

# Environmental Assessment and Review Framework

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Nepal: South Asia Subregional Economic  
Cooperation Power System Expansion Project  
(Additional Financing)



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## **CURRENCY EQUIVALENTS**

(as of 1 May 2016)

Currency unit	–	Nepalese rupee/s (NRs)
NRs1.00	=	\$0.0093
\$1.00	=	NRs107

## **Abbreviations and Units**

ADB	Asian Development Bank
COPB	Country Operation Business Plan
EA	Executing Agency
EARF	Environmental Assessment and Review Framework
EHS	Environmental, health and safety
EMP	Environmental Management Program
GoN	Government of Nepal
GRM	Grievance redress mechanism
GWh	Giga-watt hour
IEE	Initial Environmental Examination
IPP	Independent Power Producer
IUCN	International Union for Conservation of Nature
kW	Kilowatt
kWp	Kilowatt peak
MoE	Ministry of Energy
MoEnv	Ministry of Environment, Science and Technology
MoF	Ministry of Finance
MoWR	Ministry of Water Resources
MW	Megawatt
NGO	Non-government organization
PMU	Project Management Unit
REA	Rapid Environmental Assessment
RoW	Right-of-way
SCF	Strategic Climate Fund
SPS	Safeguard Policy Statement
tCO <sub>2</sub> e	tons carbon dioxide equivalent
UC	User Committee
UNFCCC	United Nations Framework Convention on Climate Change
VDC	Village Development Committee

## **NOTE**

In this report, "\$" refers to US dollars.

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## 1. INTRODUCTION

1. This document provides the Environmental Assessment and Review Framework (EARF) procedures to be followed for all proposed sub-projects of the proposed Utility Scale Solar PV Projects Development component (the Project) of the South Asia Subregional Economic Cooperation (SASEC) Power System Expansion Project.<sup>1</sup> The Project components include (i) grid-connected utility-scale solar PV system at multiple sites; and (ii) technical assistance for project implementation.

2. Grid connected solar power installations (sub-projects) will be identified, screened, categorized, and assessed during Project implementation with an environmental management plan prepared and implemented as appropriate. The EARF outlines the procedures that will be followed for environmental assessment and review of all proposed sub-projects in accordance with the Asian Development Bank (ADB) *Safeguard Policy Statement 2009* (SPS 2009), and Government of Nepal (GoN) regulatory requirements. The EARF is intended primarily for use and reference by: (i) the Nepal Electricity Authority (NEA) as the EA; (ii) independent power producers (IPPs) who construct, own, and operate solar power plants as IAs; and (iii) ADB. The EARF will be translated into Nepali and disseminated to concerned public/parties accordingly, with the English version posted on the ADB website.

## 2. PROJECT AND OUTPUT OVERVIEW

3. The Project will facilitate improved electricity service reliability and energy security through output-based aid for installation and operation of utility-scale solar PV system installations at multiple sites. The Project is needed to address chronic electricity and fuel shortages which have grown worse in Nepal.

4. Country diagnostic studies indicate that unequal access to infrastructure, including electricity, is one of the critical constraints to Nepal's inclusive growth<sup>2</sup>. The Project will (i) bring about transformational impacts through scaling up output from solar energy systems, and (ii) provide technical assistance to ensure efficient start-up and sustainable operations. The Project will facilitate productive end uses of energy for grid-connected consumers.

5. The focus of the Project is to catalyze private sector participation in utility-scale solar power development, which is critical to improving energy security and electricity service reliability. The Project outputs will be:

- (i) At least 25 MW of grid-connected utility scale solar PV capacity, distributed over various project sites, with planned capacity of at least 1 MW per site, and a total number of around 15 subprojects is expected to be developed; and
- (ii) Technical assistance for capacity development of NEA, IPPs, and other stakeholders for project implementation.

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<sup>1</sup> This component was originally identified as part of an energy sector program loan. Due to the ongoing electricity and fuel shortages in Nepal, ADB and the Government of Nepal agreed to combine the solar development component with the SASEC Power System Expansion Project. This EARF is applicable to the utility-scale solar installations (subprojects) developed under Additional Financing to the SASEC project.

<sup>2</sup> Asian Development Bank, United Kingdom Department for International Development, and International Labor Organization. 2009. *Country Diagnostic Studies – Highlights of Nepal: Critical Development Constraints*. Manila London, and Geneva.

6. NEA will be the Project's Executing Agency (EA). A project management unit (PMU) has been established at NEA's Project Management Directorate funded by the Project. PMU will have two safeguard specialists, one social safeguard specialist and one environmental safeguard specialist for the current SASEC Power System Expansion Project. The solar project will be included in their scope of work. The project will be executed over a period of approximately five years, concurrent with the SASEC project.

7. The Project will be funded by a \$20 million grant from the Strategic Climate Fund (SCF)<sup>3</sup>. The Government will pass on the ADB administered grants to NEA.

8. Solar power installations will be constructed, owned, and operated by IPPs. Candidate sites will be identified by NEA and IPPs in consultation with other government agencies and commercial and industrial enterprises. Feasibility assessments for selected sites, including environmental and social assessments, will be conducted by the IPPs. Safeguard implementation arrangements will be incorporated into the project administration manual.

9. Consultants (individuals or firms) will be recruited in accordance with ADB's Guidelines on the Use of Consultants (2010, as amended from time to time). All contracts awarded under ADB administered funds will include safeguard provisions referencing the EMP/IEE.

