparation of required documents on environmental and social management;

- Ensuring availability of resources and appropriate institutional arrangements for implementation of ESMP;
- Implementation of the health and safety measures;
- Collection of the statistics of health of workers;
- Providing support during routine medical check-ups of workers;
- Awareness and implementing safety programmes;
- Providing job specific induction training;
- Compliance of regulatory requirements;
- Carrying out HSSE audits;
- Identify unsafe acts and conditions and suggest remedies;
- Develop safety culture and comply with company's HSSE policy and standard requirements;
- Encourage and enforce the use of PPE's;
- Educate all employees for the use of PPE's and safe practices;
- Direct, coordinate and orient the safety activities;
- Promulgate the spread of policy, objectives, rules and/or regulations;
- Perform a thorough investigation of all accidents and review the recommendations to avoid any repetition;
- Monitoring the progress of implementation of ESMP; and
- Reviewing and updating the ESMP and other technical management plans as and when required for its effective implementation.

## 1.4 INSPECTION, MONITORING AND AUDIT

Inspection and monitoring of the environmental impacts of the Project activities will increase the effectiveness of ESMP. Through the process of inspection and auditing, AMPYR will ensure that the conditions stipulated in various permits are complied with. The inspections and audits will be done by EPC contractor (during construction phase), trained team of AMPYR's HSSE department subject to be reviewed and conducted by external agencies/experts. The entire process of inspections and audits should be documented. The inspection and audit findings are to be implemented by the Project Manager.

## 1.5 REPORTING AND DOCUMENTATION

AMPYR will develop and implement a programme of regular reporting through the stages of the project lifecycle. The personnel delegated HSSE roles shall be required to fully comply with the monitoring programme in terms of timely submissions of reports as per acceptable level of detail. Reporting will be done in form of HSSE checklist, incident record register, training records, and environmental and social performance reports (weekly, monthly, quarterly, half yearly, yearly etc.).

## 1.6 INTERNAL REPORTING AND COMMUNICATION

Internally, the personnel delegated HSSE roles will share inspection and audit findings with their suggested measures regularly to the senior management for their consideration. The same are also to be communicated within the staff working on the Project. To maintain an open communication between the staff and management on HSSE and social issues the followings are being used:

- Team Briefings,
- On-site work group meetings; and
- Work Specific Instructions.

## 1.7 DOCUMENTATION

Documentation is an important step in the implementation of the ESMP. AMPYR will establish a documentation and record keeping system and ensure recording and updating of documents as discussed in the ESMP. Responsibilities have to be assigned to relevant personnel for ensuring that the ESMP documentation system will be maintained and that document control will be ensured through access by and distribution to, identified personnel in form of the following:

- Environmental and Social Management System;
- Legal Register;
- Operation control procedures;
- Work instructions;
- Incident reports;
- Emergency preparedness and response procedures;
- Training records;
- Monitoring reports;
- Auditing reports; and
- Complaints register and issues attended/closed.

## 1.8 ESMP REVIEW AND AMENDMENTS

The ESMP acts as an environment and social management tool which needs to be periodically reviewed to address changes in the organization, process or regulatory requirements and also based on evolving site conditions.

As the part of this ESIA, specific subject-matter technical management plans have been developed. Details of the management plan is in *Volume 6: Technical Management Plans.* The technical management plans should also be periodically reviewed and amended, based on the changing requirement.

Following a review, Project Manager in coordination with delegated HSSE personnel will be responsible for making the amendments in the ESMP and seeking approval from the designated approval authority. The amended ESMP will be communicated to all the staff on the Project.

## 1.9 TRAINING PROGRAMME AND CAPACITY BUILDING

Training is needed for effective implementation of ESMP. The training programme will ensure that all concerned members of the team understand the following aspects:

- Purpose of management plan for the Project activities;
- Requirements of the management plan and specific action plans;
- Understanding the sensitive environmental and social features within and surrounding the Project areas; and
- Aware of the potential risks from the Project activities.

HSSE Manager of AMPYR will ensure that environmental, health and safety induction training and job specific trainings are identified and given to the concerned personnel for construction activities and operation of the solar power plant.

In addition, general environmental awareness will be increased among the Project's team to encourage the implementation of environmentally sound practices and compliance requirements of the Project activities. This will help in minimising adverse environmental impacts, compliance with the applicable regulations and standards, and achieving performance beyond compliance. The same level of awareness and commitment will be imparted to the contractors and sub-contractors prior to the commencement of the Project.

### 1.9.1 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

This section outlines the potential impacts, mitigation measures, monitoring and management responsibilities during construction, operation and decommissioning phases of the Project.

The purpose of ESMP is to:

- Provide an institutional mechanism with well-defined roles and responsibilities for ensuring that measures identified in ESIA designated to mitigation potentially adverse impacts are implemented;
- List all suggested mitigation measures and control technologies, safeguards identified through the ESIA process;
- Provide Project monitoring program for effective implementation of the mitigation measures and ascertain efficacy of the environmental management and risk control systems in place; and
- Assist in ensuring compliance with all relevant legislations at local, state and national level for the Project.

In order to minimize potential impacts during the different phases of the Project lifecycle, mitigation measures, monitoring plan and responsibilities for its implementation are given in Tables below. The responsibility for implementation of ESMP will primarily lie with the HSSE department of EPC Contractor under the supervision of HSSE head of AMPYR.

The ESMP incorporating recommendations from the subject-matter technical management plans has been provided in ***Table 1.1***, ***Table 1.2*** and ***Table 1.3*** for the construction, operation and decommissioning phases respectively

TABLE 1.1 ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN (PLANNING PHASE)

| S. No. | Project Activities | Impacts/ Issue | Mitigation Measures | Responsibility for ensuring implementation of the suggested mitigation | Means of Verification that mitigation has been met | Timelines / Frequency of Monitoring | Responsibility for implementation of monitoring | Reporting Requirements |
|---|---|---|---|---|---|---|---|---|
| **Impact on Land Sellers (titleholders)** | | | | | | | | |
| 1. | Sale of land by landowners for the Project | Reduction of landholding for the landowners and loss of land-based livelihoods. | • The aggregators should assess the extent of land that will be left with the landowners after the land take for the Project footprint, and whether it will be adequate to pursue their current land based livelihood. Land purchase from marginal farmers (households owning less than one hectare) and small farmers (households owning less than two hectares) should be avoided;<br>• Avoid all irrigated and cultivated land parcels and households with small and/or marginal land holdings;<br>• If such households (those who are small and marginal farmers) cannot be avoided, the Project should provide assistance in adopting non-farm livelihoods such as owning and running small businesses etc. through focused intervention activities. In order to ease the process of transition from farm based to non-farm livelihood, opportunities should be identified, and linkage should be created for such households to adopt non-farm occupations; and<br>• Fixed assets like wells, structures present on the land parcels that are being purchased needs to be compensated at full replacement cost.;<br>• Ensure the inclusion of members of land selling households in community development initiatives such as skill building, entrepreneurship support etc.<br>• AMPYR to offer financial literacy training to all persons in receipt of payments for land selling. | Project Manager/Site Manager AMPYR/EPC Site Manager and HSSE personnel | • Documentation of land sale transaction records and any grievances received;<br>• Documentation of livelihood enhancement measures planned and undertaken | The proposed activities to be considered upon commencing any construction work | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Monthly Progress Report |

| S. No. | Project Activities | Impacts/ Issue | Mitigation Measures | Responsibility for ensuring implementation of the suggested mitigation | Means of Verification that mitigation has been met | Timelines / Frequency of Monitoring | Responsibility for implementation of monitoring | Reporting Requirements |
|---|---|---|---|---|---|---|---|---|
| **Impact on Land Lessors (non-titleholders)** | | | | | | | | |
| 2. | Sale of land by landowners for the Project | Functional reduction of landholding for the landowners and loss of land-based livelihoods. | • The Project should assess the extent of land that will be left with the landowners after the land take for the Project footprint and whether it will be adequate to pursue their current land-based livelihood. Land lease from marginal farmers (households owning less than one hectare) and small farmers (households owning less than two hectares) shall be avoided;<br>• Where possible all irrigated and cultivated land parcels and households with small and/or marginal land holdings should be avoided;<br>• Fixed assets like wells, structures present on the land parcels that are being leased to be compensated at full replacement cost;<br>• Prioritise the inclusion of members of land leasing households in community development initiatives such as skill building, entrepreneurship support etc; and<br>• AMPYR to offer financial literacy training to all persons in receipt of payments for land lease. | Project Manager/Site Manager AMPYR/EPC Site Manager and HSSE personnel | • Documentation of land lease transaction records and grievances received;<br>• Documentation of livelihood enhancement measures planned and undertaken | The proposed activities to be considered upon commencing any construction work | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Monthly Progress Report |
| **Impact on Landowners due to Transmission Line RoW and Tower Footprint** | | | | | | | | |
| 3. | Impact on Landowners under Transmission Line RoW and Tower Footprint | Restriction on Land Use and Diminution of Land Value | • There are no residential structures within the transmission line RoW. Non-residential structures that are within the RoW area should be avoided and transmission line routes should be altered in such cases.<br>• Compensation for land within the tower footprint as per the Ministry of Power Guidelines.<br>• No land to be permanently acquired for the casting of tower foundations and erection of towers.<br>• Prior intimation should be given to the landowners. Necessary witness should be obtained from the Revenue Officials along with owners' signature for acceptance | Project Manager/Site Manager AMPYR/EPC Site Manager and HSSE personnel | • Documentation of land transaction/ compensation records and grievances received; | The proposed activities to be considered upon commencing any construction work | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Monthly Progress Report |

