

# ESIA and ESMP of the Central Asia South Asia Electricity Transmission Project (CASA 1000): Feasibility Stage August, 2011



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## EXECUTIVE SUMMARY

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### BACKGROUND

The Kyrgyz Republic, Tajikistan, Afghanistan and Pakistan are pursuing the development of electricity trading arrangements and the establishment of a Central Asia - South Asia Regional Electricity Market (CASAREM). Since 2005, these four countries have intensified their internal cooperation and with a variety of International Financial Institutions (IFIs), including the World Bank.

A key aim of the CASAREM initiative is the proposed development of a cross-border electrical interconnection linking all four countries to facilitate the transfer of surplus power from the Kyrgyz Republic and Tajikistan, southwards to Afghanistan and Pakistan. The first phase of CASAREM is to establish the necessary transmission and trading infrastructure and systems to enable a trade of 1000 to 1300 MW of electricity between Central Asia and South Asia, and referred to as "CASA-1000". It is envisaged that the major share of this export will be used by Pakistan, while a relatively smaller quantity of power (up to 300 MW) will be imported by Afghanistan. A map of the proposed project is shown on the following page.

A Feasibility study was originally financed by the Asian Development Bank and undertaken by SNC Lavalin of Canada. The study was carried out in two phases, with Phase 1 covering a pre-feasibility assessment of the technical and economic viability of the transmission interconnection, and Phase 2 providing the detailed feasibility analysis of the project. The Phase 1 report was completed in December 2007 and the Phase 2 report in January 2009. An update of the feasibility study was submitted in February 2011.

The Asian Development Bank subsequently suspended their involvement in the project and the World Bank was approached in mid-2009 for continued technical and economic feasibility support by the four CASAREM governments. The World Bank decided to continue the technical and feasibility study by SNC Lavalin. Although some preliminary environmental and social assessments of the CASA 1000 project were undertaken by SNC Lavalin, World Bank practice requires that in a Bank funded project, the engineering consultant cannot also complete environmental and social studies. Rather, they must be conducted by an entirely separate consultant working in close coordination with the engineering firm. The environmental and social assessments are an integral part of the upfront feasibility work that must be presented to potential financiers of the project. The findings on social and environmental safeguards and required mitigation actions are critical for estimating overall project cost and ensuring compliance with World Bank safeguards standards.

In December 2010, the World Bank awarded a contract to Integrated Environments (2006) Ltd. (IEL) of Canada to complete an Environmental and Social Impact Assessment and Environmental Management Plan (ESIA/ESMP) of the CASA 1000 project.

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- The second is the preparation of a comprehensive Environmental and Social Management Plan (ESMP) providing a framework as to how environmental and social impacts of the CASA 1000 Project can be managed during the construction phase, where the majority of impacts are expected to occur. Implementation of the ESMP will ensure that effective mitigation measures are put into place that link to the ESIA, that address data gaps and that provide a process for inclusion of social and environmental provisions into any loan covenants.

Specific objectives of this ESIA/ESMP are to:

- Produce one document summarizing all environmental and social information available for the CASA 1000 project;
- Evaluate project related social and environmental impacts and their associated mitigation measures;
- Produce environmental and social alignment sheets that document environmental and social concerns along the entire 1200 km ROW corridor of the CASA 1000 project;
- Identify data gaps at this project feasibility stage;
- Prepare a feasibility-level environmental and social management plan that will form part of construction contract documents and form the basis of more detailed ESMPs that will follow during design and construction stages;
- Provide guidance on public consultation for the CASA 1000 project during the summer of 2011; and,
- Prepare a generic framework for Land Acquisition and Resettlement Plan for each of the four CASAREM countries and the preparation of individual plans once final route selection has been decided.

## **CASA 1000 AT A GLANCE**

The CASA 1000 Project consists of two separate HVAC and HVDC components:

- A 450 km 500 kV HVAC transmission link between Kyrgyz Republic (430 km) and Tajikistan (20 km) to supply Kyrgyz electricity to South Asia via Tajikistan. About 40% of the route in the Kyrgyz Republic is within 2000 meters masl; the remaining line route ranges between 2000-2300 masl. In Tajikistan, the line lies from 500 masl to about 900 masl. Population centers have been avoided as much as possible, as are enclaves of Uzbekistan and Tajikistan located within Kyrgyz Republic boundaries.
  - A 750 km 500 kV High Voltage Direct Current (HV DC) transmission system between Tajikistan (117 km) through Afghanistan (562 km) to Pakistan (71 km). The proposed ROW has difficult terrain for approximately 160 km with a maximum altitude of 3750 masl. Key population centers along the route include Kabul, as well as the towns of Kunduz, Baghlan, Pul-e-Khumri, Raqi, Mehtar Lam and Jalalabad. Wherever possible, population centers will be avoided. HVDC
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Converter stations are proposed at Sangtuda-1 (1300 MW), Kabul (300 MW) and Peshawar (1000 MW).

The Project has been assigned Category A by the World Bank for the purposes of environmental assessment. The estimated project budget is US\$950 Million.

## **METHODS**

Project methods involved the following:

- Summarize all previous project environmental and social related information and reports from SNC Lavalin (Canada) who completed initial engineering and environmental/social reviews of the CASA 1000 project;
- Using the above, evaluate project related environmental and social impacts and mitigation measures;
- Obtain all existing digital map and other geographic information on the project, including the purchase of 6 m RapidEYE satellite data;
- Prepare alignment sheets using RapidEYE satellite imagery data and ArcGIS with multiple layers of environmental and social data; and
- Prepare a Consultation Guidance Handbook and a Land Acquisition and Resettlement Framework.

## **KEY FINDINGS**

### **ESIA**

The following key findings of the ESIA are noted:

- No significant environmental and social impacts of the CASA 1000 project are predicted that cannot be mitigated by implementation of an Environmental and Social Management Plan (ESMP);
  - Most of the RoW in the Kyrgyz Republic, Tajikistan, Afghanistan and Pakistan is arid, poorly vegetated and supports low biodiversity;
  - Agriculture is found in less than 10% of the RoW in the Kyrgyz Republic and Tajikistan but nonetheless forms an important economic activity;
  - The RoW passes through large areas of agriculture in Afghanistan and Pakistan and compensation may be triggered if reroutes are not possible;
  - Some cultural and religious areas of significance are found along the RoW but impacts can be avoided at the time of final route and site selection;
  - There are no protected areas or forest reserves along the RoW;
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- There are three important bird areas (IBAs) in Tajikistan and Afghanistan (Imam Sahib, Salang Kotal and Jalalabad Valley) where listed bird species have been identified and where special bird protection measures may have to be implemented;
  - Water is considered an important resource along the RoW and the ESMP identifies measures where water sourcing conflicts can be avoided in the construction phase;
  - Mines and unexploded ordnance are a concern in Afghanistan and both community and worker safety are addressed in the ESMP;
  - Privacy of women is an important community issue and steps to protect community integrity are identified in the ESMP, including a worker code of conduct;
  - Area of land to be acquired and number of people affected by the Project will not be known until final route selection is made;
  - No permanent land acquisition is expected for the CASA 1000 Project; however there may be some resettlement and relocation of public infrastructure that will be addressed through the implementation of the LARF/LARP;
  - The focus on go forward should be on minimizing construction impacts and developing a life cycle approach to environmental and social management.

## **ESMP**

The ESMP is a critical companion to the ESIA, providing details on procedures to minimize construction impacts and incorporate them into specific environmental and social management roles and responsibilities for all key Project parties. It identifies key management plans to be developed by Project and the construction contractor. The ESMP should be viewed as a `guidance` document from which specific management plans can be drawn up by either Construction Contractor or the Project Environmental Unit (PMU).

The ESMP contains information on the following:

- Key environmental and social impacts and mitigation practices
  - Roles and responsibilities for environmental and social management
  - Environmental supervision framework
  - Environmental monitoring framework
  - Communication and reporting procedures
  - Training and capacity building requirements
  - Plan monitoring and review procedures
  - EMP Implementation
  - Preliminary EMP costs
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In addition, there are 11 Annexes in Part D containing specifications for a variety of environmental and social procedures to be included into contractor bid documents. Part D, Annex 8 contains information on mine clearance and ensuring the safety of Project personnel.

### **ENVIRONMENTAL ALIGNMENT SHEETS**

One of the earliest limitations of the analysis of CASA 1000 project documentation was the lack of available imagery and photography for the proposed route. Some paper maps were available, but these were outdated. Similarly, the initial field data collection was made without a geo-referenced location so much of this data was not considered to be useful. During the Inception Period review of the Project in January 2011, a recommendation was made to the World Bank to purchase satellite imagery to assist in data review and to provide a geo-referenced platform for further data analysis and compilation. Consequently, 6 m Rapid-Eye satellite imagery was purchased to generate a series of 105 Environmental Alignment Sheets (EAS) at a 1:40,000 scale. The alignment sheets detail environmental and social considerations along the entire CASA 1000 route.