### **3. ASSESSMENT OF LEGAL FRAMEWORK AND INSTITUTIONAL CAPACITY**

#### **3.1 Legal Framework**

10. The Interim Constitution of Nepal 2007 defines the right to live in clean environment as one of the fundamental rights of its citizens (Article 16). It prescribes for the State to give priority to the protection of the environment and prevention of its further damage due to physical development activities (Clause 5 of Article 35). Proceeding from, and conformable to, the Constitution, the Government of Nepal has passed a series of environmental laws, policies and implementing regulations and standards. Among these, the basic legislation that provides the framework within which environmental assessment is carried out in Nepal are the:

- Environmental Protection Act (EPA), 1997, which requires a proponent to undertake IEE or environmental impact assessment (EIA) of the proposed project and have the IEE or EIA report approved by the concerned sector agency or Ministry of Science, Technology and Environment (MoSTE), respectively, prior to implementation. The EPA: (i) sets out the review and approval process of IEE and EIA reports, that involve informing and consulting stakeholders; (ii) stipulates that no one is to create pollution that would cause significant adverse impacts on the environment or harm to public life and health, or to generate pollution beyond the prescribed standards; (iii) specifies for the Ministry in charge of environment (currently the MoSTE) to conduct inspection of approved projects to ensure that pollution prevention, control or mitigation is carried out according to the approved IEE or EIA report; (iv) provides for the protection of objects and places of national heritage and places with rare plants, wildlife and biological diversity; and (v) states that any person/party affected by pollution or adverse environmental impact caused by anybody may apply to the prescribed authority for compensation to be recovered from the polluter/pollution generator.
- Environmental Protection Rules (EPR), 1997, and its amendments in 1999 and 2007, define the implementing rule and regulations of the IEE/EIA process,

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<sup>3</sup> The SCF and other grant co-financing will be administered by ADB.



elaborating the provisions in the EPA. The preparation, review and approval of IEE and EIA reports are dealt with in Rules 3 to 7 and 10 to 14. Schedules 1 and 2 list down the projects of activities that are required IEE and EIA, respectively, as amended in 2007.

11. Utility-scale power plants are required to conduct environmental assessment under GoN regulatory requirements, as set out in the *Environment Protection Act, 1997* and *Environment Protection Rules, 1997* and subsequent amendments. Other GoN laws, regulations, policies and guidelines, as summarized in Table 1, may be applicable to the Project based on the location, design, construction and operation of sub-projects which are mostly yet to be determined. IPPs will ensure that any necessary clearances and licenses are obtained in accordance with applicable regulations, and IEE needs to be completed by the time a contract is awarded.

12. The *Electricity Act, 1992* (Section 3) requires any person or corporate body who wants to conduct survey, generation, transmission or distribution of electricity over 1,000 kW (1 MW) to obtain a license under the Act. According to the Act, all the proposed subprojects will need a license. Under Section 3 of the *Electricity Regulation 1993* the following particulars must be provided by the project proponent: (i) detailed description of the project; (ii) map of the project (showing main structure/s); (iii) source of water and quantity of water to be utilized; (iv) area where electricity is to be distributed and estimated number of consumers to be benefited; (v) in the case of hydropower projects whether the water resource to be utilized has already been utilized by another or not, if so, particulars of the same; and (vi) other necessary particulars.

**Table 1: Environmental Regulatory Framework and Environmental Standards Relevant to the Project**

Acts, Regulations, Policies, Guidelines and Standards	Content
Electricity Act, 1992	<ul style="list-style-type: none"> <li>• Governs the use of water for hydropower production.</li> <li>• Establishes a system of licensing.</li> <li>• Sets out the powers, functions and duties of a license holder.</li> <li>• Provides certain financial incentives for license holders.</li> <li>• Sets out the powers of the government.<sup>1</sup></li> </ul>
Labor Act, 1992	Chapter 5 stipulates health and safety provisions at work places, keeping work premises clean and safe, e.g., (i) with provisions for solid waste, sewage and hazardous substance management; (ii) instituting measures to prevent dust, fumes and other impure materials that would adversely affect health; (iii) with supply of potable water and water for emergency situations; (iv) with arrangements for the use of protective devices and wears; (v) with fire safety arrangements; and (vi) measures for protection from hazardous machines/equipment and from physical injury or harm from lifting of heavy weights.
National Environmental Policy and Action Plan (NEPAP), 1993	Of its five objectives, most relevant to the Project are to: (i) mitigate adverse environmental impacts; and (ii) safeguard national & cultural heritage & preserve biodiversity, within & outside protected areas.
Electricity Regulation, 1993	<ul style="list-style-type: none"> <li>• Sets out the procedure for obtaining a license.</li> <li>• Deals with the acquisition of house and land and compensation.</li> <li>• Sets out the powers, functions and duties of licence holders.</li> </ul>
Forest Act, 1993	The Act prohibits the extraction of boulders, rocks, pebbles, sand or coil from national forests, defined as all forests, excluding private forests, whether marked or unmarked with forest boundary, to include waste or uncultivated lands, or unregistered lands surrounded by the forest or situated near adjacent forests as well as paths, streams rivers, lakes, riverine lands within the forest.
Water Resources Act, 1992	<ul style="list-style-type: none"> <li>• The umbrella Act governing water resource management.</li> <li>• Declares the order of priority of water use.</li> <li>• Vests ownership of water in the State.</li> </ul>

Acts, Regulations, Policies, Guidelines and Standards	Content
	<ul style="list-style-type: none"> <li>• Provides for the formation of water user associations and establishes a system of licensing.</li> <li>• Prohibits water pollution.<sup>1</sup></li> </ul>
Local Self Governance Regulation, 2000	<ul style="list-style-type: none"> <li>• Sets out the powers, functions and duties of VDC, Municipality and DDC in relation to water and sanitation.</li> <li>• Establishes the procedure for the formulation of water-related planning and project implementation.<sup>1</sup></li> </ul>
National Parks and Wildlife Conservation Act, 1973	Specifies limitations on activities in parks and conservation areas, including construction and clearing of vegetation.
Solid Waste Management Act, 2011	Article 4 provides that the management of hazardous, medical, chemical or industrial waste rests upon the generators of such wastes. Management should be as prescribed in the Act. Article 5 provides that individuals and entities have the duty to reduce the amount of solid waste generated while carrying out work or business.
National Ambient Air Quality Standards for Nepal, 2012*	Ambient air quality (Appendix D)
Sound Quality National Standard, 2012*	Noise (Appendix E)
National Drinking Water Quality Standards, 2006**	Drinking water quality (Appendix F)

1 – taken from WaterAid, 2005.