| S. No. | Project Activities | Impacts/ Issue | Mitigation Measures | Responsibility for ensuring implementation of the suggested mitigation | Means of Verification that mitigation has been met | Timelines / Frequency of Monitoring | Responsibility for implementation of monitoring | Reporting Requirements |
|---|---|---|---|---|---|---|---|---|
| | | | of number and descriptions of the trees to be cut within RoW and tower base area. | | | | | |
| **Impact on Land Users** | | | | | | | | |
| 4. | Impact on Non-title holders | Involuntary economic displacement | • Prepare a Livelihood Restoration Plan (LRP) targeting the non-title holders. The LRP should assess the number of affected people (men and women)[1] the extent of the impacts, availability of alternatives and the extent of interim support required to help restore incomes and livelihoods. The LRP should also focus on the landless households impacted by the Project to assess the extent of impacts and support required for them;<br>• Provide financial literacy training as part of the Livelihood Restoration Plan;<br>• The GRM of the Project should be disclosed and made accessible to not just the land owners but also to the non-title holders and the larger community. Engagement activities, grievances received and actions taken must be documented | Project Manager/Site Manager AMPYR/EPC Site Manager and HSSE personnel | • Documentation of livelihood enhancement measures planned and undertaken<br>• Documentation grievances received from non-titleholders | The proposed activities to be considered upon commencing any construction work | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Monthly Progress Report |
| **Gender Differentiated Impacts** | | | | | | | | |
| 5. | Impact on women title and non-title holders | Gender differentiated impacts like not being able to participate in the negotiations | • For ongoing land acquisition process beyond the initial 65 MWp, verification needs to be undertaken towards the end of the land purchase process to assess whether the process has been undertaken transparently and fairly especially focusing on women title holders who are joint and sole owners to obtain assurance that safeguards have been implemented as per AMPYR's land processes.<br>• The entire negotiation process and compensation amount should be specifically explained to the women members in the family, be they owners or non-owners with the involvement of the consultant. | Project Manager/Site Manager AMPYR/EPC Site Manager and HSSE personnel | • Documentation of livelihood enhancement measures planned and undertaken<br>• Documentation grievances received from non-titleholders | The proposed activities to be considered upon commencing any construction work | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Monthly Progress Report |

[1] ERM estimates 80 – 100 non-titleholders which will be impacted (this is taking into consideration the area, no. of workers as per census 2011, and assuming labourers working on multiple farms)

| S. No. | Project Activities | Impacts/ Issue | Mitigation Measures | Responsibility for ensuring implementation of the suggested mitigation | Means of Verification that mitigation has been met | Timelines / Frequency of Monitoring | Responsibility for implementation of monitoring | Reporting Requirements |
|---|---|---|---|---|---|---|---|---|
| | | | • Household level financial literacy training and joint consultations between male and female members in the family can be undertaken at the time of sale deed signing with the help of a local NGO to develop a plan on utilization of the amount received. | | | | | |
| **Impact on Scheduled Tribes** | | | | | | | | |
| 6. | Impact on Scheduled Tribes | Impact of land purchase project on ST labourers | • Provision of preference for employment during the construction phase of the Project to the agricultural labourers particularly belonging to vulnerable groups like ST along with landowning households;<br>• The LRP prepared for the non-title holders should focus on labourers from the ST community in Mhasale; and<br>• Provide financial literacy training as part of the LRP | Project Manager/Site Manager AMPYR/EPC Site Manager and HSSE personnel | • Documentation of livelihood enhancement measures planned and undertaken<br>• Documentation grievances received from ST labourers | The proposed activities to be considered upon commencing any construction work | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Monthly Progress Report |

## TABLE 1.2 ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN (CONSTRUCTION PHASE)

| S. No. | Project Activities | Impacts/ Issue | Mitigation Measures | Responsibility for ensuring implementation of the suggested mitigation | Means of Verification that mitigation has been met | Timelines / Frequency of Monitoring | Responsibility for implementation of monitoring | Reporting Requirements |
|---|---|---|---|---|---|---|---|---|
| **Impact on land use** | | | | | | | | |
| 1 | • Developing and strengthening of internal access roads<br>• Installation of PV modules;<br>• Erection of transmission towers<br>• Establishment and operation of temporary structures such as temporary site office (porta cabin), labour camps and store yard | Permanent and temporary changes in land use | • Construction activity to be restricted to designated area<br>• On completion of the construction activities, land used for temporary facilities to be restored to the extent possible and handed over to the owners<br>• The land use around the permanent Project facilities is not to be disturbed | Project Manager/ Site Manager AMPYR/ EPC Site Manager and HSSE personnel | Site Inspection | Once; upon completion of construction work of each Project component | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Monthly Progress Report (Sample E&S reporting format given in Appendix A) |
| **Impact on topography and drainage** | | | | | | | | |
| 2 | Site levelling activities | Change in topography & drainage | • Project shall ensure to avoid changes in the topography by unnecessary clearing of land and levelling, especially during the preconstruction and construction phase<br>• In case of unseasonal showers during the construction phase, the EPC Contractor will halt construction activities till the rain stops<br>• The Project to develop a storm water drainage system, to ensure that water collected in the site flows out the site through said drainage system constructed within the plant boundary<br>• The Project may also choose to construct a rainwater harvesting pit to collect rainwater and release said rainwater through the aforementioned storm water drainage system constructed within the plant boundary<br>• Existing wells should be used as rainwater harvesting structure | Project Manager/Site Manager AMPYR/EPC Site Manager and HSSE personnel | Site inspection | Weekly Monitoring | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Monthly Progress Report |
| **Impact on land and soil environment** | | | | | | | | |
| 3 | • Construction and strengthening of internal access roads;<br>• Erection of transmission towers; | Soil compaction and Soil Erosion | • The topsoil present in the construction shall be removed and stock piled in separate area and to be reused during restoration | Project Manager/ Site Manager AMPYR/ EPC Site Manager and HSSE personnel | Site Inspection | Weekly Monitoring | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Monthly Progress Report |

| S. No. | Project Activities | Impacts/ Issue | Mitigation Measures | Responsibility for ensuring implementation of the suggested mitigation | Means of Verification that mitigation has been met | Timelines / Frequency of Monitoring | Responsibility for implementation of monitoring | Reporting Requirements |
|---|---|---|---|---|---|---|---|---|
| | • Selective clearing of vegetation in areas designated for installation of PV modules and other surface infrastructure;<br>• Stripping and stockpiling of soil layers;<br>• Heavy vehicle movement across unpaved roads;<br>• Storage of materials as well as transport of construction material; and<br>• General building/construction activities with regards to the site office<br>• Establishment of labour camps (If required) | | after removal of temporary facilities;<br>• The stock pile to be protected from natural elements to prevent from erosion and also degradation;<br>• Defined routes for transportation and construction vehicles, workers etc. to minimize soil compaction;<br>• Good drainage as per the natural slope condition to be provided to reduce surface runoff and associated erosion:<br>• Back filling and revegetation of the area disturbed to be undertaken phase wise immediately after the completion; and<br>• Site clearance, piling, excavation and internal access road construction not to be carried out during the monsoon season to minimize erosion and run-off.<br>• Clearance of vegetation especially soil-stabilizing floral species will be avoided to the extent possible during site clearance to retain the soil properties of the area;<br>• Material will be placed properly at construction site, thereby reducing disturbance to surrounding standing crop and vegetation; | | | | | |
| 4 | • Improper management of solid wastes;<br>• Improper management of hazardous waste;<br>• Impacts due to leaks and spills | Soil Contamination | • Designated areas to be provided for Municipal Solid Waste (MSW) and daily collection and periodic disposal to be ensured<br>• Construction and Demolition Waste to be stored separately and be periodically collected by an authorized treatment and storage facility<br>• All waste to be stored in a shed that is protected from the elements (wind, rain, storms, etc.) and away from natural drainage channels<br>• EPC/decommissioning contractor should ensure that | Project Manager/Site Manager AMPYR/EPC Site Manager and HSSE personnel | Site Inspection, Record Keeping and Training Records | Weekly Monitoring | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Monthly Progress Report |

| S. No. | Project Activities | Impacts/ Issue | Mitigation Measures | Responsibility for ensuring implementation of the suggested mitigation | Means of Verification that mitigation has been met | Timelines / Frequency of Monitoring | Responsibility for implementation of monitoring | Reporting Requirements |
|---|---|---|---|---|---|---|---|---|
| | | | no unauthorized dumping of used oil and other hazardous waste is undertaken at the site<br>• A log book to be maintained for quantity and type of hazardous waste generated<br>• In case of accidental/unintended spillage, the contaminated soil to be immediately collected and stored as hazardous waste<br>• Ensure hazardous waste containers are properly labelled and stored onsite provided with impervious surface, shed and secondary containment system awaiting handling and disposal by an authorised vendor (authorised by the MPCB and as per the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, as amended)<br>• It is to be ensured that hazardous waste is not stored for more than 90 days<br>• E waste, used discarded batteries to be disposed of in accordance to e-waste management rules and batteries management and handling rules<br>• Use of spill control kits to contain and clean minor spills and leaks<br>• The sewage generated onsite will be treated and disposed through septic tanks and soak pits as per specifications given in IS 2470: 1995 (Part I and II)<br>• Transport vehicles and equipment to undergo regular maintenance to avoid any oil leakages<br>• Unloading and loading protocols to be prepared for diesel, oil and used oil respectively and workers trained to prevent /contain spills and leaks | | | | | |

| S. No. | Project Activities | Impacts/ Issue | Mitigation Measures | Responsibility for ensuring implementation of the suggested mitigation | Means of Verification that mitigation has been met | Timelines / Frequency of Monitoring | Responsibility for implementation of monitoring | Reporting Requirements |
|---|---|---|---|---|---|---|---|---|
| | | | • Contractor to provide a detailed waste management plan (including authorised vendors, disposal locations) before starting work;<br>• The Project site is covered to the partially with cultivation/ crops. As per the criteria mentioned above soil quality is assessed to be medium. However, any soil contamination due to oil spillage to be localized immediately contained without any delay. Contaminated soil to be removed and disposed of appropriately. The Used Oil/grease from machineries shall be collected, stored and disposed to Authorised recycler as per Hazardous Waste Management Rules, 2016 and its amendments. | | | | | |
| **Impact on water resources** | | | | | | | | |
| 5 | ▪Construction of solar project; and<br>▪Domestic water for site staff and workers. | Stress on Water Availability | • Construction labour deputed onsite to be sensitised about water conservation and encouraged for optimal use of water<br>• Wells present within the site should be protected through barricading;<br>• Wells also should be used as recharging structure;<br>• Dumping waste or construction material within wells should be avoided;<br>• Alternate sources of water supply to be evaluated and ground water abstraction to be minimized to the extent possible<br>• Regular inspection for identification of water leakages and preventing wastage of water from water supply tankers is necessary for efficient utilisation of water;<br>• Blending of low quality water with fresh water for construction uses to ensure efficient use of natural | Project Manager/Site Manager AMPYR/ EPC Site Manager and HSSE personnel | Site Inspection, Record Keeping and Training Records | Weekly Monitoring | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Monthly Progress Report |