The EASs contain the following information:

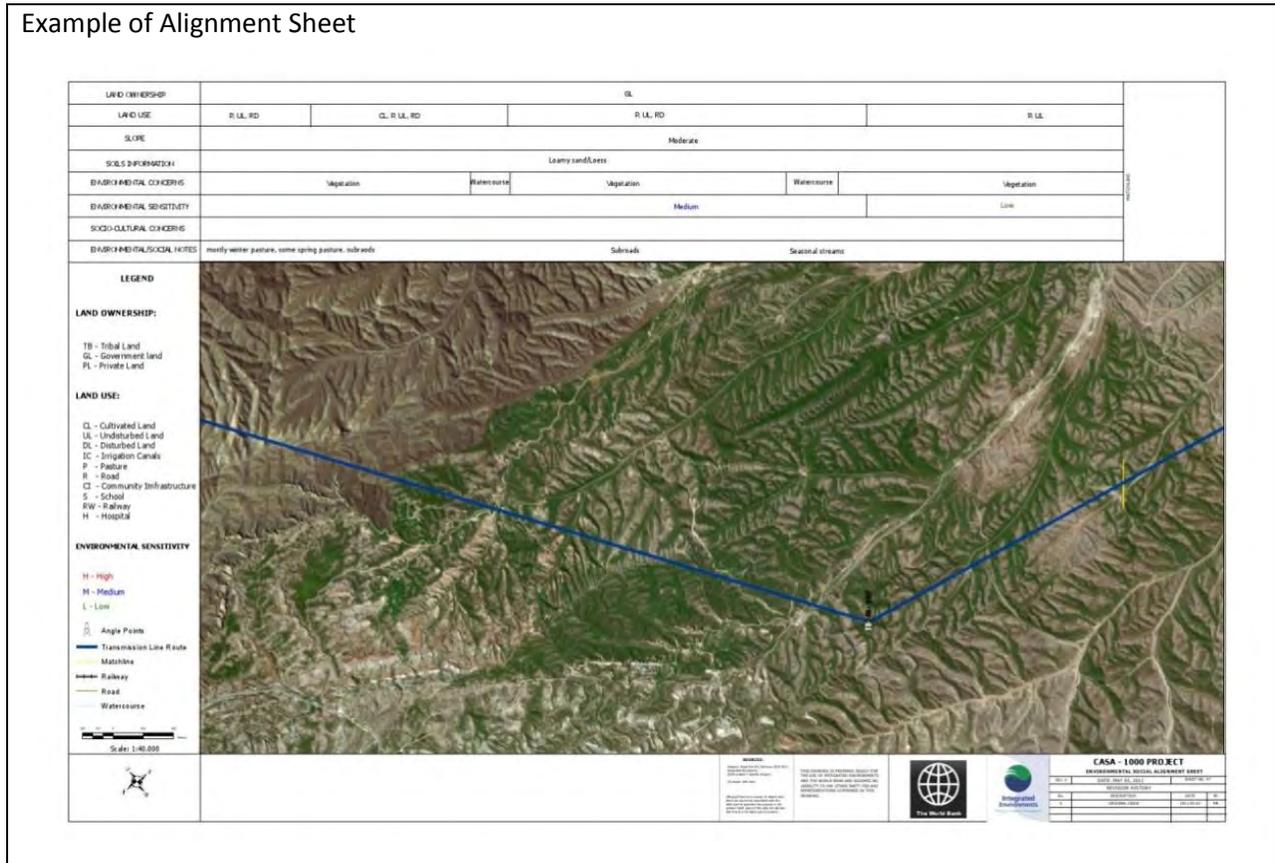
- 6m satellite image photomosaic
- Proposed transmission route location
- Angle points, latitude and longitude locations
- Description of key environmental and social concerns
- Geopolitical information - rivers, roads and railways

Using the data contained in the satellite imagery and assisted by Google Earth and Wikimapia data, the existing field data was interpolated and added to the alignment sheets for data was assembled for seven different categories: Land ownership Land use, Slope, Soils, Environmental Concerns, Environmental Sensitivity and Socio-cultural Concerns. While this information is considered to be preliminary, it is a useful compilation that can be augmented during public consultation and will form a template for analysis of detailed information in the final ESIA once route selection has been determined. The alignment sheets will be a useful tool for use by the Construction Contractor to minimize environmental and social impacts.

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An example of the alignment sheets is presented below.

### Example of Alignment Sheet



### CONSULTATION GUIDANCE PLAN

The Consultation Guidance Plan was designed to assist In-country Consultation Teams in the identification, notification and consultation of project stakeholders. This process will be based on information provided in this ESIA/ESMP. The execution of the consultation process will in turn provide information towards final project appraisal and approval, while at the same time assist in the compliance of World Bank and local consultation requirements.

Central to the success of the implementation of the Consultation Guidance Plan is the selection of the In-country Consultation Team (ICT), their local knowledge of each applicable country, its' regulations and the social environment. Intimate knowledge is to be incorporated into the high level framework that the Plan provides.

The Consultation Guidance Plan states the need for a budget and schedule and details necessary items to ensure the work is done efficiently and in a timely manner. Once these steps have been completed, the validation of existing information will occur. Due to the time lapse since the last phase of consultation, some research performed at arm's length, and the changing social environment, local

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consultants need to confirm that the process used and identified in the Plan is still valid, and that it be updated where necessary.

With the final route not selected, concerted effort must be concentrated in the in the identification of potentially affected parties. As the project is only in its feasibility stage, the notification process is directed towards a larger target, in an attempt to be more exclusive than specifically accurate. This will ensure that people know about the project, that the project may come to fruition, that there is potential that they may be impacted and that specific mitigation measures will be put in place as a result.

The development of communication materials must be done in a timely matter and be ready for the onset of the notification process. The materials must include the most up-to-date project information possible and be provided in a manner suitable for the receiving populations. The communication material should present at a minimum; a project description, project purpose potential impacts and benefits, and contact information.

In addition, a grievance mechanism and communication tracking system shall be created and used to ensure that stakeholders have the opportunity to provide input into the Project, and that they perceive their input is being considered seriously by the Project. Proper management of communication will further assist in the response to Project related commitments and obligations.

The prudent storage and management of stakeholder correspondence is necessary for the successful transfer and utilization of this information for future stages of the Project.

### **LAND ACQUISITION AND RESETTLEMENT FRAMEWORK (LARF)**

The Land Acquisition and Resettlement Framework (LARF) provides guidance on mitigation measures at various stages of the CASA 1000 Project, while acknowledging that the Project Resettlement Action Plan (RAP) is not complete at this time due to a number of information gaps. The LARF is created with the understanding that although some stakeholder and stakeholder environmental and social data have been collected, detailed project affected household and communication information is needed to facilitate the Resettlement Action Plan. The LARF recognizes that although the Project is in the feasibility stage, the amount of time and effort that is necessary for implementation of the Resettlement Action Plan creates an urgency to set the process in motion. The timely execution of the LARF also supports the creation of a cooperative environment with stakeholders prior to project construction.

Although final route selection has yet to be determined, the LARF still needs to be adapted to each country and/or region where it would be applicable. The LARF outlines a number of tasks needed to evolve itself into a full resettlement action plan.

A screening process is to be used to identify project affected peoples and to present information on Project design and schedule. Although consultation is to occur relative to the notification of the Project and potential impacts, the LARF consultation process needs to be separate and facilitated by resettlement experts. The LARF provides a community consultation process that it conforms to

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CASAREM country and World Bank guidelines. In doing so, the LARF outlines the process for information exchange, capacity building and education, promotion of participation, and discussion and negotiation.

To accomplish these steps, a baseline social assessment is needed that includes Right of Way mapping and a census and asset inventory. Information related to all categories of loss as a result of the Project is to be tracked on an entitlement matrix.

The social assessment will identify the households, individuals and communities deemed to be entitled to compensation. In addition, the assessment should uncover all economically displaced peoples who potentially have their livelihood jeopardized as a result of the Project. Once this identification has occurred, initiation of the resettlement strategy incorporating the compensation and the physical resettlement should transpire. Based on existing information, the potential for resettlement associated with the CASA 1000 project is very small.

In order to assess whether the goals of the resettlement and compensation plan are met, monitoring plays an important role. Monitoring must take into account the changing conditions within each project site and allow for planning and implementation revisions to respond to such changes.