\* [http://moste.gov.np/legal\\_documents/Regulation#.V4iLg2fVxpN](http://moste.gov.np/legal_documents/Regulation#.V4iLg2fVxpN)

\*\* <http://www.wepa-db.net/policies/law/nepal/st01.htm>

13. The *National Parks and Wildlife Conservation Act, 1973* deals with the conservation and management of wildlife and habitat. The Act would apply to sub-projects proposed in national parks. The Act restricts entry into national parks without prior permission of the concerned authority. According to Article 5 of the Act, hunting of animals or birds, building or occupying houses, shelters or structures, occupying, clearing or planting or growing in any part, cutting, felling, removing or overshadowing any tree and removing any quarry or any other activities in national parks are banned. Under the *National Parks and Wildlife Conservation Regulation, 1974*, permission is required for entry into designated national parks. Section 22 of the Regulation deals with the permission required to prepare an inventory of plants and animals in national parks and wildlife conservation areas. Under Section 6 of the *Wildlife Reserve Regulation, 1977*, entry, construction of houses or sheds, clearance of forest and forest products, quarrying and overnight stay in a reserve area is prohibited unless authorized in writing by the relevant GoN authority. Section 11 of the Regulation restricts surveys and research works in these areas without prior written approval. All vehicles and persons passing through reserve areas are subject to security check. Under Article 7 of the *Buffer Zone Management Regulation, 1994*, clearance of forests and forest products, acquisition of land, use of quarry sites and hunting in buffer zones is restricted unless written approval of the relevant GoN authority is obtained.

### 3.2 International Environmental Agreements

14. Nepal is a party to the following international environmental conventions that may have some broad relevance to proposed Project activities:

- (i) United Nations Framework Convention on Climate Change (UNFCCC) – for parties to take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects. The related Kyoto Protocol includes the Clean Development Mechanism (CDM) which allows RE and other greenhouse gas reduction projects to earn and sell certified emission reduction (CER) credits.

Some sub-projects are expected to qualify for CDM registration, but CER revenue will not be mobilized as up-front cofinancing.

- (ii) Convention on Biodiversity - the objectives of the Convention are the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources. The Project has the potential to affect biodiversity by disrupting the movement of significant fish species or by the removal of unique habitat or flora species. Article 14 of the Biodiversity Convention states that adequate attention should be given to minimize and/or avoid adverse impacts on protected species if a project area is the core habitat of such species. The GoN has included 17 plant species and 39 animal species in its protected list. Appropriate mitigation measures to minimize or avoid impacts on protected species from sub-project construction and operation are required.
- (iii) Ramsar Convention on wetlands of international significance – Nepal has nine listed Ramsar sites that are all medium to large water bodies (each 90 ha or more in area). Inflows into these wetlands will not be affected by the solar power installations.
- (iv) Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal - the overarching objective of the Convention is to protect human health and the environment against the adverse effects of hazardous wastes, achieved through (i) a reduction of hazardous waste generation and promotion of environmentally sound management of hazardous wastes; (ii) restriction of transboundary movements of hazardous wastes; and (iii) a regulatory system applying to cases where transboundary movements are permissible. Nepal plans to install a battery management facility that will operate in accordance with the Convention's rules and guidelines. This plant will enable lead acid batteries, including any batteries used by the Project, to be recycled in Nepal rather than the current practice of recycling and/or disposal in India.

### 3.3 ADB Policy

15. SPS 2009 provides for the environmental requirements and review procedures of ADB and applies to all projects and grants they finance. SPS 2009 comprises three key safeguard areas: environment, involuntary resettlement, and indigenous peoples; and aims to avoid adverse project impacts to both the environment and the affected people; minimize, mitigate and/or compensate for adverse project impacts; and help Borrowers to strengthen their safeguard systems and to develop their capacity in managing the environmental and social risks.

16. SPS 2009 requirements include assessing impacts, planning and managing impact mitigations, preparing environmental assessment reports, disclosing information and undertaking consultation, establishing a grievance mechanism, and monitoring and reporting. SPS 2009 also includes particular environmental safeguard requirements pertaining to biodiversity conservation and sustainable management of natural resources, pollution prevention and abatement, occupational and community health and safety, and conservation of physical cultural resources. SPS 2009 requires incorporation of preventive and protective measures consistent with international good practice, as reflected in internationally recognized standards such as the World Bank Group's *Environment, Health and Safety Guidelines*.

17. The ADB policy principles for biodiversity conservation and physical cultural resources will be considered at the sub-project screening stage and for subsequent assessments.<sup>4</sup> Proposed sub-projects whose area of influence includes natural habitat, critical habitat, protected forest, buffer zone or legally protected area, nationally or internationally important physical cultural resources will be subject to prior review by ADB based on the REA checklist. Installations that could directly or indirectly impact on these environmentally sensitive features may trigger environment Category A. According to SPS 2009, a proposed project is classified as category A if it is likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. These impacts may affect an area larger than the sites or facilities subject to physical works. An environmental impact assessment is required. Environment category A sub-projects will not be eligible for financial support from the Project.

18. At the project identification phase, ADB uses a classification system to indicate the significance of potential environmental impacts and is determined by the category of its most environmentally-sensitive component, including direct, indirect, cumulative, and induced impacts within the project's area of influence. The project classification system is described in **Table 2.3**.

**Table 2 Environmental Classification According to SPS 2009**

Category	Definition	Assessment Requirement
A	Likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented, and may affect an area larger than the sites or facilities subject to physical works.	Environmental impact assessment (EIA)
B	Likely to have adverse environmental impacts that are less adverse than those of Category A. Impacts are site-specific, few if any of them irreversible, and in most cases mitigation measures can be designed more readily than Category A.	Initial Environmental Examination (IEE)
C	Likely to have minimal or no adverse environmental impacts.	No environmental assessment is required but the environmental implications of the project will be reviewed.
FI	Project involves investment of ADB funds to or through a financial intermediary (FI).	FIs will be required to establish an environmental and social management commensurate with the nature and risks of the FI's likely future portfolio to be maintained as part of the FI's overall management system.