| S. No. | Project Activities | Impacts/ Issue | Mitigation Measures | Responsibility for ensuring implementation of the suggested mitigation | Means of Verification that mitigation has been met | Timelines / Frequency of Monitoring | Responsibility for implementation of monitoring | Reporting Requirements |
|---|---|---|---|---|---|---|---|---|
| | | | resource (if any treated water available from nearest city or town);<br>• Groundwater recharge measures to be undertaken in the form rainwater harvesting through recharge pits; and<br>• Recycling/reusing to the extent possible. | | | | | |
| 6 | ▪Improper management of wastewater<br>▪Accidental spills/leaks/leaching of contaminants into groundwater layers from storage areas of the Project<br>▪Construction and demolition activities that causes dust and erosion. | Water contamination | • Ensure proper cover and stacking of loose construction material at site to prevent surface runoff and contamination of receiving water body<br>• Provision of toilets across easily accessible locations at the Project site<br>• Open defecation and random disposal of sewage to be strictly restricted<br>• Planning of toilets, soak pits and septic tanks, waste collection areas away from natural drainage channels<br>• Use of licensed contractors for management and disposal of waste and sludge<br>• Labourers to be given training towards proactive use of designated areas/bins for waste disposal and encouraged for use of toilets<br>• Provision for impervious storage area, especially for fuel & lubricant, hazardous waste, etc. will be made onsite<br>• Spill/ leakage clearance plan to be adopted for immediate cleaning of spills and leakages | Project Manager/Site Manager AMPYR/EPC Site Manager and HSSE personnel | Site Inspection, Record Keeping and Training Records | Weekly Monitoring | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Monthly Progress Report |
| **Impact on air environment** | | | | | | | | |
| 7 | • Site clearing, excavation work, material handling<br>• Internal access road construction, strengthening and maintenance;<br>• Construction of ancillary facilities;<br>• Operation of D.G. sets; and<br>• Vehicular movement. | Particulate, fugitive and vehicular emissions | • Preventive measures such as storage of construction material in sheds, covering of construction materials during transportation will be undertaken, for reducing dust as part of the embedded controls; | Project Manager/Site Manager AMPYR/EPC Site Manager and HSSE personnel | Site Inspection and Record Keeping | Weekly Monitoring | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Monthly Progress Report |

| S. No. | Project Activities | Impacts/ Issue | Mitigation Measures | Responsibility for ensuring implementation of the suggested mitigation | Means of Verification that mitigation has been met | Timelines / Frequency of Monitoring | Responsibility for implementation of monitoring | Reporting Requirements |
|---|---|---|---|---|---|---|---|---|
| | | | • The construction site to be barricaded;<br>• Keeping areas of open excavation to a minimum;<br>• Minimize stockpiling by coordinating excavations, spreading, re-grading and compaction activities;<br>• Speed of vehicles on site to be limited to 10-15 kmph which will help in minimizing fugitive dust emissions due to vehicular movement;<br>• Emissions from the D.G. set and other stationary machines to be controlled by ensuring that the engines are always properly tuned and maintained;<br>• D.G. sets to be provided with adequate stack height;<br>• Cease or phase down work if excess fugitive dust is observed. Investigate the source of dust and ensure proper suppression measures;<br>• Proper maintenance of engines and use of vehicles with Pollution Under Control (PUC) Certificate; and<br>• Idling of vehicles and equipment will be prevented<br>• Sprinkling of water at regular intervals during high fugitive dust emission;<br>• Ensuring regular engagement with communities near to the Project site to address their concerns. | | | | | |
| **Impact on ambient noise environment** | | | | | | | | |
| 8 | • Noise from construction activities;<br>• Operation of D.G. sets; and<br>• Vehicular movement | Increased noise levels | • Only well-maintained equipment to be operated on-site;<br>• If it is noticed that any particular equipment is generating too much noise then lubricating moving parts, tightening loose parts and replacing worn out components to be carried out to bring down the noise;<br>• Machinery and construction equipment that may be in | Project Manager/Site Manager AMPYR/EPC Site Manager and HSSE personnel | Site Inspection and record keeping | Monthly baseline Monitoring and site inspection may be on daily basis covering different components | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Monthly Progress Report |

| S. No. | Project Activities | Impacts/ Issue | Mitigation Measures | Responsibility for ensuring implementation of the suggested mitigation | Means of Verification that mitigation has been met | Timelines / Frequency of Monitoring | Responsibility for implementation of monitoring | Reporting Requirements |
|---|---|---|---|---|---|---|---|---|
| | | | intermittent use to be shut down or throttled down during non-work periods;<br>• Low noise equipment to be used as far as practicable;<br>• The number of equipment operating simultaneously to be reduced as far as practicable;<br>• DG set with acoustic enclosures to be used;<br>• Vehicular movement through village roads to be planned to avoid traffic jam and inconvenience to local residents;<br>• Equipment noise to be 85 dB (A) at 1 m from the source in line with WB/IFC HSSE guidelines;<br>• Minimal use of vehicle horns needs to be encouraged;<br>• Limit construction related activities to day time in order to restrict the noise related nuisance in the evenings, where permissible noise threshold is lesser;<br>• All equipment use during construction and demolition work to be carried out during daytime hours (6:00 am to 10:00 pm as per CPCB limits);<br>• Noise monitoring to be undertaken periodically during the construction phase at any receptors or in the direction of receptors; and<br>• Vehicles and equipment used for the Project to be well maintained and oiled to prevent excess noise during construction.<br>• Ensuring regular engagement with the nearby communities;<br>• Noise monitoring should be undertaken periodically (monthly) during the construction phase at any receptors or in the direction of receptors | | | | | |
| **Impact on occupational health and safety** | | | | | | | | |

| S. No. | Project Activities | Impacts/ Issue | Mitigation Measures | Responsibility for ensuring implementation of the suggested mitigation | Means of Verification that mitigation has been met | Timelines / Frequency of Monitoring | Responsibility for implementation of monitoring | Reporting Requirements |
|---|---|---|---|---|---|---|---|---|
| 9 | Construction activities including installation of PV modules and other associated infrastructure involving working on height, use of crane and other mechanical lifting equipment; working on live wires; slip and trip hazard especially during monsoon season | Threat to Health and Safety of the construction workers and site personnel | • Oversight of AMPYR is required for safe operations by the EPC contractor during all phases of the Project;<br>• Health & safety induction training to be provided to all the workers during construction<br>• Prior to start of work, workers to be informed about the related safety risks and precautions to be taken through tool box meetings<br>• Adequate PPEs to be provided for all activities at site including for welding, cutting or similar operations which may cause hazard to eyes<br>• All persons performing construction work to wear safety shoes and helmets confirming to national standard<br>• Every worker engaged in handling sharp objects which may cause injury to hand to be provided suitable hand gloves<br>• While working in hot conditions, measures such as work break at regular intervals, keeping hydrated by drinking water and liquids, covering face with damp cloth etc. shall be used<br>• Trained workers to be involved in the specific work activities such as tower erection and stringing<br>• Manual lifting by adult men to be less than 55 kg and for women it is to be less than 30 kg<br>• Erection of steel structures to be carried out by experienced workers and they are to use safety harness, lifelines, catchment etc<br>• Obtain and check contractor's safety method statements<br>• Monitor health and safety performance and have an operating audit system | Project Manager/Site Manager AMPYR/EPC Site Manager and HSSE personnel | Site Inspection | Weekly Monitoring | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Monthly Progress Report |

| S. No. | Project Activities | Impacts/ Issue | Mitigation Measures | Responsibility for ensuring implementation of the suggested mitigation | Means of Verification that mitigation has been met | Timelines / Frequency of Monitoring | Responsibility for implementation of monitoring | Reporting Requirements |
|---|---|---|---|---|---|---|---|---|
| | | | • Permitting system to be implemented to ensure that cranes and lifting equipment is operated by trained and authorized persons only<br>• Appropriate safety harnesses and lowering/raising tools to be used for working at heights<br>• All equipment to be turned off and checked when not in use<br>• Emergency contact numbers and route to the nearest hospital to be displayed at the construction site<br>• Site specific safety or emergency response plan should be in place to account for natural disasters, accidents and any emergency situations<br>• Site specific/ activity specific Hazards Identification and Risk Assessment (HIRA) to be developed prior to start of the activities at site<br>• Provide H&S achievement information to employees<br>• Safe drinking water supply to be provided for the workers<br>• Excavated areas to be temporarily fenced to avoid access to outsiders and wildlife<br>• Security to be deputed at potential accident sites to restrict entry and prevent near miss or fatal incidents<br>• An up-to-date first aid box as per checklist (inventory & expiry date) to be provided at construction and a trained person to be appointed to manage it<br>• All equipment to be turned off and checked when not in use<br>• The local/ host community to be kept at safe distance from construction site<br>• At a minimum, implement all COVID-19 related safety and emergency response measures, as relevant and as | | | | | |