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## LIST OF ABBREVIATIONS

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AC	Alternative Current
ADB	Asian Development Bank
AIB	Afghanistan International Bank
APA	Assistant Political Agent
AP	Affected Persons
AREU	Afghanistan Research & Evaluation Unit
BP	Bank Policies
CASA	Central Asia-South Asia
CASAREM	Central Asia-South Asia Regional Electricity Market
CEP	Committee for Environmental Protection
COI	Corridor of Impact
CRM	Conflict/ Complaints Resolution Mechanism
CSE	Construction Supervision Engineer
dB	Decibel
DC	Direct Current
DEM	Digital Elevation Model
DMC	Developing Member Countries
EA	Environmental Assessment
EBRD	European Bank for Reconstruction and Development
ECO	Economic Cooperation Organization
EIA	Environmental Impact Assessment
EMMP	Environmental Management and Monitoring Plan
EMMM	Environmental Mitigation Management Matrix
EMP	Environmental Management Plan
EMF	Electro-magnetic Field
EMI	Electro-magnetic Interference
EMO	Environmental Management Organization
EMS	Environmental Management System
EPA	Environmental Protection Agency
E&SE	Environmental and Social Expert
E&W	Energy and Water
E&WD	Energy and Water Department
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
FATA	Federally Administered Tribal Areas
FCR	Frontier Crimes Regulations
FI	Financial Intermediary
GB	Gigabyte

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GDP	Gross Domestic Product
GIS	Geographical Information System
GoA	Government of Afghanistan
GoT	Government of Tajikistan
GW	Giga Watt
GPS	Global Positioning System
ha	Hectares
HH	Household
HPP	Hydro Power Plant
HVAC	High Voltage Alternate Current
HVDC	High Voltage Direct Current
IDP	Internal Displacement Policy
IEE	Initial Environmental Examination
IEL	Integrated Environments (2006) Ltd.
IEIA	Initial Environmental Impact Assessment
IFC	International Finance Corporation
IFIs	International Financial Institutions
IGC	Inter-governmental Council
IPPs	Independent Power Producers
IPDP	Indigenous Peoples Development Plan
IPDF	Indigenous Peoples Development Framework
ILO	International Labor Organization
IRP	Involuntary Resettlement Policy
IsDB	Islamic Development Bank
ISIA	Initial Social Impact Assessment
Kg	Kilograms
Km	Kilometers
kV	Kilo volts
LAA	Land Acquisition Act
LARP	Land Acquisition Resettlement Plan
LARF	Land Acquisition and Resettlement framework
m	Meters
MAPA	Mine Action Program of Afghanistan
MASL	Mean above Sea Level
MCWG	Multi Country Working Group
MoE&W	Ministry of Energy and Water
MOU	Memorandum of Understanding
MMM	Mitigation Management Matrix
MW	Mega Watt
NEB	National Energy Board
NEPA	National Environmental Protection Agency
NEQS	National Environmental Quality Standards

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NGO	Non-Governmental Organization
NRP	National Resettlement Policy
NTDC	National Transmission & Dispatch Company
NWFP	North West Frontier Province
OD	Operational Directive
OM	Operational Manual
OP	Operational Procedures
OMS	Operational Manual Statements
OD	Operational Directives
PA	Political Agent
PAC	Project Affected Committee
PAPs	Project Affected Persons or People
PC/C	Proponent Contractor/ Consultant
PEO	Project Environmental Officer
PIP	Participant Involvement Plan
PIU	Project Implementation Unit
PMU	Project Management Unit
PPE	Personal Protective Equipment
PS	Performance Standard
RAP	Resettlement Action Plan
RF	Russian Federation
RoW	Right of Way
RP	Resettlement Plan
RPF	Resettlement Policy Framework
RTE	Rare, Threatened or Endangered
SES	Safety Environment Supervisor
SEO	Site Environmental Officer
SIA	Social Impact Assessment
SNC	SNC Lavalin
SRTM	Shuttle Radar Topographic Mission
TOR	Terms of Reference
T/L	Transmission Line
TSS	Total Suspended Solids
TSP	Total Suspended Particles
UN	United Nations
UNESCO	United Nations Education Scientific and Cultural Organization
UNMACA	United Nations Mine Action Centre for Afghanistan
UXO	Unexploded Ordinance
WB	World Bank
WHO	World Health Organization

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## PART A: INTRODUCTION

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## 1. PROJECT CONTEXT

The Kyrgyz Republic, Tajikistan, Afghanistan and Pakistan are pursuing the development of electricity trading arrangements and the establishment of a Central Asia - South Asia Regional Electricity Market (CASAREM). Since 2005, these four countries have intensified their internal cooperation and engaged with International Financial Institutions (IFIs), comprising the Asian Development Bank (ADB), the European Bank for Reconstruction and Development (EBRD), the International Finance Corporation (IFC), the Islamic Development Bank (IsDB) and the World Bank (WB).

One of the key components of the CASAREM initiative is the proposed development of a cross-border electrical interconnection linking the four countries to facilitate the transfer of surplus power that would be made available in the Kyrgyz Republic and Tajikistan, southwards to Afghanistan and Pakistan. The first phase of CASAREM is to establish the necessary transmission and trading infrastructure and systems to enable a trade of 1000 to 1300 MW of electricity between Central Asia and South Asia, and referred to as "CASA-1000". It is envisaged that the major share of the export will be used by Pakistan, while a relatively smaller quantity of power (up to 300 MW) will be imported by Afghanistan. Pakistan has expressed interest in increasing electricity imports over the medium to long term.

A Feasibility study was financed by the Asian Development Bank and undertaken by SNC Lavalin of Canada. The study was carried out in two phases, with Phase 1 covering a pre-feasibility assessment of the technical and economic viability of the transmission interconnection, and Phase 2 providing the detailed feasibility analysis of the project. The Phase 1 report was completed in December 2007 and the Phase 2 report in January 2009<sup>1</sup>. An update of the feasibility study was completed in February 2011<sup>2</sup>.

The Asian Development Bank subsequently suspended their involvement in the project and the World Bank was approached in mid 2009 for continued technical and economic feasibility support by the four CASAREM governments. The World Bank decided to continue the technical and feasibility study by SNC Lavalin.

Although some preliminary environmental and social assessments of the CASA 1000 project were undertaken by SNC Lavalin, World Bank practice requires that in a World Bank funded project, the engineering consultant cannot also be responsible for completing environmental and social studies. Rather, they must be conducted by an entirely separate consultant working in close coordination with the engineering consultant. The environmental and social assessments are an integral part of the upfront feasibility work that must be presented to potential financiers of the project. The findings on social and environmental safeguards and required mitigation actions are critical for estimating overall project cost and ensuring compliance with World Bank safeguards standards.

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<sup>1</sup> SNC Lavalin (2009e). Techno-Economic Feasibility Study for the Central Asia-South Asia Transmission Interconnection (CASA-1000). Final Phase 2 Report. CASA 1000 Transmission Line Project, Transmission and Distribution Division. SNC-Lavalin International Inc.

<sup>2</sup> SNC Lavalin (2011). Central Asia-South Asia Electricity Transmission and Trade (CASA-1000). Project Feasibility Study Update. CASA 1000 Transmission Line Project, Transmission and Distribution Division. SNC-Lavalin International Inc.

In December 2010, the World Bank awarded a contract to Integrated Environments (2006) Ltd. (IEL) of Canada to complete an Environmental and Social Safeguards Assessment of the CASA 1000 project.

The Environmental and Social Safeguards Assessment of the CASA Project has five main components:

- A summary of the above four initial environmental and social assessments prepared by SNC Lavalin for the four CASAREM countries follows (these documents are collectively referred to as Environmental and Social Assessments or ESIA);
- An Environmental and Social Management Plan (ESMP) for the entire CASA 1000 project. Building on the initial environmental assessments, the ESMP provides a planning framework as detailed as current engineering design status will permit. In addition the ESMPs will be used as templates for the safeguards provisions for contractual arrangements for detailed design and construction of the transmission line, and subsequent, more detailed environmental and social management plans to be prepared during project implementation;
- A Consultation Guidance Handbook to assist in ongoing consultation of the Project;
- A Resettlement and Compensation Framework; and
- Environmental and Social Alignment Sheets of the proposed CASA 1000 transmission lines that document environmental and social concerns along the entire route.

How does this assessment differ from the initial environmental assessments completed by SNC Lavalin?