Source: ADB. Safeguard Policy Statement 2009, p. 19. <http://www.adb.org/sites/default/files/institutional-document/32056/safeguard-policy-statement-june2009.pdf>.

### 3.4 Institutional Capacity

19. All sub-projects will be demand-driven, formally initiated by NEA and IPPs. IPPs are responsible for the design and environmental assessment of sub-projects, and monitoring implementation of environmental management during construction and operation. NEA staff

<sup>4</sup> Most of the candidate sites are in developed areas in close proximity to urban load centers, i.e., "brownfield" sites, including inside-the-fence and rooftop installations. Candidate "greenfield" sites may be available on undeveloped land which is not suitable for agriculture and which is not being used for other productive purposes.

expertise will be complemented by a network of qualified consultancies with environmental science degree and at least 5 years of environmental assessment of related projects that will be utilized to assist in identifying sub-projects as required, including preparing feasibility studies, safeguard assessments, environmental management plans (EMPs) and monitoring reports, and reviewing the capacity of IPPs to implement environmental safeguards.

20. Project-facilitated capacity development within NEA will focus on managing, implementing and promoting solar energy development by the private sector. As NEA is the EA for several ADB-funded projects, it is familiar with SPS 2009. Capacity development activities will be implemented through participation in relevant courses and seminars and through “learning-by-doing”, with technical backstopping by PMU. Capacity building activities on environmental safeguards will be conducted for IPPs so that they will get familiar with ADB safeguards requirements.

#### **4. ANTICIPATED ENVIRONMENTAL IMPACTS AND SUB-PROJECT ASSESSMENT**

21. All subprojects will be screened using the REA checklist and Solar Installations Environmental Assessment checklist in Appendix A and B as well as site visits to determine the environment category of each subproject. Environment category A sub-projects will not be eligible for financial support from the Project. The following criteria shall be applied for selection of subprojects:

- (i) no subprojects within or impacting critical habitat areas (according to the ADB SPS) such as designated wild-life sanctuaries, national parks or area of internationally significance (e.g., protected wetland designated by the Wetland Convention) will be included.
- (ii) no subprojects impacting Physical Cultural Resources or within or near cultural heritage designated by UNESCO or declared as archeologically protected by GON will be included.
- (iii) no subprojects that trigger ADB environment category A will be included.

22. Projects that involve activities on the prohibited investment activities list (Appendix C), and projects that do not comply with applicable national environment, health and safety laws and regulations will not be excluded from the ADB financing. The adverse environmental impacts of solar installations are expected to be minor as the candidate sites will be on (i) relatively flat land which is not being used for other productive purposes and minimal disturbance will be required for construction and operation, and (ii) other sites which host commercial and industrial enterprises. About 2.5 hectares of land will be required for each 1 MW of solar capacity.

23. Potential adverse impacts will be limited to minor disturbance, including increases in dust and noise levels due to ground work and installation machinery, potential occupational and community H&S risks, change of land use, contamination of soils or water from spills of fuel, oil and chemicals if any, some land disturbance for greenfield sites, disposal of foul sewage and solid waste from sanitation facilities of staff for construction and operation, and minor quantities of domestic wastewater from cleaning solar panels during the operational period.<sup>5</sup> Potential direct, indirect, induced or cumulative impacts should also be considered including the impacts of any associated distribution lines.

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<sup>5</sup> The potential negative impacts due to these activities are almost impossible to quantify.

24. The construction period of individual solar installations is expected to be 12 months or less. Construction camps will not be required due to the scale of installations, short time frame for construction, and hiring of local labor. The General EHS Guidelines will be followed for construction work.

25. Each solar installation will deliver net benefits in the form of expanded access to energy and productive end uses of energy that will far outweigh any potential adverse impacts. The main benefits accrue from avoided use of backup generator sets running on diesel or petrol, and improved quality of life associated with access to more reliable electricity services. The proposed solar plants will be connected to the existing grid substations. The General EHS Guidelines on Transmission Line will be followed for any grid connection work.

#### **4.1 Environmental Assessment of Sub-Projects**

26. The environmental assessment of individual sub-projects will be undertaken in accordance with ABD SPS requirements and GoN regulatory requirements including the *Environment Protection Act, 1997* and *Environment Protection Rules, 1997*. Assessment will involve (i) screening potential sub-projects using ADB's REA checklists (see Appendices A and B), and (ii) preparing an environmental assessment for individual sub-projects. All sub-projects will be either environment category B or C as environment category A is ineligible for financing. For category B sub-projects, an IEE including EMP will be prepared for each sub-project consistent with ADB and GoN requirements by the IPPs. The main objectives of the IEE of each subproject are to:

- (i) Provide an environmental baseline description of the Project area of influence;
- (ii) Identify and describe the Project's potential environmental impacts;
- (iii) Design mitigation measures to avoid or minimize adverse impacts;
- (iv) Describe the Project's public consultation process and Grievance Redress Mechanism (GRM); and
- (v) Provide Environmental Management and Monitoring Plans for the overall Project (including defining institutional responsibilities, capacity building and training plans, and budgeting).

27. Issues that should be addressed in the IEEs include, but not limited to, noise, dust, occupational H&S, community H&S, biodiversity, cultural heritage, management of electrical and other solid waste, welfare and sanitation facilities including disposal wastewater storage of fuel, oil and chemicals, slope stability (unless flat ground), protection of waterbodies and groundwater source (set back by at least 100m), cumulative and induced impacts etc.

28. For cat C subprojects, a generic EMP or code of practice should be prepared. EMP should cover occupational H&S due to work with electricity and at height if on rooftops, disposal of electrical type waste, and welfare facilities for construction and operational staff following national laws and regulations.