| S. No. | Project Activities | Impacts/ Issue | Mitigation Measures | Responsibility for ensuring implementation of the suggested mitigation | Means of Verification that mitigation has been met | Timelines / Frequency of Monitoring | Responsibility for implementation of monitoring | Reporting Requirements |
|---|---|---|---|---|---|---|---|---|
| | | | prescribed by the government | | | | | |
| **Community Health and Safety Impacts** | | | | | | | | |
| 12 | Construction phase activities such as the transportation of machinery, solar panels etc. could lead to risks and impacts to community health and safety | Impact on community health and safety | • There is no typical set back distance for solar Projects. However, the distance from the Project boundary to the settlements is above 100 m which is an adequate buffer distance for fire safety. Further, the internal access roads within the Project boundary will also add to the setback distance from the solar plant area. Initial barrier is the Project boundary wall and in addition the area between the plant boundary and the settlement has vegetation patches which also acts as barrier.<br>• As discussed in **Section 1.3.12.2** (Volume 4: Impact Assessment), a Project specific Health and Safety Management Plan will be put in place;<br>• Motor Vehicle (amendment) Act, 2019 should be strictly followed at site.<br>• Only the designated access road will be used for transporting panels and other components for the solar plant;<br>• No hazardous waste or any waste be stored within the site for long periods of time and be in contact with the soil in order to prevent against ground water contamination.<br>• The truck drivers carrying construction machinery and materials will be instructed to drive within speed limits with careful consideration for village traffic;<br>• Movement of heavy equipment and construction materials will be regulated during the day time and hours of peak road usage (09:00 AM to 06:00 PM) | Project Manager/Site Manager AMPYR/EPC Site Manager and HSSE personnel | Physical inspection and grievance records | The proposed activities to be considered upon commencing any construction work and continue to occur monthly | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Monthly Progress Report |

| S. No. | Project Activities | Impacts/ Issue | Mitigation Measures | Responsibility for ensuring implementation of the suggested mitigation | Means of Verification that mitigation has been met | Timelines / Frequency of Monitoring | Responsibility for implementation of monitoring | Reporting Requirements |
|---|---|---|---|---|---|---|---|---|
| | | | Mitigation Measures along Transmission Line during Construction Phase<br>• Risks to general public during operation will be reduced by public awareness and education and physical measures by attaching an appropriate warning sign on all faces of the tower;<br>• Once the stringing work is complete, notices and permanent anti climbing devices to be installed on the tower. The operational start date for electricity transmission and safety implications to be publicized locally in advance.<br>• The SOP for preventive maintenance and repairing of fault to be defined and followed;<br>• Fire-fighting measures to be maintained at substation;<br>• Provide the local community an understanding of the Project activities and the potential H&S risks and the grievance redressal mechanism as part of the stakeholder engagement process; | | | | | |
| **Local employment** | | | | | | | | |
| 13 | Enhancement measures for the local community through economic opportunities during construction phase | Economy and Employment – Positive Impact | It is understood that employment opportunities will be greater during the construction phase than the operations phase. The opportunities during the operations phase could be limited to housekeeping or security personnel. As the impacts of the Project on the local economy and employment is positive, the following measures have been recommended to further enhance the positive impact:<br>• Sourcing local labour wherever possible should be made obligatory for the sub-contractors and in all major | Project Manager/Site Manager AMPYR/EPC Site Manager and HSSE personnel | • Record of employment provided to members of land selling households and land users like agricultural labourers currently working on their land<br>• Records of grievances raised by contractual workers or the local community regarding the project and/or its activities | The proposed activities to be considered upon commencing any construction work | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Monthly Progress Update |

| S. No. | Project Activities | Impacts/ Issue | Mitigation Measures | Responsibility for ensuring implementation of the suggested mitigation | Means of Verification that mitigation has been met | Timelines / Frequency of Monitoring | Responsibility for implementation of monitoring | Reporting Requirements |
|---|---|---|---|---|---|---|---|---|
| | | | procurement activities. AMPYR should establish a mechanism to audit subcontractors and suppliers with respect to compliance of utilizing local labour and resources;<br>• A preference will be given to young adults/ children of landowners from Mhasale.<br>• It should be clearly communicated to the workers during the construction period that the employment will be short-term and the duration should be communicated upfront;<br>• Information on local employment should be communicated to the Gram Panchayats and information on availability of employment opportunities should be displayed at the Gram Panchayat office (in the local language) in consultation with the Sarpanch; and<br>• The Grievance Redressal Mechanism of the Project should be applicable to the contractual workforce engaged throughout the Project lifecycle. | | | | | |
| **Impact due to Labour influx** | | | | | | | | |
| 14 | Influx of migrant workforce during the construction phase | Limited opportunity for local workers | The recommended mitigation/ management measures to address the impacts related to migrant labours should include:<br>• Measures to ensure that the worker accommodation during the construction phase is not located in close proximity to settlements and if they are, then controls for hygiene will have to be put in place;<br>• Ensure that most of the labor requirements are sourced from the neighboring villages for unskilled work;<br>• Extending provisions for hygiene at Work Site, in | Project Manager/Site Manager AMPYR/EPC Site Manager and HSSE personnel | • Health and Safety Audits of contractors<br>• Physical Inspection | Monthly | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Monthly Progress Report |

| S. No. | Project Activities | Impacts/ Issue | Mitigation Measures | Responsibility for ensuring implementation of the suggested mitigation | Means of Verification that mitigation has been met | Timelines / Frequency of Monitoring | Responsibility for implementation of monitoring | Reporting Requirements |
|---|---|---|---|---|---|---|---|---|
| | | | terms of adequate lighting, sanitation facilities, proper drinking water facilities and monitoring of drinking water quality, proper disposal of waste, etc.; and<br>• Access to healthcare services and emergency medical care.<br>The following approach should be adopted to handle the issues of worker's accommodation that might arise and dealt step-by-step in following manner:<br>• Assessment of the type and number of workers who will be requiring accommodation facility;<br>• Identify applicable regulatory requirements on establishment of workers' accommodation; and<br>• Determining the standards to apply to the location of facilities, the construction of housing and provision of facilities. | | | | | |
| **Gender Differentiated Impacts** | | | | | | | | |
| 15 | Impact on local women | Impact on local women due to labour influx during construction phase | • Mandatory and repeated training and awareness raising for the workforce about refraining from unacceptable conduct toward local community members, specifically women;<br>• Informing workers about national laws that make sexual harassment and gender-based violence a punishable offence which is prosecuted;<br>• Introducing a Worker Code of Conduct as part of the employment contract, and including sanctions for non-compliance (e.g., termination, and adequate monitoring of contractors, with agreed punitive measures for repeat offences and non-compliance)<br>• Contractors adopting a policy to cooperate with law enforcement agencies in | Project Manager/Site Manager AMPYR/EPC Site Manager and HSSE personnel | • Physical inspection and grievance records | The proposed activities to be considered upon commencing any construction work | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Monthly Progress Report |

| S. No. | Project Activities | Impacts/ Issue | Mitigation Measures | Responsibility for ensuring implementation of the suggested mitigation | Means of Verification that mitigation has been met | Timelines / Frequency of Monitoring | Responsibility for implementation of monitoring | Reporting Requirements |
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| | | | investigating complaints about gender-based violence.<br>Further, complementary actions by AMPYR can include the following which are focused on public administration and law enforcement:<br>• Reinforcing local police in a remote setting, where services may not be sufficiently staffed or equipped to maintain public order after the influx,<br>• Ensuring that complaints about gender-based violence are taken seriously by local law enforcement, which may be supported by deploying female officers to the Project area, and participating in preventive training with workers to demonstrate the presence of government authority in the Project area<br>In addition, following measures need to also be undertaken<br>• Communication to local community, shops and vendors prior to the start of the construction;<br>• Local community to be made aware of the grievance mechanism and provide access to the local community and labourers to the grievance redress mechanism for the Project;<br>• Labour Camp is planned to be located away from nearby settlement, with entry control, if located near an existing settlement/residential area<br>• Restricted access of local persons in the labour camp<br>• Movement of migrant labourers with in the residential areas in the proximity of camps should be restricted. | | | | | |
| **Ecological Measures** | | | | | | | | |

| S. No. | Project Activities | Impacts/ Issue | Mitigation Measures | Responsibility for ensuring implementation of the suggested mitigation | Means of Verification that mitigation has been met | Timelines / Frequency of Monitoring | Responsibility for implementation of monitoring | Reporting Requirements |
|---|---|---|---|---|---|---|---|---|
| 16 | Design consideration for tower and conductors | Impact on Threatened (IUCN v2.2020) and Schedule I (WPA, 1972) Vulture specie, Birds of Prey and Migratory Birds, due to electrocution and collision. | • Line design modifications for mitigating bird casualties should include sufficient spacing between different conductors and between conductors and grounded wires or hardware. Spacing between conductors should be not less than 140 cm and 70cm between perching sites and live components. In areas where large birds are present like vultures (e.g., the wing span of White-rumped Vulture is 2.1 m) or large raptors, distances greater than 2.7m between power lines and more than 1.8m between perch and energised parts are recommended.<br>• Line markers like spheres, swinging plates, spiral vibration dampers, strips, swan flight diverters, bird flappers, aerial marker spheres, ribbons to be installed on conductors to increase visibility of the conductor, it is recommended to install barker balls on the topmost earth wire at an interval of 25m.<br>• Line markers should be as large as possible and increase the visible thickness of the line by at least 20 cm, for a length of at least 10-20 cm. Spacing of each device should not be more than 5-10 m apart. It is crucial that the line markers should incorporate as much contrast with relevant backgrounds as possible[2]. The technical specifications for bird flight diverter[3], in consultation with Central Electricity Authority, India should be followed.<br>• Where poles or pylons or substation hardware pose a risk of electrocution to birds | Project Manager/Site Manager AMPYR/EPC Site Manager and HSSE personnel | Visual Verification | Duration of the Activity | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Report from onsite HSSE officer to HSSE department |

[2] Prinsen, H.A.M., Smallie, J.J., Boere, G.C. & Píres, N. (Compilers), 2012. Guidelines on How to Avoid or Mitigate Impact of Electricity Power Grids on Migratory Birds in the African-Eurasian Region. AEWA Conservation Guidelines No. 14, CMS Technical Series No. 29, AEWA Technical Series No. 50, CMS Raptors MOU Technical Series No. 3, Bonn, Germany.