It builds on the existing environmental and social information of the Lavalin reports and adds two new important components at this project feasibility stage:

- The first is the preparation of environmental and social alignment sheets for the entire CASA 1000 project. These alignment sheets use newly acquired satellite imagery to assess potential environmental and social concerns along the entire CASA right-of-way (ROW). The alignment sheets form the basis of the conclusion that minimal environmental and social impacts are expected from construction and operation of the CASA 1000 project. The alignment sheets also provide site specific instructions to the Construction Contractor as to how these concerns can be successfully mitigated during construction.
- The second is the preparation of the Environmental and Social Management Plan (ESMP). The ESMP provides the most efficient way of managing construction related impacts of the CASA 1000 Project. It also provides a framework for decision making once final route selection has been made for final tower location, access roads and camp placement including compliance supervision and monitoring. It is an important link to both the alignment sheets and the initial environmental and social assessments to ensure effective impact management.

Previous Initial Environmental and Social Assessments for each of the four CASAREM countries were completed by SNC Lavalin, Canada as part of an initial technical and economic appraisal of the Project<sup>3 4</sup>  
5 6 7 8 9 10

Figure A1-1 shows a process flow chart of the CASA 1000 project to date, including the chronology as to how this report fits in relative to past and future phases.

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3 SNC Lavalin (2009a). Initial Environmental Impact Assessment (Afghanistan). CASA 1000 Transmission Line Project, Transmission and Distribution Division. SNC-Lavalin International Inc.

4 SNC Lavalin (2009b). Initial Social Impact Assessment (Afghanistan Section). CASA 1000 Transmission Line Project, Transmission and Distribution Division. SNC-Lavalin International Inc.

5 SNC Lavalin (2009c). Initial Environmental Impact Assessment. Torkhum to Peshawar (Pakistan). CASA 1000 Transmission Line Project, Transmission and Distribution Division.

6 SNC Lavalin (2009d). Initial Social Impact Assessment. Torkhum to Peshawar (Pakistan). CASA 1000 Transmission Line Project, Transmission and Distribution Division. SNC-Lavalin International Inc.

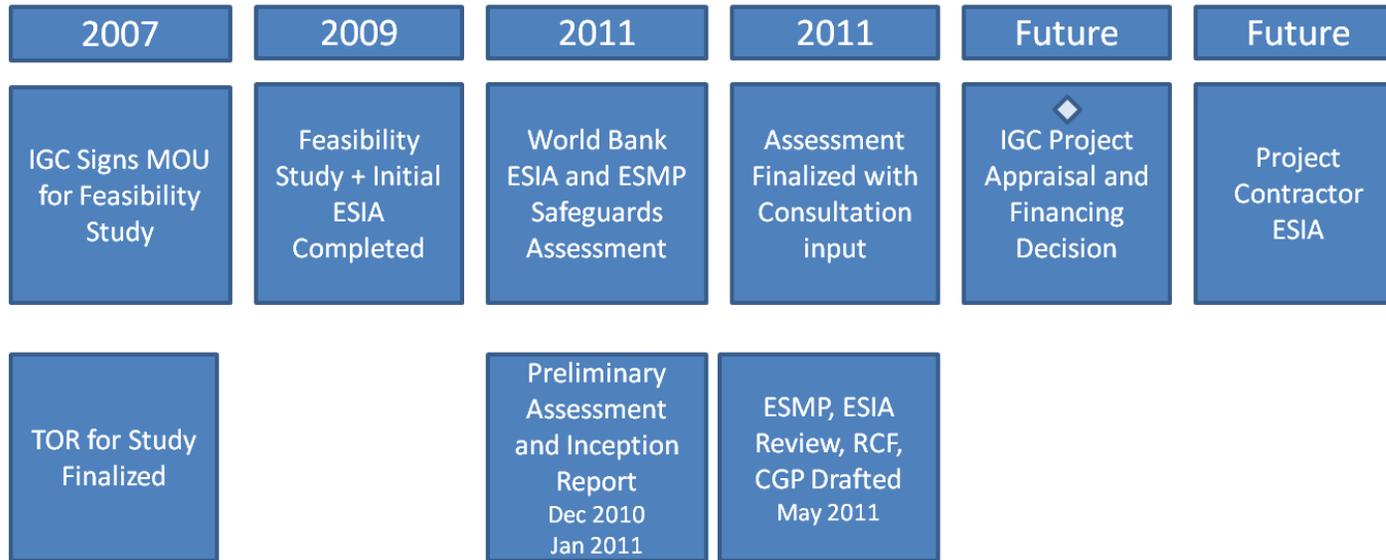
7 SNC Lavalin (2009e). Techno-Economic Feasibility Study for the Central Asia-South Asia Transmission Interconnection (CASA-1000). Final Phase 2 Report. CASA 1000 Transmission Line Project, Transmission and Distribution Division. SNC-Lavalin International Inc.

8 SNC Lavalin (2009f). Initial Social Impact Assessment (Tajikistan). CASA 1000 Transmission Line Project, Transmission and Distribution Division. SNC-Lavalin International Inc.

9 SNC Lavalin (2009g). Initial Environmental Impact Assessment (Tajikistan). CASA 1000 Transmission Line Project, Transmission and Distribution Division. SNC-Lavalin International Inc.

10 SNC Lavalin (2009h). Initial Environmental and Social Impact Assessment. HVAC Transmission Interconnection between Tajikistan and the Kyrgyz Republic. Draft Report. CASA 1000 Transmission Line Project, Transmission and Distribution Division. SNC-Lavalin International Inc.

**Figure A1-1: CHRONOLOGY OF THE CASA 1000 PROJECT TO DATE**



## 2. CASA 1000 AT A GLANCE

The CASA 1000 Project consists of two components:

- A 450 km 500 kV HVAC transmission link between Kyrgyz Republic (425 km) and Tajikistan (25 km) to supply Kyrgyz electricity to South Asia via Tajikistan. The route begins at the Datka substation in the Kyrgyz Republic and terminates at the Khoudjand substation in Tajikistan. In the Kyrgyz Republic, about 40% of the route runs within 2000 meters above sea level (masl) altitude. The remaining line route ranges between 2000-2300 masl. In Tajikistan, the line route runs at an altitude ranging from 500 masl to about 900 masl. Population centers have been avoided as much as possible, as are enclaves of Uzbekistan and Tajikistan located within Kyrgyz Republic boundaries.
- A 750 km 500 kV High Voltage Direct Current (HV DC) transmission system between Tajikistan (117 km) through Afghanistan (562 km) to Pakistan (71 km). The HVDC line begins at the Sangtuda Hydropower Plant in Tajikistan and extends south via Kurgan-Tyube and Dusti (both in Tajikistan) and crosses into Afghanistan near Nizhny. From there, the corridor proceeds via Kunduz, Pul-e-khumri, Dowshi, Khanjan, the Salang Pass and Charika to the outskirts of Kabul. From Kabul the corridor goes east to Peshawar (Pakistan) via Jalalabad (Afghanistan). The proposed ROW has difficult terrain for approximately 160 km with a maximum altitude of 3750 masl. Key population centers along the route includes Kabul, as well as the towns of Kunduz, Baghlan, Pul-e-Khumri, Raqi, Mehtar Lam and Jalalabad. Wherever possible, population centers will be avoided. HVDC Converter stations are proposed at Sangtuda-1 (1300 MW), Kabul (300 MW) and Peshawar (1000 MW).

The Project has been assigned Category A by the World Bank for the purposes of environmental assessment. The estimated project budget is US\$950 Million<sup>11</sup>.

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<sup>11</sup> World Bank (2011). Project Information Document. Report No. 61325. World Bank.



### 3. THE PURPOSE OF THIS ASSESSMENT

The purpose of this ESIA/ESMP is to assess existing environmental and social information for the CASA 1000 project, including associated project baseline, impacts, mitigation and management measures and develop measures as to how these impacts can be effectively managed during construction and operation. A key part of this analysis is the production of environmental and social alignment sheets using new 6 m satellite imagery purchased for the entire route (see sidebar). No new field studies or ground based investigations were completed as part of this assessment.

Specific objectives of the project are to:

- Summarize environmental and social baseline information for the CASA 1000 project;
- Evaluate and assess social and environmental impacts and identify, where possible, additional data needs in support of final route selection;
- Prepare a generic environmental and social management plan (ESMP) framework to management construction related impacts. The ESMP will form part of construction contract documents and form the basis of more detailed environmental and social management plans prepared by the Construction Contractor;
- Use new satellite information to produce environmental and social alignment sheets that document environmental and social concerns and impact management measures along the entire 1200 km ROW corridor of the CASA 1000 project;
- Provide guidance on public consultation for the CASA 1000 project that will be completed by the four host country governments during 2011; and
- Develop a generic framework Compensation and Resettlement Plan that can be adopted for each of the four countries to implement a World Bank compliant Resettlement and Compensation Framework.
- Produce a single document that can be used as part of future public consultation efforts.