29. IPPs will prepare an IEE for each category B sub-project in consultation with stakeholders following existing GoN procedures. The IEE will be consistent with the outline and content contained in ADB SPS 2009. The level of detail and comprehensiveness of each IEE

and EMP will be commensurate with the significance of the potential impacts and risks (in accordance with the ADB SPS, 2009).<sup>6</sup>

## **5. CONSULTATION, INFORMATION DISCLOSURE, AND GRIEVANCE REDRESS MECHANISM**

### **5.1 Consultation and Information Disclosure**

30. ADB SPS 2009 requires projects to carry out meaningful public consultation on an ongoing basis. All sub-projects will be community-based, and as such consultation is built into and central to the sub-project design process from initiation onwards. Consultation must be specific to the environmental impacts of the subprojects. Public consultation will: (i) begin early and carry on throughout the project cycle; (ii) provide timely disclosure of relevant information, understandable and accessible to people; (iii) ensure a free and un-intimidated atmosphere without coercion; (iv) ensure gender inclusiveness tailored to the needs of disadvantaged and vulnerable groups; and (v) enable the incorporation of all relevant views of affected people, and stakeholders into project decision making, mitigation measures, the sharing of development benefits and opportunities and implementation issues. The PMU will follow ADB SPS 2009 requirements to carry out public consultations for both Category B and Category C sub-projects. The PMU and any appointed environmental assessment consultants will be open to contact/consultation by the public on environmental assessment matters during sub-project IEE and desktop environmental assessment preparation and design investigations.

31. All communication handouts shall be written in Nepali and all consultations will be documented. All relevant views raised during consultation shall be reported in the environmental assessment report, and considered in sub-project design and reflected in the environmental management plan as appropriate. Attendance sheets and notes of consultations shall be included in the environmental assessment report to document the consultation activities. Consultations must include vulnerable groups such as women, elderly and IP groups, if any.

32. Information disclosure will follow the procedure for ADB environment category B projects, and NEA equivalent procedures. For category C projects, information will be made available upon request. It is the policy of the ADB to have environmental assessment reports made available/accessible to the general public. The following EA-related documents will be posted on the ADB website: (i) draft EARF, before Project appraisal; (ii) Final or updated EARF, upon receipt; and (iii) IEE and EMP for individual sub-projects and environmental monitoring reports. NEA will submit IEEs including EMP and environmental monitoring reports to ADB and ADB will upload these reports on its website after review. Hard copies of the EARF and IEE reports (in English and Nepali) will be made available for perusal at the ADB Office in Nepal, at NEA head office, and at other locations accessible to stakeholders (to be determined by the NEA). Information will also be made available to residents adjacent to solar plants before the subproject approval. For those who cannot read, presentations will be made to ensure that subproject information is disseminated to all those who are interested in the project.

### **5.2 Grievance Redress Mechanism**

33. NEA has an existing procedure to receive inquiries and complaints about project-related activities (developed for other donor-funded projects), and to respond to such inquiries and

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<sup>6</sup> ADB SPS (2009); OM Section F1/OP, paragraph 7, page 2, 10 October 2013; and SPS 2009, Appendix 1, paragraph 12.

complaints. As the sub-projects are community-originated and community-based, consultation is built into and central to the sub-project development process.

34. A grievance redress mechanism (GRM) will be established to receive and facilitate the resolution of affected persons (AP) concerns, complaints, and grievances on project implementation and operational issues, including negotiated/voluntary land donation, relocation, income restoration, environmental management and other construction and operation related issues. The GRM will be proactive and accessible to all APs to address their concerns, grievances, and issues effectively and swiftly, in accordance with ADB SPS 2009. The proposed GRM for the solar project will follow that for the SASEC project as outlined below.

#### **5.2.1. First Level of GRM**

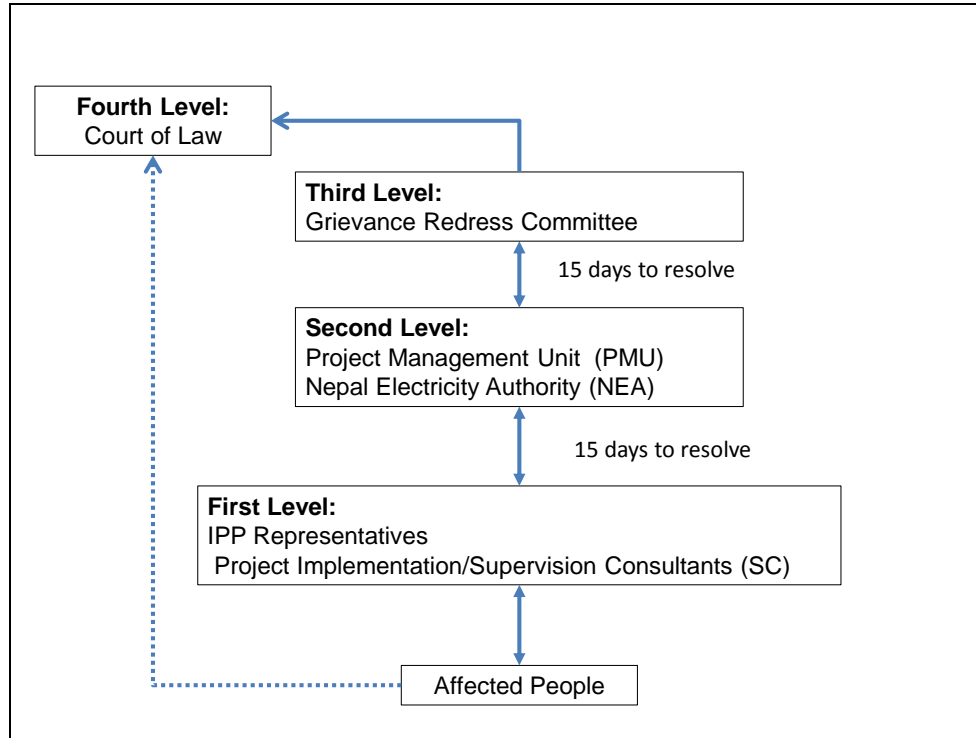
35. The first level and most accessible and immediate venue for the fastest resolve of grievances will be the on-site representative of the IPP which is developing the solar sub-project. If any complaints arise, the developer's representative, the construction contractors and project supervision consultant (SC) appointed by the developer with the assistance of Village Development Committee (VDC) representatives will immediately resolve the complaint on site. Any person with a grievance related to the project works can contact the SC to file a complaint, both verbal and written complaints will be accepted. The SC will document the complaint, and immediately address and resolve the issue at field-level with the developer, the construction contractor, representatives of the respected VDC and the affected persons within 15 days of receipt of a complain/grievances. The SC will fully document the following information: (i) name of the person, (ii) date of complaint received, (iii) nature of complaint, (iv) location of complaint, and (v) how the complaint was resolved. If the complaint remains unresolved within 10 days at the field level, the SC will forward the complaint to NEA's Project Management Unit (PMU).