[3] Technical_Specifications_for_Bird_Flight_Diverter.pdf (cea.nic.in)

| S. No. | Project Activities | Impacts/ Issue | Mitigation Measures | Responsibility for ensuring implementation of the suggested mitigation | Means of Verification that mitigation has been met | Timelines / Frequency of Monitoring | Responsibility for implementation of monitoring | Reporting Requirements |
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| | | | by virtue of the insufficient clearances between critical hardware, it is possible to rectify the situation with add-on mitigation like using insulation.<br>• Perch management: Cross-arms, insulators and other parts of the power lines can be constructed so that there is no space for birds to perch where they can be close to energised wires. This is often done by using exclusion devices, or perch deterrents. | | | | | |
| 17 | Vegetation Clearance;<br>Excavation and construction activities;<br>Laying of approach roads; | Habitat (Terrestrial and Aquatic) Modification and Loss | • Vegetation disturbance and clearance to be restricted to the Project activity area only;<br>• Larger mature trees with significant height and girth to be avoided to the extent possible when constructing the solar compound. Larger trees within the solar compound site are to be avoided as part of the micro-siting of the solar modules. Mature trees with visible nest should be avoided for the current breeding season to the extent possible<br>• Unnecessary disturbance of neighbouring vegetation due to off-road vehicular movement, fuel wood procurement, needless expansion of labour camp and destruction of floral resources should be prohibited;<br>• Site levelling and clearing activity to not result in soil erosion that will affect the surrounding habitat. There are various soil erosion solutions that can be used as preventive measures like erosion control blankets, these blankets keep soil from shifting or moving during heavy rains and winds, reducing runoff and preventing soil erosion. To aid the recovery of undergrowth the company | Project Manager/Site Manager AMPYR/EPC Site Manager and HSSE personnel | Visual Verification | Duration of the Activity | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Report from onsite HSSE officer to HSSE department |

| S. No. | Project Activities | Impacts/ Issue | Mitigation Measures | Responsibility for ensuring implementation of the suggested mitigation | Means of Verification that mitigation has been met | Timelines / Frequency of Monitoring | Responsibility for implementation of monitoring | Reporting Requirements |
|---|---|---|---|---|---|---|---|---|
| | | | can hydroseed, applying a mixture of seeds, mulch, fertilizer and water to the land with a pressure hose.<br>• Project construction related facilities such as site office, store yard, camp, should be sited within the land parcel planned to be developed as the solar project site to reduce physical footprint of the project and avid additional loss/modification of terrestrial habitat<br>• In case of chance discovery of pre-existing nest and ground roosting site, that area to be temporarily avoided for construction activity.<br>• Labour Camp/ Mess Facility to be provided with cooking gas, to reduce additional modification of habitat from fuel weed collection.<br>• Camp and site office to be provided with Toiled and sewage generated onsite to be treated and disposed through septic tanks and soak pits as per specifications given in IS 2470: 1995 (Part I and II)<br>• Ensure proper cover and stacking of loose construction material at site to prevent surface runoff and contamination of receiving water body.<br>• Unloading and loading protocols to be prepared for diesel, oil and used oil respectively and workers trained to prevent/contain spills and leaks;<br>• Provision for impervious storage area, especially for fuel & lubricant, hazardous waste, etc. to be made onsite.<br>• Spill/ leakage clearance plan to be adopted for immediate cleaning of spills and leakages | | | | | |

| S. No. | Project Activities | Impacts/ Issue | Mitigation Measures | Responsibility for ensuring implementation of the suggested mitigation | Means of Verification that mitigation has been met | Timelines / Frequency of Monitoring | Responsibility for implementation of monitoring | Reporting Requirements |
|---|---|---|---|---|---|---|---|---|
| | | | • Vehicles and equipment to undergo regular maintenance to avoid any oil leakages.<br>• Broken or damaged solar panels are required to be immediately shifted to a designated area in scrap yard to avoid any type of land contamination;<br>• Noise control measures such as acoustic enclosures for DG sets, noise attenuation barriers in areas near sensitive habitat and proper maintenance of the vehicles used for the Project to be implemented to reduce the effect of construction noise on local ecology | | | | | |
| 18 | Construction activities | Human Wildlife Conflict | • Strict anti-poaching policies to be adopted by AMPYR, and the policy along with penalties associated with poaching must be communicated to all project personnel, subcontractors and labours.<br>• Adequate toilets, gas/firewood and space to be provided in any anticipated labour accommodation and the labourers to be informed not to enter or utilize any resources from surrounding forest land over the course of the construction period.<br>• Excavated areas to be adequately fenced and security to be deployed to prevent wildlife intrusion into these areas.<br>• Construction activities and transportation to be avoided during peak ecological activity i.e. dawn (5:30 am to 7:30 am) and dusk (5:00 pm to 7:00 pm). Night-time activities to be kept to a minimum.<br>• Areas with pre-existing nests, ground-roosting sites and burrows to be avoided for construction related work to reduce the impact on local fauna. | Project Manager/Site Manager AMPYR/EPC Site Manager and HSSE personnel | Visual Verification | Duration of the Activity | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Report from onsite HSSE officer to HSSE department |

| S. No. | Project Activities | Impacts/ Issue | Mitigation Measures | Responsibility for ensuring implementation of the suggested mitigation | Means of Verification that mitigation has been met | Timelines / Frequency of Monitoring | Responsibility for implementation of monitoring | Reporting Requirements |
|---|---|---|---|---|---|---|---|---|
| | | | • In case any camp is considered for the accommodation of labours and professionals associated with the project or in case of pantry or mess facility, all generated kitchen waste (uneaten food, discarded vegetable material) to be disposed off through authorised vendors. In case there any requirement of temporary storage (overnight) kitchen waste to be stored in closed containers or bean bags, to present release of smell. Considering remote location of the TL route, in case waste disposal through authorised vendor is not possible, kitchen waste to be disposed off in pits dug in ground. Pits to be covered by soil every night to prevent release of smell. As smell of cooked/ uncooked/ raw/ decomposing food material or kitchen waste can attract wildlife like scavengers. | | | | | |
| 19 | Planning and erection of transmission Line | Collision and Electrocution of Avian and Bats and Loss of Resources and Ecosystem Services | • Nesting trees to be avoided to the extent possible when it falls within the Solar Park site.<br>• Larger mature trees[4] with significant height and girth to be avoided to the extent possible when constructing the solar Project. Larger trees can be set aside within the Project site and avoided as part of the micro-siting of the solar modules.<br>• Seeding of native plant species outside of the Project site especially in areas where the soil layers have been impacted can offset the loss of floral resources and dependent ecosystem services. | Project Manager/Site Manager AMPYR/EPC Site Manager and HSSE personnel | Visual Verification | Duration of the Activity | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Report from onsite HSSE officer to HSSE department |

[4] Mature trees can provide several ecosystem services including firewood, non-timber forest produce, shelter, climate regulation, habitat provision and foraging resources.

## TABLE 1.3 ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN (OPERATION PHASE)

| S. No. | Project Activity(ies) | Impacts/ Issue | Mitigation Measures | Responsibility for ensuring implementation of the suggested mitigation | Means of Verification that mitigation has been met | Timelines / Frequency of Monitoring | Responsibility for implementation of monitoring | Reporting Requirements |
|---|---|---|---|---|---|---|---|---|
| **Impact on land and soil environment** | | | | | | | | |
| 1. | Improper Management of Solid Wastes | Soil Contamination | • Municipal domestic waste generated at site to be segregated onsite<br>• Daily collection and disposal of waste to be ensured<br>• The municipal waste to be routed through proper collection and handover to local municipal body for further disposal | O and M Site Manager/ O and M Contractor site Manager/ HSSE Personnel | Site Inspection | Monthly | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Quarterly Progress Reports |
| 2. | Improper management of hazardous waste | Soil Contamination | • Ensure oil/ lubricants are stored on impervious floor in the storage area having secondary containment<br>• Use of spill control kits to contain and clean small spills and leaks during O&M activities<br>• The guidelines and procedures to be prepared and followed for immediate clean-up actions following any spillages<br>• Ensure hazardous waste is properly labelled, stored onsite at a location provided with impervious surface, shed and secondary containment system as per in accordance to Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016<br>• Ensure proper documentation is maintained<br>• Disposal of hazardous wastes to be done strictly as per the conditions of authorisation granted by Maharashtra Pollution Control Board | O and M Site Manager/ O and M Contractor site Manager/ HSSE Personnel | Site Inspection, records and training records | Monthly | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Quarterly Progress Reports |
| 3. | Impacts due to leaks and spills | Soil Contamination | • Spill control kits to be used to contain and clean small spills and leaks<br>• The sewage generated onsite to be treated and disposed through septic tanks and soak pits as per specifications given in IS 2470: 1995 (Part I and II).<br>• Transport vehicles and equipment shall undergo regular maintenance to avoid any oil leakages<br>• Offloading and loading protocols to be prepared for oil, lubricants and used oil respectively and workers trained to prevent/contain spills and leaks. | O and M Site Manager/ O and M Contractor site Manager/ HSSE Personnel | Site Inspection | Monthly | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Quarterly Progress Reports |