Why are the alignment sheets important?

The environmental and social alignment sheets provide site specific environmental and social information at a 1:40,000 scale along the entire right-of-way of the CASA 1000 Project. They have been derived from existing route information and new 6m GeoEye Satellite imagery supplemented by 1m information available from Google Earth.

The alignment sheets provide a new analysis of environmental and social concerns along the RoW. They also provide site specific management measures that are linked to environmental and social protection measures of the Environmental and Social Management Plan (ESMP).

The alignment sheets are a tool to be used by the Construction Contractor to minimize site specific environmental and social impacts during the construction phase.

They are intended to be a living document to be added to as more information becomes available.



## 4. HOW THE REPORT IS ORGANIZED

The report is divided into a series of parts that include a number of sections. The report also includes hyperlinks in the Table of Contents which will take the reader directly to the section of interest.

Each part corresponds to a component of the Project as described as follows:

<b>Executive Summary</b>	A high level overview of the CASA 1000 Projects, its key environmental and social impacts and how they can be managed.
<b>Part A: Introduction</b>	Provides a general background to the report, its purpose and how it's Parts and Section are structured and organized.
<b>Part B: Project Description</b>	Summarizes the project engineering details within each of the four CASAREM countries.
<b>Part C: ESIA</b>	<p>Assesses environmental and social impacts of the CASA 1000 Project including legal and regulatory framework, environmental and social setting, key risks and impacts and a data gas analysis for each CASAREM country – Kyrgyz Republic, Tajikistan, Afghanistan and Pakistan. Information for the ESIA is drawn from previously completed initial environmental and social assessments by SNC Lavalin.</p> <p>A key part of the assessment of project impacts is the use of environmental and social alignment sheets depicting environmental and social information and concerns within the entire CASA 1000 project ROW. New 6 m satellite imagery was acquired for this purpose.</p> <p>An introduction to the Alignment Sheets is provided in Part G of this report. The 105 alignment sheets at a 1:40,000 scale are</p>
<b>Part D: ESMP</b>	<p>The Environmental and Social Management Plan (ESMP) provides a framework as to how construction impacts of the CASA 1000 project can be mitigated and how the Construction Contractor can be managed to ensure compliance with environmental and social management provisions. The ESMP contains the following:</p> <ul style="list-style-type: none"> <li>▪ Roles and responsibilities</li> <li>▪ Environmental supervision and compliance framework</li> <li>▪ Environmental monitoring framework</li> <li>▪ Communication and reporting procedures</li> <li>▪ Capacity building and training</li> <li>▪ ESMP review</li> <li>▪ Implementation plan</li> <li>▪ ESMP Costs</li> </ul>

**Part D: ESMP Annexes**

In addition, the ESMP contains 13 annexes containing valuable environmental and social management plan frameworks including the following:

- Environmental and social specifications for contractors
- Workforce and site installation
- Site preparation and restoration
- Construction impact management
- Waste management
- Pollution prevention
- Aesthetics and ecological management
- Safety management, including land mine safety
- Physical cultural property
- Community relations and health management
- Transmission line design
- Environmental supervision
- Independent environmental monitoring

**Part E: LARF**

The Land Acquisition and Resettlement Framework (LARF) provides a framework as to how land will be acquired for the CASA 1000 Project, what compensation measures will be put in place and how resettlement, expected to be minimum, will be completed

**Part F: Consultation Guidance**

A framework plan is presented as to how ongoing consultation for the CASA 1000 Project should be conducted and how consultation results should be incorporated.

**Part G: Environment & Social Alignment Sheets**

Presents all 105 alignment sheets at a 1:40,000 scale that document environmental and social concerns along the CASA 1000 T/L and how they can be managed.

The Alignment Sheets are considered to be a useful tool for the Construction Contractor.

**Part H: References**

## 5. PREVIOUS ENVIRONMENTAL AND SOCIAL ASSESSMENTS

Previous Initial Environmental and Social Assessments for each of the four CASAREM countries were completed by SNC Lavalin, Canada as part of an initial technical and economic appraisal of the Project<sup>12</sup>  
13 14 15 16 17 18 19

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12 SNC Lavalin (2009a). Initial Environmental Impact Assessment (Afghanistan). CASA 1000 Transmission Line Project, Transmission and Distribution Division. SNC-Lavalin International Inc.

13 SNC Lavalin (2009b). Initial Social Impact Assessment (Afghanistan Section). CASA 1000 Transmission Line Project, Transmission and Distribution Division. SNC-Lavalin International Inc.

14 SNC Lavalin (2009c). Initial Environmental Impact Assessment. Torkhum to Peshawar (Pakistan). CASA 1000 Transmission Line Project, Transmission and Distribution Division.

15 SNC Lavalin (2009d). Initial Social Impact Assessment. Torkhum to Peshawar (Pakistan). CASA 1000 Transmission Line Project, Transmission and Distribution Division. SNC-Lavalin International Inc.

16 SNC Lavalin (2009e). Techno-Economic Feasibility Study for the Central Asia-South Asia Transmission Interconnection (CASA-1000). Final Phase 2 Report. CASA 1000 Transmission Line Project, Transmission and Distribution Division. SNC-Lavalin International Inc.

17 SNC Lavalin (2009f). Initial Social Impact Assessment (Tajikistan). CASA 1000 Transmission Line Project, Transmission and Distribution Division. SNC-Lavalin International Inc.

18 SNC Lavalin (2009g). Initial Environmental Impact Assessment (Tajikistan). CASA 1000 Transmission Line Project, Transmission and Distribution Division. SNC-Lavalin International Inc.

19 SNC Lavalin (2009h). Initial Environmental and Social Impact Assessment. HVAC Transmission Interconnection between Tajikistan and the Kyrgyz Republic. Draft Report. CASA 1000 Transmission Line Project, Transmission and Distribution Division. SNC-Lavalin International Inc.



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## PART B: PROJECT DESCRIPTION

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## PROJECT DESCRIPTION

This section gives an overview of the CASA 1000 project design, construction, operation, and general safety procedures for both the 500 HVAC and 500 HVDC cross-border interconnection lines across all four CASAREM countries. Both projects are currently in the feasibility stage.

### 1. COUNTRY ENERGY DEMAND/PRODUCTION CAPACITY

#### 1.1 KYRGYZ REPUBLIC

With reference to the existing and committed supply, the Kyrgyz Republic's existing system is mainly hydro (2,910 MW, 85 %), with some thermal plants (530 MW, 15 %) providing additional power generation capacity in dry seasons and peak periods.

- **Thermal Plants:**

The thermal system generating capacity for the Kyrgyz is sourced mostly from the Bishkek plant, with minor contribution from the Osh plant. These plants are old, have very high variable cost, and are mainly used during winter. The capacities shown reflect the projected rehabilitation and the maximum attainable energy production; however the plants are not being considered as a source for exports to CASA 1000.

- **Hydro Plants:**

The hydro system relies on the Toktogul reservoir and hydro power plant (1,200 MW, 5,110 GWh/year). Downstream plants benefit from Toktogul's turbined outflow as a regulated inflow, and provide a considerable amount of annual energy (7,235 GWh).

With no generation expansion and an increasing demand, the Kyrgyz surplus is expected to drop from about 2,150 GWh of annual surplus in 2010 to less than 400 GWh by 2035.

#### 1.2 TAJIKISTAN

Tajikistan possesses considerable hydropower resources. About 55% of the total water resources of Central Asia are in Tajikistan. The total hydropower potential of the country (mainly in the south) is estimated at 527 billion kWh per annum. For the time being, the country uses only 6.6% of its potential. Within the fuel and energy balance structure, hydropower resources make up more than 90%. The considerable hydropower potential of the country could allow the country to increase power sales and exports and develop energy-intensive industries.

Currently, the country annually produces more than 17 billion kWh of power, of which 99 % is from hydroelectric resources. The major power generation source is the Nurek hydropower station, which at times cannot operate at its full capacity due to low water volume in its' reservoir. Easier access to the distribution networks of OJSC Barki Tojik would improve power supply to new consumers. Construction

of new power plants (e.g., Sangtuda hydropower stations 1 and 2, Rogun HPS for a total capacity of 3600 MW, to be commissioned between 2015 and 2021) will improve power supply security especially in the winter period and will create conditions suitable for summer export of surplus electric power.

Considering the commissioning schedule of the proposed power plants in Tajikistan and taking into account the high electricity demand during the winter period in Tajikistan, it is envisaged that during the initial years of the CASA-1000 project, there will be little surplus energy available for export to Pakistan and Afghanistan, particularly during the winter months. However, once the proposed plants will be commissioned, sufficient energy should be available for export.