#### **5.2.2. Second Level of GRM**

36. If the grievance remained unresolved, the person filing the grievance will be notified by the SC that the grievance was forwarded to the PMU. PMU with the support of SC and developer's representative will try to resolve the grievances through continuous interactions with the affected persons within 15 days of complaints forwarded by SC.



**Figure 1: Grievance Redress Mechanism**



### **5.2.3. Third Level of GRM**

37. If the grievance remains unresolved after referral to the PMU, the Chief District Officer (CDO) of the district will activate the third level of the GRM by referring the issue (with written documentation). A Grievance Redress Committee (GRC) will be formed, consisting of members of the PMU, affected persons, VDC, SC Environment Expert and a third party Non-Government Organization (NGO). A hearing will be called with the GRC, if necessary, where the affected person can present his/her concern/issues. The GRC will suggest corrective measures at the field level and assign clear responsibilities for implementing its decision within 15 days. The functions of the local GRC are as follows: (i) provide support to affected persons on problems arising from environmental or social disruption; asset acquisition (if necessary); and eligibility for entitlements, compensation and assistance; (ii) record grievances of affected persons, categorize and prioritize them and provide solutions within 10 days; and (iii) report to the aggrieved parties about developments regarding their grievances and decisions of the GRC. The consultant environment expert will be responsible for processing and placing all papers before the GRC, recording decisions, issuing minutes of the meetings and taking follow up action to see that formal orders are issued and the decisions carried out.

### **5.2.4. Court of Law/ Country's Legal System**

38. The proposed mechanism does not impede access to the country's judicial or administrative remedies. The AP has the right to refer the grievances to appropriate courts of

law if not satisfied with the redress at any stage of the process or the APs will have the choice to approach country's judicial system. The PIU will keep records of all grievances received including: contact details of complainant, date that the complaint was received, nature of grievance, agreed corrective actions and the date these were effected, and final outcome.

## **6. INSTITUTIONAL ARRANGEMENTS AND RESPONSIBILITIES**

39. The key institutions involved in Project management and implementation, including the environmental assessment and review process, are NEA, IPPs, construction contractors, and equipment and service providers, as described below.

### ***NEA/PMU***

40. NEA has established a Project Management Unit (PMU) within its Project Management Directorate (PMD). The PMU includes two safeguard specialists, one social and one environmental responsible for environmental and social safeguards implementation. The PMU is responsible for the ongoing ADB-funded projects covering transmission system expansion and upgrade, and energy efficiency and renewable energy development. The PMU will ensure that IPPs prepare environmental assessments as required by ADB SPS 2009 and relevant GoN regulatory requirements. The PMU will prepare monitoring reports twice a year and submit these reports to ADB. ADB will conduct site visits to confirm implementation is being done adequately.

### ***IPPs***

41. IPPs have primary responsibility for preparing environmental assessments as required by ADB SPS 2009 and relevant GoN regulatory requirements, and implementing EMPs as necessary. IPPs must ensure all the contracts include the EMP before the contract is bid and awarded and they must visit the site at least once per month to check on implementation of the EMP. If any unanticipated impacts occur, IPPs should take corrective actions.

### ***Consultants, Construction Contractors, Equipment Suppliers, and Other Service Providers***

42. Consultants will be contracted by NEA as required to assist in the preparation of the pipeline of sub-projects. This will include consulting services to complete IEEs and desktop environmental assessments for individual sub-projects.

43. Construction contractors, equipment suppliers, and other service providers will be engaged to install sub-projects. Construction contractors will have primary responsibility for environmental and social management and worker health and safety at sub-project construction sites under their control. They will be required to adhere to the World Bank Group's Environmental, Health and Safety (EHS) Guidelines and implement relevant sub-project environmental and social management measures prior to and during construction. They will also undertake day to day supervision and monitoring of implementation. This will include implementing controls such as spoil disposal, reconnection of cut services, and revegetation to stabilize sites. They will also be responsible for the provision of appropriate personal protective equipment (e.g., hard hats, safety boots, and hearing protection) to their workers. Equipment suppliers and other service providers are expected to adhere to best EHS management practices consistent with the scope of their activities.

### ***Asian Development Bank***

44. ADB will (i) review the draft EARF and its subsequent update as necessary before approval; (ii) review the IEEs for individual solar installations prior to NEA's signing of PPAs to

ensure that the IEEs meet the requirements of SPS 2009; (iii) review Project monitoring reports; and (iv) officially disclose environmental safeguards documents on its web site in accordance with the ADB *Public Communications Policy* (2011).

## **7. MONITORING AND REPORTING**

45. Every IPP with subproject in construction will request its contractor to submit a report on compliance with EMP to it twice a year. IPP with subproject in operation need only submit the report once a year unless otherwise requested. The IPP will submit these reports to PMU. PMU can then collate these reports together with findings of their site visit observations into the monitoring report which will be submitted to ADB.

46. Corrective actions will be taken for any unanticipated impacts and inadequate safeguards implementation. ADB will conduct periodic review missions which will include a review of safeguard implementation issues.