| S. No. | Project Activity(ies) | Impacts/ Issue | Mitigation Measures | Responsibility for ensuring implementation of the suggested mitigation | Means of Verification that mitigation has been met | Timelines / Frequency of Monitoring | Responsibility for implementation of monitoring | Reporting Requirements |
|---|---|---|---|---|---|---|---|---|
| | | | • PV modules to be inspected periodically for defects that can appear in the form of burn marks, discoloration, delamination, or broken glass. An authorised person to walk the site to confirm that there are no broken modules (shattered glass) and broken modules to not be sprayed with water<br>• Broken or damaged solar panels are required to be immediately shifted to a designated area in scrap yard to avoid any type of land contamination<br>• Repair and maintenance of vehicles shall be conducted in a designated area on impervious floor. | | | | | |
| **Impact on water resources** | | | | | | | | |
| 4. | • Water requirement for cleaning of solar modules<br>• Domestic water for site staff | Stress on Water Availability | • Water tanker supply if required or proposed to be used by contractors, it is to be ensured that water tanker supply is procured from authorised vendors only;<br>• Adopt less water consuming module cleaning methods;<br>• As a good industry practise and in line with MNRE's advisory for effective usage of water in Solar Power Plants dated 3 June 2019, management to check feasibility of using dry cleaning of modules to the maximum extent possible;<br>• Provisions for rain water harvesting structures along with rooftop rainwater harvesting;<br>• Optimising water usage by application of water conservation measures such as sensor based taps, low flush urinals etc.<br>• Maintain logbook for water consumption<br>• Team to be sensitized about water conservation and encouraged for optimal use of water<br>• Regular inspections of pipelines and water storage infrastructure within the control monitoring office to be undertaken to ensure that there is no wastage of water resources<br>• Recycling/reusing to the extent possible | O and M Site Manager/ O and M Contractor site Manager/ HSSE Personnel | Site Inspection, records and training records | Monthly | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Quarterly Progress Reports |

| S. No. | Project Activity(ies) | Impacts/ Issue | Mitigation Measures | Responsibility for ensuring implementation of the suggested mitigation | Means of Verification that mitigation has been met | Timelines / Frequency of Monitoring | Responsibility for implementation of monitoring | Reporting Requirements |
|---|---|---|---|---|---|---|---|---|
| 5. | Storage of hazardous substances and waste onsite | Water Contamination | • The provisions of septic tank and soak pits to be provided (as per specifications given in IS 2470 1995 Part I and Part II) onsite for treatment and disposal of sewage, thereby minimizing the impacts of wastewater discharge<br>• Spill, leakage and clearance plan to be adopted for immediate cleaning of spills and leaks<br>• Planning of toilets, soak pits and septic tanks, waste collection areas to be away from natural drainage channels<br>• Provision for impervious storage area, especially for fuel & lubricant, hazardous waste, etc. will be made onsite<br>• Use of licensed contractors for management and disposal of waste and sludge | O and M Site Manager/ O and M Contractor site Manager/ HSSE Personnel | Site Inspection | Monthly | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Quarterly Progress Reports |
| **Impact on occupational health and safety** | | | | | | | | |
| 6. | O&M activities of solar plant, internal transmission line and working on live wires, etc. | Occupational Health and Safety Impacts | • All the maintenance activities to be carried out during day time hours and vigilance to be maintained for any potential accidents<br>• Personal Protective Equipment (PPEs) including safety shoes, helmets, goggles, ear muffs and face mask to be provided as necessary<br>• Electrical and maintenance work to not be carried out during poor weather and during lightning strikes<br>• All workers to be provided with training with Health & safety policies in place with appropriate refresher courses throughout the life cycle of the project<br>• SOPs to be prepared for O&M activities<br>• Work Permit system to be implemented<br>• Records of incident/ accidents to be maintained and route cause analysis of the accidents to be undertaken<br>• Safe drinking water to be provided for the workers<br>• Security to be deputed at potential accident sites to restrict entry and prevent near misses, injuries and fatalities<br>• First aid box to be provided at all the maintenance sites and | O and M Site Manager/ O and M Contractor site Manager/ HSSE Personnel | Site Inspection , Record Keeping and Training Records | Monthly | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Quarterly Progress Reports |

| S. No. | Project Activity(ies) | Impacts/ Issue | Mitigation Measures | Responsibility for ensuring implementation of the suggested mitigation | Means of Verification that mitigation has been met | Timelines / Frequency of Monitoring | Responsibility for implementation of monitoring | Reporting Requirements |
|---|---|---|---|---|---|---|---|---|
| | | | trained person to be appointed to manage it<br>• An emergency response plan to be in place to account for natural disasters, accidents and any emergency. The nearest hospital, ambulance, fire station to be identified in the emergency response plan. | | | | | |
| | | Extreme weather conditions and natural disaster | • The Project to include measures to be taken during a natural disaster (such as earthquake) and extreme weather conditions (such as high wind speed/cyclone, thunderstorms or heavy rainfall), such as halting of any activities being carried out, shutting down of plant machinery, seeking shelter under desk/tables or designated areas for emergencies, staying indoors, etc.<br>• The state specific disaster management plan to be referred to for measures to be taken during a disaster. | O and M Site Manager/ O and M Contractor site Manager/ HSSE Personnel | | | | |
| **Social Impacts** | | | | | | | | |
| **Local Employment** | | | | | | | | |
| 7 | Enhancement measures for the local community through economic opportunities | Economy and Employment – Positive Impact | It is understood that employment opportunities will be greater during the construction phase than the operations phase. The opportunities during the operations phase could be limited to housekeeping or security personnel. As the impacts of the Project on the local economy and employment is positive, the following measures have been recommended to further enhance the positive impact:<br>• Sourcing local labour wherever possible should be made obligatory for the sub-contractors and in all major procurement activities. AMPYR should establish a mechanism to audit subcontractors and suppliers with respect to compliance of utilizing local labour and resources;<br>• A preference will be given to young adults/ children of landowners from Mhasale.<br>• It should be clearly communicated to the workers during the construction period that the employment will be | O and M Site Manager/ O and M Contractor site Manager/ HSSE Personnel | Discussion with O&M In-charge, Visual inspection | Weekly monitoring | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Reports from different contractors to the HSSE In-charge |

| S. No. | Project Activity(ies) | Impacts/ Issue | Mitigation Measures | Responsibility for ensuring implementation of the suggested mitigation | Means of Verification that mitigation has been met | Timelines / Frequency of Monitoring | Responsibility for implementation of monitoring | Reporting Requirements |
|---|---|---|---|---|---|---|---|---|
| | | | short-term and the duration should be communicated upfront;<br>• Information on local employment should be communicated to the Gram Panchayats and information on availability of employment opportunities should be displayed at the Gram Panchayat office (in the local language) in consultation with the Sarpanch; and<br>• The Grievance Redressal Mechanism of the Project should be applicable to the contractual workforce engaged throughout the Project lifecycle. | | | | | |
| **Community Health and Safety** | | | | | | | | |
| 8 | Impact on community health and safety during operational phase | Threat to Health and Safety of the Community | • Where community residential clusters are close to the Project boundary, keep a safety setback (as relevant) to mitigate the heat island effect;<br>• Community sensitization sessions should be re-organised at the beginning of Operation phase, in order to mention about the new developments in the area and provided an understating of the precautions to be taken for safety;<br>• Project’s Grievance Redressal Mechanism for the community shall still be in implementation to deal with any concerns of community health and safety, being raised by the local community.<br>Mitigation Measures along Transmission Line during operational phase:<br>• At Substation, SOPs to be prepared for all O&M activities.<br>• The lock in-lock out system to be followed during maintenance/ repair activities at substation and transmission line;<br>• Records of incident/ accidents shall be maintained;<br>• Root cause analysis shall be carried out for any incident/ accident<br>• Provide the local community an understanding of the Project activities and the potential H&S risks and the grievance redressal mechanism as part of the | O and M Site Manager/ O and M Contractor site Manager/ HSSE Personnel | Discussion with O&M In-charge, Visual inspection | Weekly monitoring | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Reports from different contractors to the HSSE In-charge |

| S. No. | Project Activity(ies) | Impacts/ Issue | Mitigation Measures | Responsibility for ensuring implementation of the suggested mitigation | Means of Verification that mitigation has been met | Timelines / Frequency of Monitoring | Responsibility for implementation of monitoring | Reporting Requirements |
|---|---|---|---|---|---|---|---|---|
| | | | stakeholder engagement process; | | | | | |
| **Impact due to Labour Influx** | | | | | | | | |
| 9 | Influx of Labour | Limited opportunity for local workers | While the significance of the impact on economy and employment opportunities during the operations phase is understood to be positive, the following measures should be put in place to ensure that the local community receives maximum benefit from the presence of the Project:<br>• Preference should be provided to local labour or suppliers to pass on maximum economic benefit locally,<br>• Ensure that security guards are trained to maintain positive behaviour with the community representatives to avoid any conflict with them,<br>• The Project should provide the local community an understanding of the operational activities and the grievance redressal mechanism should be a part of the stakeholder engagement process. | O and M Site Manager/ O and M Contractor site Manager/ HSSE Personnel | • Health and Safety Audits of contractors<br>• Physical Inspection | Monthly | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Report from onsite HSSE officer |
| **Ecological Measures** | | | | | | | | |
| 10 | Operation of Solar Power Plant | Impact on nearby Terrestrial Habitat and Ecosystem Services | • Unloading and loading protocols to be prepared for diesel, oil and used oil respectively and workers trained to prevent/contain spills and leaks;<br>• Provision for an impervious storage area, especially for fuel & lubricant, hazardous waste, etc. to be made onsite.<br>• Spill/ leakage clearance plan to be adopted for immediate cleaning of spills and leakages<br>• Vehicles and equipment should undergo regular maintenance to avoid any oil leakages.<br>• Broken or damaged solar panels are required to be immediately shifted to a designated area in scrap yard to avoid any type of land contamination;<br>• The sewage generated onsite (from site office) to be treated and disposed through septic tanks and soak pits as per specifications given in IS 2470: 1995 (Part I and II) | O and M Site Manager/ O and M Contractor site Manager/ HSSE Personnel | Visual inspection and record keeping | Monthly | HSSE Manager | Reports from EPC to the HSSE In-charge |