With no generation expansion and an increasing demand, the Tajik surplus is expected to drop from 3,750 GWh to about 500 GWh in 2035.

### **1.3 AFGHANISTAN**

Presently, the Afghan power system is connected to those of its Northern neighbors; the Central Asian Republics of Tajikistan, Turkmenistan, and Uzbekistan. The total installed generation capacity in Afghanistan is about 475 MW including 261 MW from hydropower, 151 MW from thermal and 63 MW from diesel engines.

Currently the generation capacity of Afghanistan is only about 270 MW, as numerous facilities have been destroyed during recent conflicts. Transmission constraints add to the problem, as peak generation output cannot be delivered to the demand centers.

With a fast growing population of 4 to 5 million people, Kabul is facing erratic power supply due to years of war and chaos in the country. The lack of development of power supply infrastructure over the previous years has also compounded the problem of electricity supply to the region.

From the data available on the loading of substations, the maximum total load on the substations in the Kabul region in 2010 was 197 MW. However, this figure does not represent the full power demand of Kabul, as substantial demand in the Kabul region may be suppressed.

In regards to electricity demand in the future, The Ministry of Energy and Water projects that the demand of electricity in the Kabul region will be about 500 MW by the year 2013<sup>20</sup>. The demand forecast provided in the Power Sector Master Plan developed by Norconsult gives the Kabul forecast as 260 MW and 347 MW in the years 2015 and 2020 respectively<sup>21</sup>. The forecast of the whole country is 905 MW for the year 2020. The most recent (2007) forecast available is from Global Edison<sup>22</sup>. It provides the demand forecast for the Kabul region as 384 MW and 591 MW for the years 2015 and 2020 respectively. For the

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<sup>20</sup> Report on Power Sector Strategy for the Afghan Development Strategy, Ministry of Energy and Water, April 2007

<sup>21</sup> Power Sector Master Plan, Demand Forecast, Norconsult, October 2004.

<sup>22</sup> Power Demand in Afghanistan (2005 – 2025), Global Edison Corporation, Texas, USA

whole country the demand projections are 761 MW and 1099 MW for the years 2015 and 2020 respectively.

In the case where all of the existing power plants were rehabilitated and planned power plants are commissioned, the domestic power capacity in Afghanistan would increase to over 1400 MW by 2015. However, considering 200 MW will be consumed by the Aynak copper mine, the power available for the grid will be about 1200 MW. Moreover, considering that lead time of hydro plants are long, the likelihood of the completion of Surobi II, Baghdara, Kajakai and Salma hydro plants is unlikely before 2015. Therefore, in case the generation capacity of these plants is excluded, the generation supply from domestic plants will be approximately 644 MW in 2015.

In regards to importing power from neighbouring countries, if the planned transmission lines are commissioned, the import capacity would increase to about 900 MW by 2015. Considering the power demand forecast of the country to be 761 MW in the year 2015 and taking into account the generation supply available in year 2015 of 1544 MW, it becomes obvious that if all the planned projects excluding the hydro projects, and all the import plans are implemented on time, Afghanistan will have a surplus of 783 MW. If required, this surplus energy can be exported to Pakistan as it is envisaged that it will continue to have power shortages in the foreseeable future.

The HVDC Transmission Line can provide up to 300 MW of power into the grid at Kabul.

## **1.4 PAKISTAN**

The electricity sector of Pakistan is facing acute shortages in supply which have led to power outages on a large scale. The Government of Pakistan is taking diverse measures to circumvent the problem of capacity shortage. These include expansion and refurbishment of existing plants, induction of new power plants - mainly in the private sector, encouragement of renewable energy, development of rental power plants, and acquisition of power from captive power plants.

At the end of financial year 2008-09, the total installed generation capacity in the country was 20,306 MW. The share of thermal, hydro and nuclear capacities was 13,370 MW, 6,474 MW and 462 MW respectively.

On the basis of the generation capacity expansion plan, a relatively significant capacity would be added during the period 2014 to 2016. This will mainly be from the commissioning of large capacity coal-fired power stations at Thar and Karachi. In addition, large hydro stations, namely Bunji and Basha, are planned to be commissioned during the period 2018-19 to 2021-22. The CASA 1000 transmission line is projected to be commissioned in the year 2016. This implies a forecast of about 1000 MW of import from the CASA line from 2016 onwards.

The electricity demand in Pakistan is growing at a rapid pace due to an increase in the population and an increase in the demand for power in all sectors of the economy.

The Supply-Demand assessment indicates that if all of the planned capacity is realized, there would be a shortage in the generation capacity during the period 2010-11 to 2014-15 and then during the period 2023-24 to 2028-29. However, In view of the huge capital requirements and institutional issues, it might be difficult to build all the generation capacity as planned. In particular, for large capacity coal-fired and hydro plants, a significant investment will be required, which will be difficult to obtain. Therefore, the likelihood of delays in commissioning of these projects cannot be ignored. In such a scenario, the construction of the CASA 1000 transmission line would contribute in alleviating the shortage of electrical generation capacity in Pakistan.

## **2. TRANSMISSION LINE ROUTE**

As the CASA 1000 transmission interconnection project is still in the feasibility stage, this section provides an overview of its route. It is important to note that at this Project Feasibility Stage, neither the final centerline, nor the final location of towers has been identified.

The proposed transmission line corridor has been established, based on a site reconnaissance and preliminary Environmental and Social Impact Studies and is shown on 1:40,000 scale alignment sheets (see Part G).

### **2.1 DESCRIPTION OF 500 HVAC TRANSMISSION LINE ROUTE**

The route begins at the Datka substation in the Kyrgyz Republic and terminates at the Khoudjand substation in Tajikistan. The total length of the transmission line is 450 km, out of which 425 km passes in the South-Western Kyrgyz Republic and the remaining 25 km lies in Tajikistan.

The Corridor of Impact (COI) has been identified as approximately 2 km wide between Kyrgyzstan and Tajikistan for the 500 HVAC transmission line.

Detailed descriptions of the 500 HVAC transmission line route can be found in the ESIA's for the Kyrgyz Republic and Tajikistan in Part C of this report. High resolution satellite imaging of the proposed route is included in Appendix 3.

### **2.2 DESCRIPTION OF 500 HVDC TRANSMISSION LINE ROUTE**

The HVDC route begins at the Sangtuda Hydropower Plant in Tajikistan and extends south, crossing into Afghanistan near Nizhny. From there, the corridor proceeds via the Salang Pass and Charika to the outskirts of Kabul. From Kabul the corridor goes east to Peshawar (Pakistan) via Jalalabad (Afghanistan). The proposed ROW has difficult terrain for approximately 160 km with a maximum altitude of 3800 masl. Key population centers along the route includes Kabul, as well as the towns of Kunduz, Baghlan, Pul-e-Khumri, Raqj, Mehtar Lam and Jalalabad. HVDC Converter stations are proposed at Sangtuda-1 (1300 MW), Kabul (300 MW) and Peshawar (1000 MW). The route traverses 117 km in Tajikistan, 562 km across Afghanistan and finally 71 km in Pakistan.

The Corridor of Impact (COI) has been defined as 2 km wide across Tajikistan, Afghanistan and Pakistan for the 500 HVDC transmission line.

Detailed descriptions of the 500 HVDC transmission line route can be found in the ESIA's for the Tajikistan, Afghanistan and Pakistan in Part C of this report. High resolution satellite imaging of the proposed route is included in Appendix 3.



### **3. RIGHT OF WAY (ROW)**

The RoW is the strip of land along either side of the centerline. Vegetation within the RoW is not allowed to grow to a height above 3 m and no permanent structures shall be constructed within the RoW. Proper clearance to ground and other structures has to be maintained. The total width of this RoW will be 50 to 60 m (25 to 30 m on both sides). The RoW is not to be used for public road access. Any maintenance road access should be on the edge of the RoW so as not to encroach on the design clearances required.



#### **4. PROPOSED CONVERTER STATIONS (HVDC LINE ONLY)**

At each end of the transmission line, converter stations will be built to transform alternative current (AC) used in the national networks into direct current (DC) for transmission at high voltage and vice versa. The converter stations will measure approximately 400 m X 400m.

The converter stations will require road or rail access for heavy components such as converter transformers (which can weigh 160 tons or more). The converter stations will likely have a permanent staff of 15 to 20 highly skilled and semi-skilled staff at each location. These staff will require permanent housing, likely in a local community. The converter station will be provided with oil containment and fire protection as required. Light and noise mitigation will be provided as required. The converter stations will require septic fields and all discharges such as runoff water should be monitored and recorded.