## Appendix A: Rapid Environmental Assessment (REA) Checklist for Solar Energy

### Instructions:

- (i) The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to the Environment and Safeguards Division (RSES), for endorsement by Director, RSES and for approval by the Chief Compliance Officer.
- (ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.
- (iii) Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title:

Sector Division:

Screening Questions	Yes	No	Remarks
<b>A. PROJECT SITING</b> IS THE PROJECT AREA ADJACENT TO OR WITHIN ANY OF THE FOLLOWING ENVIRONMENTALLY SENSITIVE AREAS?			
▪ PHYSICAL CULTURAL HERITAGE SITE			
▪ LOCATED IN OR NEAR TO LEGALLY PROTECTED AREA			
▪ LOCATED IN OR NEAR TO SEPCIAL HABITATS FOR BIODIVERSITY (MODIFIED OR NATURAL HABITATS)			
▪ WETLAND			
▪ MANGROVE			
▪ ESTUARINE			
▪ OFFSHORE (MARINE)			
<b>B. POTENTIAL ENVIRONMENTAL IMPACTS</b> WILL THE PROJECT CAUSE...			
▪ large scale land disturbance and land use impacts specially due to diversion of productive lands?			
▪ involuntary resettlement of people? (physical displacement and/or economic displacement)			
▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?			

Screening Questions	Yes	No	Remarks
▪ noise, vibration and dust from construction activities?			
▪ an increase in local traffic during construction?			
▪ environmental disturbances such as soil erosion, land contamination, water quality deterioration, air pollution, noise and vibrations during construction phase?			
• aesthetic degradation and property value loss due to establishment of plant and ancillary facilities?			
▪ changes in flow regimes of the water intake from surface water or underground wells due to abstraction for cooling purposes?			
▪ pollution of water bodies and aquatic ecosystem from wastewater treatment plant, from cooling towers, and wash-water during operation?			
▪ a threat to bird or bat life from colliding with the project facilities and/or being burned by concentrated solar rays?			
▪ industrial liquid (dielectric fluids, cleaning agents, and solvents) and solid wastes (lubricating oils, compressor oils, and hydraulic fluids) generated during construction and operations likely to pollute land and water resources?			
▪ Soil/water contamination due to use of hazardous materials or disposal of broken or damaged solar cells (photovoltaic technologies contain small amounts of cadmium, selenium and arsenic ) during installation, operation and decommissioning?			
▪ noise disturbance during operation due to the proximity of settlements or other features?			
▪ visual impacts due to reflection from solar collector arrays resulting in glint or glare?			
▪ large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?			
▪ social conflicts between local laborers and those from outside the area?			
▪ risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during construction, installation, operation, and decommissioning?			
▪ risks to community health and safety due to the transport, storage, and use and/or disposal of materials and wastes such as explosives, fuel and other chemicals during construction, and operation?			

Screening Questions	Yes	No	Remarks
<ul style="list-style-type: none"> <li>▪ community safety risks due to both accidental and natural causes, especially where the structural elements or components of the project are accessible to members of the affected community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?</li> </ul>			

## A Checklist for Preliminary Climate Risk Screening

**Country/Project Title:**

**Sector:**

**Subsector:**

**Division/Department:**

Screening Questions		Score	Remarks <sup>7</sup>
<b>Location and Design of project</b>	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather related events such as floods, droughts, storms, landslides?		
	Would the project design (e.g. the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc.)?		
<b>Materials and Maintenance</b>	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?		
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s)?		
<b>Performance of project outputs</b>	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?		

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response, will be categorized as high risk project.

**Result of Initial Screening (Low, Medium, High):** \_\_\_\_\_

**Other Comments:** \_\_\_\_\_  
 \_\_\_\_\_

**Prepared by:** \_\_\_\_\_

<sup>7</sup> If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

## APPENDIX B: SOLAR INSTALLATIONS ENVIRONMENTAL ASSESSMENT CHECKLIST

**Sub-Project Name:** .....

**Location:** ..... village

Ward No. ...., ..... VDC, ..... District

### Photos of the Sub-project Site:

#### 1. Project Description

Total capacity: ..... MW

Solar panels:

- number .....

- capacity/panel ..... Wp

Transmission line length: ..... km

#### 2. Project Site

Total structure footprint: ..... m<sup>2</sup>

Transmission line RoW area: ..... m length x 15 m wide RoW = ..... m<sup>2</sup>

Land type: cultivation forest shrubland

grassland yard degraded land

Ownership: private government community

Protected Area (PA)

or PA buffer zone within 2km of project site: yes no

National or international cultural heritage site within 2km of project site: yes no

If yes, name & describe  
(distance & location  
relative to site, etc.):

.....  
.....  
.....

Other unique values on  
site or nearby within 2km:

primary forest unique / aesthetically valuable landform

river wetland

local cultural heritage site other



If yes, name & describe  
(value, distance & location  
relative to site, etc.):

-----  
-----  
-----

### 3. Benefits

#### Power supply:

- households -----
  
- institutions      School/s      -----  
-----
  
- Health post/s      -----  
-----
  
- businesses      -----  
-----
  
- community facilities      -----  
    (e.g. street lights)      -----  
-----

### 4. Adverse Impacts

**Forest clearance:**      ----- m<sup>2</sup> for main structures

----- m<sup>2</sup> for distribution line RoW

**Distribution Line:**      ----- River crossings      yes      no

----- Distance between properties and distribution line      ----- m

Any species with high conservation significance to be cleared:      yes      no

If yes, name species &  
describe significance:

-----  
-----

#### Noise:

- sound pressure level      ----- dB(A)  
    (background)

- closest residence      ----- m

- residence down wind  
    for part of year      yes      no

- estimated max. noise  
    at residence      ----- dB(A)

**5. Consultation**

**Issues raised:**

-----  
-----  
-----  
-----

**How these issues were addressed:**

-----  
-----  
-----  
-----

## Appendix C<sup>8</sup>

### Prohibited Investment Activities List

The following do not qualify for Asian Development Bank financing:

- (i) production or activities involving harmful or exploitative forms of forced labor<sup>9</sup> or child labor;<sup>10</sup>
- (ii) production of or trade in any product or activity deemed illegal under host country laws or regulations or international conventions and agreements or subject to international phase-out or bans, such as (a) pharmaceuticals,<sup>11</sup> pesticides, and herbicides,<sup>12</sup> (b) ozone-depleting substances,<sup>13</sup> (c) polychlorinated biphenyls<sup>14</sup> and other hazardous chemicals,<sup>15</sup> (d) wildlife or wildlife products regulated under the Convention on International Trade in Endangered Species of Wild Fauna and Flora,<sup>16</sup> and (e) transboundary trade in waste or waste products;<sup>17</sup>
- (iii) production of or trade in weapons and munitions, including paramilitary materials;
- (iv) production of or trade in alcoholic beverages, excluding beer and wine;<sup>18</sup>
- (v) production of or trade in tobacco;<sup>10</sup>
- (vi) gambling, casinos, and equivalent enterprises;<sup>10</sup>
- (vii) production of or trade in radioactive materials,<sup>19</sup> including nuclear reactors and components thereof;
- (viii) production of, trade in, or use of unbounded asbestos fibers;<sup>20</sup>
- (ix) commercial logging operations or the purchase of logging equipment for use in primary tropical moist forests or old-growth forests; and

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<sup>8</sup> ADB SPS 2009, Appendix 5, p76.