| S. No. | Project Activity(ies) | Impacts/ Issue | Mitigation Measures | Responsibility for ensuring implementation of the suggested mitigation | Means of Verification that mitigation has been met | Timelines / Frequency of Monitoring | Responsibility for implementation of monitoring | Reporting Requirements |
|---|---|---|---|---|---|---|---|---|
| 11 | Power evacuation | Electrocution and collision with transmission line components | • Installed Bird diverters, if any, to be checked monthly for damage and repaired or replaced.<br>• If any section of transmission line is insulated then monthly insulating covers to be check for damage and if required replaced or repaired.<br>• Restrictions to be imposed so that dead carcasses are not disposed near the Project. The O&M team to be trained on removing any carcasses found around these Project components in a timely manner to ensure that no birds of prey are attracted to the Project site;<br>• The O&M team to be instructed to regularly inspect transmission towers as part of their periodic maintenance and rounds of the operational Project. The purpose is to identify any roosting or nesting of bird species; | O and M Site Manager/ O and M Contractor site Manager/ HSSE Personnel | Visual inspection and record keeping | Monthly | HSSE Manager | Reports from EPC to the HSSE In-charge |
| 12 | O&M work of TL | Impact on Threatened (IUCN v2.2020) and Schedule I (WPA, 1972) Birds of Prey and Migratory Birds, due to electrocution and collision. | • Prior to operation a detailed Collision Risk Modelling/Assessment is required to be done for each species based on their specific morphometrics, for the transmission line, complemented with bird flight movement data collected through "Vantage Point survey" spread across different seasons. This will estimate predicted annual mortality for each species and allow estimation of residual impacts.<br>• Post operation, AMPYR to regularly monitor the transmission line and the ground below the line for signs of bird hit and maintain a carcass register as part of the Operation and Maintenance (O&M) phase to record any bird carcasses or suspected bird carcasses. The register to include a date, type of specie (to the extent identifiable), geographic location and nearest transmission line infrastructure for each carcass entry. If possible, the register to be backed-up with photo-documentation of any identified carcasses or remains. If the number of carcasses are significant, then AMPYR to | O and M Site Manager/ O and M Contractor site Manager/ HSSE Personnel | Visual inspection and record keeping | Monthly | HSSE Manager | Reports from EPC to the HSSE In-charge |

| S. No. | Project Activity(ies) | Impacts/ Issue | Mitigation Measures | Responsibility for ensuring implementation of the suggested mitigation | Means of Verification that mitigation has been met | Timelines / Frequency of Monitoring | Responsibility for implementation of monitoring | Reporting Requirements |
|---|---|---|---|---|---|---|---|---|
| | | | commission an ecologist to suggest more stringent mitigation measures at the sensitive Project components. | | | | | |

## TABLE 1.4 ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN (DECOMMISSIONING PHASE)

| S. No. | Project Activity(ies) | Impacts/Issue | Mitigation Measures | Responsibility for ensuring implementation of the suggested mitigation | Means of Verification that mitigation has been met | Timelines / Frequency of Monitoring | Responsibility for implementation of monitoring | Reporting Requirements |
|---|---|---|---|---|---|---|---|---|
| **Impact on land and soil environment** | | | | | | | | |
| 1. | Removal of PV modules and other infrastructure | Soil Erosion | • Retained top soil, if any, to be relayed in the excavated and rehabilitated project areas<br>• Revegetation of the Project area with local fast growing vegetation<br>• Site should be restored to pre-project levels to the extent possible | Identified Decommissioning Team | Site Inspection | Weekly Monitoring | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Weekly Progress Reports |
| 2. | Improper management of solid wastes | Soil Contamination | • Demolition waste to be stored separately and be periodically collected by an authorized treatment and storage facility<br>• All waste to be stored in a shed that is protected from the elements (wind, rain, storms, etc.) and away from natural drainage channels<br>• Designated areas to be provided for Municipal Solid Waste (MSW) and daily collection and periodic disposal to be ensured | Identified Decommissioning Team | Site Inspection | Weekly Monitoring | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Weekly Progress Reports |
| 3. | Improper management of hazardous waste | Soil Contamination | • Ensure hazardous waste containers are properly labelled and stored onsite provided with impervious surface, shed and secondary containment system awaiting handling and disposal by an authorised vendor (authorised by the MPCB and as per the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, as amended.)<br>• Hazardous waste is not to be stored for more than 90 days<br>• No unauthorized dumping of used oil and other hazardous waste to be undertaken at the site<br>• In case of accidental/unintended spillage, the contaminated soil should be immediately collected and stored as hazardous waste<br>• A logbook to be maintained for quantity and type of hazardous waste generated | Identified Decommissioning Team | Site Inspection, Record Keeping and Training Records | Weekly Monitoring | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Weekly Progress Reports |

| S. No. | Project Activity(ies) | Impacts/Issue | Mitigation Measures | Responsibility for ensuring implementation of the suggested mitigation | Means of Verification that mitigation has been met | Timelines / Frequency of Monitoring | Responsibility for implementation of monitoring | Reporting Requirements |
|---|---|---|---|---|---|---|---|---|
| 4. | Impacts due to leaks and spills | Soil Contamination | • Spill control kits to be used to contain and clean small spills and leaks<br>• The sewage generated onsite should be treated and disposed through septic tanks and soak pits as per specifications given in IS 2470: 1995 (Part I and II).<br>• Transport vehicles and equipment to undergo regular maintenance to avoid any oil leakages<br>• The vehicular movement during decommissioning activities to be restricted to the designated route path<br>• The demolition/ dismantling waste to not be left over in whole project area and to be collected and stored at designated area only for further segregation and disposal<br>• Offloading and loading protocols to be prepared for diesel, oil and used oil respectively and workers trained to prevent/contain spills and leaks. | Identified Decommissioning Team | Site Inspection and Record Keeping | Weekly Monitoring | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Weekly Progress Reports |
| **Impact on water resources** | | | | | | | | |
| 5. | • Storage of hazardous substances and waste onsite; and<br>• Demolition activities that causes dust and erosion. | Water contamination | • The provisions of septic tank and soak pits to be provided (as per specifications given in IS 2470 1995 Part I and Part II) onsite for treatment and disposal of sewage, thereby minimizing the impacts of wastewater discharge<br>• Planning of toilets, soak pits and septic tanks, waste collection areas to be away from natural drainage channels<br>• Spill, leakage and clearance plan to be adopted for immediate cleaning of spills and leaks<br>• Ensure proper cover and stacking of loose construction material to prevent surface runoff and contamination of nearby water bodies<br>• Use of licensed contractors for management and disposal of waste and sludge | Identified Decommissioning Team | Site Inspection, Record Keeping and Training Records | Weekly Monitoring | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Weekly Progress Reports |

| S. No. | Project Activity(ies) | Impacts/Issue | Mitigation Measures | Responsibility for ensuring implementation of the suggested mitigation | Means of Verification that mitigation has been met | Timelines / Frequency of Monitoring | Responsibility for implementation of monitoring | Reporting Requirements |
|---|---|---|---|---|---|---|---|---|
| | | | • Labourers to be given training towards proactive use of designated areas/bins for waste disposal and encouraged for use of toilets. Open defecation and random disposal of sewage to be strictly restricted | | | | | |
| **Impact on air environment** | | | | | | | | |
| 6. | • Operation of D.G. sets;<br>• Vehicular movement; and<br>• Demolition Activities | Particulate, fugitive and vehicular emissions | • Preventive measures such as storage of loose fine particulate matter materials in sheds, covering of these materials during transportation to be undertaken, for reducing dust as part of the embedded controls<br>• Covering of trucks with tarpaulin sheets during transportation of demolition waste<br>• Emissions from the emergency DG set and other stationary machines to be controlled by ensuring that the engines are always properly tuned and maintained<br>• Speed of vehicles on site to be limited to 10-15 km/hr which will help in minimizing fugitive dust emissions due to vehicular movement;<br>• Cease or phase down work if excess fugitive dust is to be observed. Investigate the source of dust and ensure proper suppression measures before re-commencing work.<br>• Proper maintenance of engines and use of vehicles with Pollution Under Control (PUC) Certificate<br>• Idling of vehicles and equipment to be prevented as part of periodical monitoring and auditing program, seek and review data pertaining to accidents and incidents involving vehicle fleets of the project | Identified Decommissioning Team | Site Inspection and Record Keeping | Weekly Monitoring | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Weekly Progress Reports |
| **Impact on ambient noise Levels** | | | | | | | | |
| 7. | • Noise from demolition activities; | Increased noise levels | • Normal working hours of construction to be defined (preferable 8 am to 6pm). If work needs to be | Identified Decommissioning Team | Site Inspection | Weekly Monitoring | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Weekly Progress Reports |

| S. No. | Project Activity(ies) | Impacts/Issue | Mitigation Measures | Responsibility for ensuring implementation of the suggested mitigation | Means of Verification that mitigation has been met | Timelines / Frequency of Monitoring | Responsibility for implementation of monitoring | Reporting Requirements |
|---|---|---|---|---|---|---|---|---|
| | • Operation of D.G. sets; and<br>• Vehicular movement | | undertaken outside these hours, it should be limited to activities which do not generate noise<br>• Only well-maintained equipment to be operated on site.<br>• If it is noticed that any particular equipment is generating too much noise then lubricating moving parts, tightening loose parts and replacing worn out components should be carried out to bring down the noise and placing all the noise generating equipment such as DG sets away from village settlement as possible<br>• DG set with acoustic enclosures shall be used<br>• Machinery and demolition equipment that may be in intermittent use to be shut down or throttled down during non-working hours<br>• Minimal use of vehicle horns and heavy engine breaking in the area needs to be encouraged. | | | | | |
| **Impact on occupational health and safety** | | | | | | | | |
| 8. | • Demolition and dismantling activities;<br>• Removal of transmission line infrastructure;<br>• movement of vehicles for carrying waste and extra materials outside the solar plant | Threat to Health and Safety of the construction workers and site personnel | • All the decommissioning activities to be carried out during daytime hours and vigilance should be maintained for any potential accidents<br>• Personal Protective Equipment (PPEs) including safety shoes, helmets, goggles, earmuffs and face mask to be provided as necessary<br>• Structural integrity to be checked before undertaking any work<br>• Electrical and maintenance work to not be carried out during poor weather and during lightning strikes<br>• All workers to be provided with training with Health & safety policies in place with appropriate refresher courses throughout the life cycle of the project | Identified Decommissioning Team | Site Inspection | Weekly Monitoring | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Weekly Progress Reports |