## **5. PROPOSED ELECTRODE LINE AND GROUND ELECTRODE (HVDC LINE ONLY)**

A suitable location for a ground electrode close to the converter station, but at least 5 km away must be found. Usually it is found within a 20 to 30 km radius of the converter station. It must have low soil resistance in both the upper and lower soil layers and have an adequate supply of moisture. It must be buried below the frost line and may be required to be fenced by non-conductive fencing. An area around the electrode up to 5 km should be reviewed for possible corrosion of metallic underground structures.

A DC electrode line and RoW will be required from the converter station to the ground electrode. It will require two conductors and may be steel poles/towers. It is usually designed to a standard 25 kV or 35 kV distribution line, but will require studies to determine this.



## 6. DESIGN ASPECTS

This section provides general design information as specific details will be developed during the detailed design phase.

### 6.1 DESIGN STANDARDS AND CODES

Internationally accepted design standards/codes will be used for the CASA 1000 transmission line. Internationally accepted standards, guides from IEEE, IEC or CIGRE and best industry practices are to be utilized in the design of the converter stations and ground electrodes. The designs are to use overall life cycle costing to provide the best overall solution and mitigate Operating and Maintenance costs.

### 6.2 CLIMATIC CONDITIONS

During design of the transmission line, the following climatic conditions are to be considered: maximum, minimum and average temperatures; maximum wind speed; maximum ice thickness on conductors; and combined ice thickness and wind speed. Severe weather events and period of re-occurrence/risk should be considered to determine practicality of implementation. Isokronic levels (Lightning strikes) are to be considered in the design, as are the use of automatic restarts if allowed by the system.

### 6.3 CONDUCTORS AND LINE CONFIGURATION

A DC Transmission Line has two conductors, with each conductor called a “pole.” The proposed T/L is a +/- 500 kV DC line with each pole consisting of a bundle of four ACSR “Falcon” conductors, as required to meet the Electro-Magnetic Interference (EMI), also called Radio Interference Voltage (RIV) and Electrical Fields. Sky wires may be employed for high isokronic levels. The Electrode line will also use two conductors and may use steel poles instead of wood for reliability reasons. The electrode line conductors will likely be different than the main transmission line because of lesser field effects at lower voltages. Two poles are supported by insulators attached to cross-arms of the tower.

### 6.4 TOWERS

A minimum of five tower types are required for the line:

- Tangent Suspension Tower -used for no line angle/small line angle up to 2 deg.
- Small Angle Suspension Tower-used for line angles from 2 deg. to approx. 10 deg.
- Medium Angle Tension Tower-used for line angles from approx. 10 deg. to approx. 45 deg.
- Heavy Angle Tension Tower-used for line angles from 45 deg. to 90 deg.
- Terminal Tower-used at the line terminals and as anti-cascade towers at intervals along the line.

The distance between towers will be between 350 m and 400 m. The average height will be about 35 m. The average “foot print” of each tower will be 10 m X 10 m.

Higher towers and longer distances between towers may be required for rugged terrain and river crossings etc. The type of footing required will depend on the soil type (poor, average, good) , the terrain and soil stability.

The approximate number of towers expected to be required in each country is as follows:

- Kyrgyz Republic            1050 Towers
- Tajikistan                    310 Towers (10 for the HVAC line, 300 for the HVDC line)
- Afghanistan                1200 Towers
- Pakistan                      150 Towers

## **7. SAFETY PARAMETERS**

### **7.1 SAFETY SYSTEM**

The Contractor will adopt standard industry safety practices during construction including:

- Providing safety training for all employees;
- Supplying personal protective equipment;
- Employing Safety inspectors to monitor compliance;
- Regularly inspecting and maintaining equipment;
- Holding tailboard meetings on a periodic basis discussing risks and measures required to minimize them; and
- Considering the Contractor's safety records in the evaluation process.

### **7.2 PUBLIC SAFETY**

The Contractor will be responsible for the safety of the public during construction. The Contractor will implement appropriate mitigation measures to ensure the public is not injured by construction equipment or activities.

The converter stations will be fenced to restrict public access. The electrode site may have to be fenced with non-metallic fencing depending on the design or other mitigated measures implemented.



## **8. CONSTRUCTION ASPECTS**

### **8.1 CONTRACTOR'S ARRANGEMENT**

For the HVDC line, an overarching Project Management Unit (PMU) is expected to be set up in Tajikistan, Afghanistan, and Pakistan where the agency will be responsible for the construction and commissioning of the T/L. No similar information is provided for the HVAC transmission line but a similar PMU structure is recommended.

### **8.2 WORK FORCE**

The amount of workers will vary throughout construction activities. Approximately 10% of workers will be expatriate specialists, 20 to 30% will be local skilled staff and the remainder will be general labour.

Camps will be required by the Contractor and will be located away from local residents. The camps will be separate and self-sufficient for workers who are not local residents. Local residents will be hired when possible and workers will be transported to and from residences. Replacement workers may be hired and work camps may be moved as construction progresses.

The construction camps for the converter stations will likely be closer to local communities. Care must be exercised to keep them separate and maintain positive relations with these communities. Providing business and employment opportunities can assist in this process. Camp sizes are estimated at 2.5 ha. Guidelines for camp construction and placement are presented in Annex 2 and 3 of the ESMP.



## **9. CONSTRUCTION PROCEDURE**

The Contractor will be required to prepare a detailed and comprehensive procedure to ensure all project/construction activities have minimal impacts on the physical, biological and social environments including safety. The execution and efficiency of these procedures are to be monitored by the appropriate environmental agencies and safety agencies in each of the four CASA 1000 nations.

The construction procedures will be the same for both the Northern 500 HVAC T/L and the Southern 500 HVDC T/L.

### **9.1 ACCESS TO CONSTRUCTION SITES**

The Contractor will require at least one storage yard in each nation for materials and for equipment deliveries. The storage yard locations will be decided by the Contractor with input from the Project Environmental Unit during the final design phase, but they will likely be located near the RoW and an existing road.

Equipment and materials will be transported from the storage yards to each tower site by trucks using existing roads/tracks when possible. If temporary roads are needed along the RoW, the locations will be identified during the final design phase. In some cases, access may require use of agricultural tractor/trailers or in extreme cases it may be necessary to transport materials short distances manually.

For the converter stations, some of the equipment may need to be stored in-doors and thus a separate building is usually erected for this purpose. This building can then act as a storage and maintenance building once construction is completed. Permanent road access is required. Heavy road access or rail access is also required for the heavy equipment. 24 hour a day security is likely required during the construction process.

### **9.2 CLEARING ROW**

Clearing will occur before construction activities begin. Vegetation will be removed if it is/has potential to reach a hazardous height. Vegetation within the centerline will be cut, not controlled with chemicals. Vegetation near the edge of the RoW will be trimmed rather than cut. A 3 m wide track along the RoW will be cleared manually on the edge of the RoW for residents to salvage. Public vehicle access or growing of crops will not be allowed in the RoW. The electrode line RoW should be similar.

### **9.3 TOWER FOUNDATIONS AND TOWER ERECTION**

Tower foundations will be constructed in reinforced concrete and the foundation will be “pad and chimney” foundations. The area of excavation will be approximately 2.5 m X 2.5 m X 2.5 m and will be filled with 15 to 20 m<sup>3</sup> of concrete. Excavated soil will be backfilled within 2 days of the concrete pouring.

To ensure foundation stability, tower construction will only begin 14 days after the foundations are completed. “Gin pole” is the expected to be the method used for tower erection. This method is labor intensive but does not require large cranes. The working area around each tower site will be approximately 20 m X 20 m.

#### **9.4 STRINGING OF CONDUCTORS AND OVERHEAD GROUND WIRE**

Stringing of conductors and overhead ground wires will be done with the “tension” method. By using this method, the conductors are never in contact with the ground and damage and abrasion is avoided. Care must be taken not to drag the conductors on the ground which then produces corona discharges and EMI.

## 10. OPERATION AND MAINTENANCE ARRANGEMENTS

The T/L and all towers will be inspected annually to determine the maintenance needs. Common repairs needed on transmission lines include: vegetation overgrowth, cracked/broken insulators, minor washouts of foundation backfill and missing tower members. A repair schedule will be prepared once the inspection is complete. Emergency repairs may be required throughout operation of the T/L due to accidents, violent storms, etc. They may require the placement of repair parts and towers in various locations along the T/L to allow for rapid repairs. Emergency preparedness plans should be prepared to mitigate this.

Maintenance of the T/L will require six to ten employees, one bucket truck, one or two 4 WD vehicles and miscellaneous line tools. Access roads must be controlled so they cannot be used by the public and maintenance roads must be located on the edge of the RoW as to not impact line to ground clearances.