<sup>9</sup> Forced labor means all work or services not voluntarily performed, that is, extracted from individuals under threat of force or penalty.

<sup>10</sup> Child labor means the employment of children whose age is below the host country's statutory minimum age of employment or employment of children in contravention of International Labor Organization Convention No. 138 "Minimum Age Convention" ([www.ilo.org](http://www.ilo.org)).

<sup>11</sup> A list of pharmaceutical products subject to phaseouts or bans is available at <http://www.who.int>.

<sup>12</sup> A list of pesticides and herbicides subject to phase-out or bans is available at <http://www.pic.int>.

<sup>13</sup> A list of the chemical compounds that react with and deplete stratospheric ozone resulting in the widely publicized ozone holes is listed in the Montreal Protocol, together with target reduction and phase-out dates. Information is available at <http://www.unep.org/ozone/montreal.shtml>.

<sup>14</sup> A group of highly toxic chemicals, polychlorinated biphenyls are likely to be found in oil-filled electrical transformers, capacitors, and switchgear dating from 1950 to 1985.

<sup>15</sup> A list of hazardous chemicals is available at <http://www.pic.int>.

<sup>16</sup> A list is available at <http://www.cites.org>.

<sup>17</sup> As defined by the Basel Convention; see <http://www.basel.int>.

<sup>18</sup> This does not apply to project sponsors who are not substantially involved in these activities. Not substantially involved means that the activity concerned is ancillary to a project sponsor's primary operations.

<sup>19</sup> This does not apply to the purchase of medical equipment, quality control (measurement) equipment, and any equipment for which ADB considers the radioactive source to be trivial and adequately shielded.

<sup>20</sup> This does not apply to the purchase and use of bonded asbestos cement sheeting where the asbestos content is less than 20%.

- (x) marine and coastal fishing practices, such as large-scale pelagic drift net fishing and fine mesh net fishing, harmful to vulnerable and protected species in large numbers and damaging to marine biodiversity and habitats.

### Appendix D National Ambient Air Quality Standard, 2012

Parameters	Units	Averaging time	Concentration max
TSP	$\mu\text{g}/\text{m}^3$	Annual	-
		24-hours	230
PM <sub>10</sub>	$\mu\text{g}/\text{m}^3$	Annual	-
		24-hours	120
Sulfur Dioxide	$\mu\text{g}/\text{m}^3$	Annual	50
		24-hours	70
Nitrogen Dioxide	$\mu\text{g}/\text{m}^3$	Annual	40
		24-hours	80
Carbon Monoxide	$\mu\text{g}/\text{m}^3$	8 hours	10,000
Lead	$\mu\text{g}/\text{m}^3$	Annual	0.5
Benzene	$\mu\text{g}/\text{m}^3$	Annual	5
PM <sub>2.5</sub>	$\mu\text{g}/\text{m}^3$	24-hours	40
Ozone	$\mu\text{g}/\text{m}^3$	8-hours	157

## Appendix E Sound Quality National Standard, 2012

Section 62 No 30 Nepal Rajpatra Part 5 Date: 2069/7/13 (2012 Oct 29)

Government Of Nepal

Ministry of Environment Science and Technology (Now Changed to Ministry of Population and Environment)

Notice 1

GoN in accordance to authority provided by Environmental Protection Regulation 2054 (1997) rule 15 following Noise Standard related National Standard 2069 (2012) is maintained:

### A) Noise Level

Area	Noise level Leq (Decibel)	
	Day.	Night
Industrial Area	75	70
Commercial Area	65	55
Rural Resd. Area	45	40
Urban Resd. Area	55	50
Mixed Resd Area	63	55
Peaceful Area	50	40

### B) Household Utilities Maximum Noise Production Level

Utilities	Maximum Level ( Decibel)
Water Pump	65
Entertainment Source	90
	70

**Appendix F National Drinking Water Quality Standards, 2006**

Group	Parameter	Unit	Maximum Concentration Limits
Physical and chemicals	Turbidity	NTU	5(10)**
	pH		6.5-8.5**
	Color	TCU	5(15)**
	Taste & Odor		Would not be objectionable
	Total Dissolved Solids	mg/l	1000
	Electrical Conductivity	µc/cm	1500
	Iron	mg/l	0.3(3)**
	Manganese	mg/l	0.2
	Arsenic	mg/l	0.05
	Cadmium	mg/l	0.003
	Chromium	mg/l	0.05
	Cyanide	mg/l	0.07
	Fluoride	mg/l	0.5-1.5*
	Lead	mg/l	0.01
	Ammonia	mg/l	1.5
	Chloride	mg/l	250
	Sulphate	mg/l	250
	Nitrate	mg/l	50
	Copper	mg/l	1
	Total Hardness	mg/l	500
	Calcium	mg/l	200
	Zinc	mg/l	3
	Mercury	mg/l	0.001
Aluminum	mg/l	0.2	
Residual Chlorine	mg/l	0.1-0.2*	
Micro Germs	E-Coli	MPN/100 ml	0
	Total Coli Form	MPN/100 ml	95% in sample

\* These standards indicate the maximum and minimum limits.

\*\* Figures in parenthesis are upper range of the standards recommended.