| S. No. | Project Activity(ies) | Impacts/Issue | Mitigation Measures | Responsibility for ensuring implementation of the suggested mitigation | Means of Verification that mitigation has been met | Timelines / Frequency of Monitoring | Responsibility for implementation of monitoring | Reporting Requirements |
|---|---|---|---|---|---|---|---|---|
| | | | • Permitting to be implemented to ensure that all the lifting equipment is operated by trained and authorised person only<br>• Appropriate safety harness and lowering/raising tools to be provided for the workers<br>• Safe drinking water to be provided for the workers<br>• Excavated areas to be temporarily fenced to avoid access to outsiders and wildlife<br>• Security to be deputed at potential accident sites to restrict entry and prevent near misses, injuries and fatalities<br>• First aid box to be provided at all the construction sites and trained person to be appointed to manage it<br>• An emergency response plan to be in place to account for natural disasters, accidents and any emergency. The nearest hospital, ambulance, fire station should be identified in the emergency response plan. | | | | | |
| **Social Impacts** | | | | | | | | |
| **Local Employment** | | | | | | | | |
| 1 | Enhancement measures for the local community through economic opportunities | Economy and Employment – Positive Impact | The decommissioning phase will require removal of machinery, workers and other temporary structures. The mitigation measures for decommissioning shall include the following:<br>• The Client should ensure that retrenchment packages are provided for all staff who stand to lose their jobs when the plant is decommissioned.<br>• The contractor shall inform the workers and local community about the duration of work;<br>• Reduction of worker will be done phase wise and corresponding to completion of each activity; and<br>• All waste generated from demobilisation shall be collected and disposed of at | Identified Decommissioning Team | Discussion with O&M In-charge, Visual inspection | Weekly monitoring | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Reports from different contractors to the HSSE In-charge |

| S. No. | Project Activity(ies) | Impacts/Issue | Mitigation Measures | Responsibility for ensuring implementation of the suggested mitigation | Means of Verification that mitigation has been met | Timelines / Frequency of Monitoring | Responsibility for implementation of monitoring | Reporting Requirements |
|---|---|---|---|---|---|---|---|---|
| | | | the nearest municipal disposal site.<br>• The Grievance Redressal Mechanism of the Project should be applicable to the contractual workforce engaged throughout the Project lifecycle.<br>• The Project should provide the local community an understanding of the decommissioning activities and the potential H&S risks and the grievance redressal mechanism as part of the stakeholder engagement process. | | | | | |
| **Ecological Measures** | | | | | | | | |
| 1 | Anthropogenic movement | Habitat disturbance | • Vegetation disturbance to be restricted to the project area;<br>• Topsoil that is disturbed to be stored separately for restoration of the habitat;<br>• Unnecessary disturbance of neighbouring vegetation to be strictly prohibited;<br>• Local grass species to be seeded in disturbed areas;<br>• Labour movement to be restricted between labour camp and project site and to not be allowed to venture in natural areas where no activity is planned; | Identified Decommissioning Team | Discussion with O&M In-charge, Visual inspection | Weekly monitoring | AMPYR Renewable Energy Resources Twelve Pvt. Ltd | Reports from different contractors to the HSSE In-charge |

## 1.10 IMPACT ASSESSMENT SUMMARY

Following a scoping exercise, this ESIA was focused on interactions between the Project activities and various resources/receptors that could result in significant impacts. The table below presents the outcomes of the comprehensive assessment of identified impacts as a result of the various phases of the Project.

### TABLE 1.5 IMPACT ASSESSMENT SUMMARY

| Impact Description | Impact Nature | Significance of Impact | |
|---|---|---|---|
| | | Without Mitigation | With Mitigation |
| **Environmental Impacts** | | | |
| **Construction Phase** | | | |
| Change in land use | Negative | Moderate | Moderate |
| Change in topography and drainage | Negative | Minor | Negligible |
| Impact on land and soil environment | Negative | Minor | Negligible |
| Impact on land due to improper waste disposal | Negative | Moderate | Minor |
| Soil Contamination due to leak / spill | Negative | Minor | Negligible |
| Water Resource Availability | Negative | Minor | Minor |
| Water Quality | Negative | Minor | Negligible |
| Ambient Air Quality | Negative | Minor | Negligible |
| Impact as a result of generation of noise | Negative | Minor | Minor to Negligible |
| Occupational health and safety | Negative | Moderate | Minor |
| **Operation Phase** | | | |
| Impact on land due to improper waste disposal | Negative | Minor | Negligible |
| Soil Contamination due to leak / spill | Negative | Minor | Negligible |
| Water Resource Availability | Negative | Moderate | Negligible |
| Water Quality | Negative | Minor | Negligible |
| Occupational health and safety | Negative | Moderate | Minor |

| Impact Description | Impact Nature | Significance of Impact | |
|---|---|---|---|
| | | Without Mitigation | With Mitigation |
| **Decommissioning Phase** | | | |
| Impact on land and soil environment | Negative | Minor | Negligible |
| Impact on land due to improper waste disposal | Negative | Moderate | Minor |
| Ambient Air Quality | Negative | Minor | Negligible |
| Impact as a result of generation of noise | Negative | Minor | Minor to Negligible |
| Occupational health and safety | Negative | Moderate | Minor |
| **Social Impacts** | | | |
| **Planning Phase** | | | |
| Loss of land and livelihood from agriculture for title-holders – Land sellers and lessors | Negative | Minor to Moderate | Negligible |
| Loss of livelihood from agriculture for users (agricultural labourers and sharecroppers) of land that is sold by land-owners | Negative | Moderate | Negligible |
| Impact on Landowners under Transmission Line RoW and Tower Footprint | Negative | Moderate | Minor |
| Gender-differentiated Impacts | Negative | Major | Minor |
| Impact on Scheduled Tribes | Negative | Minor to Moderate | Negligible |
| **Construction Phase** | | | |
| Community Health and Safety impacts | Negative | Minor to Moderate | Minor |
| Influx of Labour | Negative | Moderate | Minor |
| Economy and Employment | Positive | | |
| Gender-differentiated Impacts | Negative | Moderate | Minor |

| Impact Description | Impact Nature | Significance of Impact | |
|---|---|---|---|
| | | Without Mitigation | With Mitigation |
| **Operational Phase** | | | |
| Community Health and Safety impacts | Negative | Minor | Negligible |
| Influx of Labour | Negative | Minor | Negligible |
| Economy and Employment | Positive | | |
| **Decommissioning Phase** | | | |
| Economy and Employment | Negative | Minor | Negligible |
| **Ecological Impacts** | | | |
| **Construction Phase** | | | |
| Habitat Modification | Negative | Minor | Negligible |
| Impacts due to Construction Activities | Negative | Minor | Negligible |
| **Operational Phase** | | | |
| Collision and Electrocution Risk | Negative | Minor | Negligible |

## 1.11 PROJECT CATEGORIZATION AND JUSTIFICATION

CFM's ESMS ratings, provided in the table below, have been considered for the Project.

### TABLE 1.6 CFM ESMS RATINGS

| Rating | Description |
|---|---|
| Category A (High Risk) | Business activities with potential significant adverse environmental or social risks and/or impacts that are diverse, irreversible, or unprecedented. This category includes Projects that (i) trigger one or more of IFC PS 5, 6, 7 or 8 or (ii) demonstrate a context of social/political conflict or severe security issues that pose a significant potential risk to the Project; or (iii) present potential significant adverse social or environmental impacts which are diverse, irreversible or unprecedented.<br><br>As a general principle, CIO/CFM will only consider investments that are rated as Category A if it can be proven - on the basis of thorough due diligence, and an ESIA and consultation (and, if applicable, consent) process that is fully in line with the IFC Performances Standards at the Development Fund stage - that: |

| Rating | Description |
|---|---|
| | • The positive impacts of the investment would outweigh the potential adverse impacts; and<br>• Expert capacity will be dedicated to the mitigation and management of such impacts throughout all phases of the investment lifecycle by both the Project Company and CIO.<br><br>Secondly, CIO/CFM will avoid any investment that is rated as High unless, in addition to the above:<br>• There is clear and convincing evidence that the Project will deliver a high development impact in the Project area of influence;<br>• The involvement of CIO has already started in the DF phase, ensuring adequate leverage during the early development phase; and<br>• All High EandS Risk Criteria can and- will be applied during due diligence, contracting and monitoring. |
| Category B+ (Medium High Risk) | Projects with potential adverse social or environmental impacts that are generally beyond the site boundaries, largely reversible and can be addressed through relevant mitigation measures. |
| Category B (Medium Low Risk) | Projects with potential limited adverse social or environmental impacts that are few in number, generally site-specific, largely reversible and readily addressed through mitigation measures. |
| Category C (Low Risk) | Projects with minimal or no adverse social or environmental impact. |

The Project has been categorized as **Category B** as defined in the CFM ESMS and IFC described above. The justification for **Category B** using the definition provided in the CFM ESMS and IFC categorization has been provided below:

- Environmental and social impacts of the Project are anticipated during the construction phase and will encompass changes in land-use, increased noise levels, changes in air quality, use and changes in water quality, impacts on terrestrial ecology, occupational health and safety, etc.
- Solar based energy development is a non-polluting source of energy and thus is not likely to lead to any adverse impacts on the baseline environment during the operation phase.
- The Project will not result in physical displacement and will not trigger PS 7. No common property resource or any land has been procured from the ST households.

## 1.12 CONCLUSION

The proposed Project is a green energy project to generate 200 $MW_{ac}$/260 $MW_{p}$ through solar energy.

The Project is assessed to have potentially limited adverse environmental, social and biodiversity impacts that are few, generally site-specific, largely reversible and readily addressed through mitigation measures. The mitigation measures are set out in this ESMP, which consolidates all the mitigation measures recommended as part of the ESIA.