The converter stations will likely have a permanent staff of 15 to 20 highly skilled and semi-skilled staff at each location. These staff will require permanent housing likely in a local community. Incentives to attract and maintain the highly skilled staff may be required. Reliability Centered Maintenance (RCM) should be employed to keep maintenance costs reasonable and maintain reliability. Root Cause Analysis should be employed to maintain a high reliability. Some of the equipment, such as bucket trucks, may also be used for T/L maintenance.

The electrode line and electrode are to be inspected on a regular basis (usually monthly) and before each pole maintenance outage. Advanced protection schemes may allow this level of inspection to be relaxed.



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## PART C: ESIA

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## HOW PART C: ENVIRONMENTAL & SOCIAL IMPACT ASSESSMENT (ESIA) IS ORGANIZED

**Section 1: ESIA INTRODUCTION**

Provides a general background of the ESIA process as well as methodology, sources of data and limitations.

**Section 2: ANALYSIS OF ALTERNATIVES**

Describes and provides an analysis of the alternatives to the CASA 1000 project.

**Section 3: WORLD BANK GUIDELINES**

Summarizes the World Bank Policies and Guidelines relevant to the ESIA process for all countries involved in CASA 1000.

**Section 4: ESIA-KYRGYZ REPUBLIC**

Environment and Social Assessment of CASA 1000 in the Kyrgyz Republic.

**Section 5: ESIA-TAJIKISTAN**

Environment and Social Assessment of CASA 1000 in the Tajikistan Republic.

**Section 6: ESIA-AFGHANISTAN**

Environment and Social Assessment of CASA 1000 in the Afghanistan Republic.

**Section 7: ESIA-PAKISTAN**

Environment and Social Assessment of CASA 1000 in the Pakistan Republic.

**Section 8: SUMMARY OF MAIN PROJECT IMPACTS**

Provides an assessment of what information is still needed in order for ESMPs to be implemented and prior to the construction phase of the CASA 1000 project.

**Section 9: GAP ANALYSIS**

Provides an assessment of what information is still needed in order for ESMPs to be implemented and prior to the construction phase of the CASA 1000 project.



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## 1. ESIA INTRODUCTION

### 1.1 PROJECT BACKGROUND

The Kyrgyz Republic, Tajikistan, Afghanistan and Pakistan are pursuing the development of electricity trading arrangements and the establishment of a Central Asia - South Asia Regional Electricity Market (CASAREM).

One of the key components of this initiative is the proposed development of a cross-border transmission interconnection linking the four countries to facilitate the transfer of surplus power that would be made available in the Kyrgyz Republic and Tajikistan, southwards to Pakistan and Afghanistan – the CASA 1000 Project.

The CASA 1000 Project consists of two components:

- 500 kV High Voltage Alternate Current (HVAC) interconnection between the Kyrgyz Republic and Tajikistan, located in the North Western part of the country; and
- 500 kV High Voltage Direct Current (HVDC) transmission line linking Tajikistan to Pakistan via Afghanistan, in the South Western part of Tajikistan.

The objective of these lines is to export about 1300 MW of surplus energy available from both the Kyrgyz Republic and Tajikistan to Pakistan and Afghanistan. It is envisaged that the major share of the export will be used by Pakistan, while a relatively smaller quantity of power (up to 300 MW) will be imported by Afghanistan.

The proposed Project has several benefits. The Project would:

- Assist some of the poorest countries in the world, some of which are coming out of, or involved in, prolonged conflict (Afghanistan and also Tajikistan);
- Enhance trade and regional cooperation in a region where it is greatly needed, strengthen economic growth, and demonstrate cooperation for similar teamwork in other sectors (e.g., transport); and
- Encourage private sector participation, if not in CASA 1000 initially, in other electrical generation projects that are being developed for export.

The 2011 feasibility update<sup>23</sup> confirms the reliability of the considerations that led to the CASAREM initiative to develop a regional market, i.e.

- Sufficient quantities of summer surplus electricity are available in the Central Asian countries the Kyrgyz Republic and Tajikistan;

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23 SNC-Lavalin of Canada (2011) - Central Asia - South Asia Electricity Transmission and Trade (Casa-1000) Project Feasibility Study Update.

- Significant need for electricity exists in South Asia, particularly in Pakistan; and
- Differences in the cost of electricity between importing and exporting countries potentially provide a justifiable rationale to make transmission investments in order to support the electricity trade.

## 1.2 ESIA SUMMARY OBJECTIVES

Specific objectives of the Environmental and Social Impact Assessment – Feasibility Stage are to:

- Produce one document summarizing, analyzing and assessing all environmental and social information available to date on the CASA 1000 project;
- Summarize existing social and environmental impact assessments and identify, where possible, additional data needs to be addressed during the implementation of the ESMPs and prior to the construction phase;
- Describe and provide analysis of environmental and social alignment sheets that document environmental and social concerns along the entire 1200 km RoW corridor of the CASA 1000 project; and
- Provide country-specific ESIA's for each of the four host countries identifying issues specific to those nations.

## 1.3 PREVIOUS ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT STUDY

The previous Environmental and Social Impact Assessment Study (ESIA) conducted by SNC Lavalin was at a conceptual “Strategic Level”<sup>24 25</sup>. The level of detail obtained was limited by lack of project details, quantity and quality of the project, effort and time, and security concerns in the area. More complete data will be produced by the Contractor, or their consultants, in conjunction with the construction planning and detailed T/L engineering design.

The level of detail obtained at the “Strategic Level” was used to identify significant constraints, estimate the cost of mitigation measures and meet lender safeguards.

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24 SNC Lavalin (2009f). Initial Social Impact Assessment (Tajikistan). CASA 1000 Transmission Line Project, Transmission and Distribution Division. SNC-Lavalin International Inc.

25 SNC Lavalin (2009g). Initial Environmental Impact Assessment (Tajikistan). CASA 1000 Transmission Line Project, Transmission and Distribution Division. SNC-Lavalin International Inc.

## 1.4 LIMITATIONS AND CONSTRAINTS OF THE ESIA – FEASIBILITY STAGE

SNC Lavalin produced an Initial Environmental and Social Assessment citing the following specific limitations<sup>26 27</sup> :

- The centerline and tower locations are unknown (to be selected in the final design phase);
- Secondary environmental and social information is very limited; and
- Physical, biological and social field surveys were limited.

The creation of an expanded environmental database on the physical and ecological environment needs to be considered for the implementation of the ESMPs and prior to construction.

## 1.5 METHODOLOGY

Project methods involved the following:

- Obtaining all previous project related information and reports from SNC Lavalin, Canada who completed initial engineering and environmental/social reviews of the CASA 1000 project;
- Summarizing all environmental and social information on project baseline, impacts, mitigation, management and monitoring measures into consistent summary documents for each of the four host countries;
- Obtaining and analysing all existing digital map and other geographic information on the project, including the purchase of 6 m Rapid EYE satellite data<sup>28</sup>; and
- Identifying information requirements to be addressed and fulfilled at the time of final route selection as part of the ESMP implementation.

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<sup>26</sup> Ibid

<sup>27</sup> Ibid

<sup>28</sup> <http://www.rapideye.de/>



## 2. ANALYSIS OF ALTERNATIVES

This section provides an overview of the different alternatives that have been examined. These alternatives are:

- The No Project option;
- Alternative Projects;
- Alternate Routes/Alignments;
- Design Alternatives.

### 2.1 NO PROJECT

The power generation capacity of Pakistan falls significantly short of its current and future needs. At present it is estimated that only half of Pakistan's 141 million people have access to electricity. Additional pressure is being put on already deficient electrical capacity by a growing population, increasing urbanization and expansive industrialization. Pakistan's current shortfall is estimated at 3,000 MW and the Government of Pakistan is actively looking for options to reduce this gap.

Although its shortfall is not of the same magnitude as Pakistan's, Afghanistan is also dealing with a shortfall of electricity. A growth of urban centers and increased industrialization as Afghanistan tries to integrate into the modern global economy has resulted in a need to increase the amount of electricity available in the nation.

The No Project alternative would require Pakistan and Afghanistan to either develop additional generation capacity within their own borders or import additional electricity from countries other than Tajikistan and the Kyrgyz Republic. Both Afghanistan and Pakistan are already in the process of maximizing local generation capacity, but in the absence of the CASA 1000 project their needs are unlikely to be filled. Importing from countries other than Kyrgyz Republic and Tajikistan is likely to come at a higher fiscal cost.

The No Project alternative would also require the Kyrgyz Republic and Tajikistan to find different markets to purchase their additional electricity or lose the value of that capacity. As stated in the project summary, Tajikistan and the Kyrgyz Republic are poor countries and the income potentially created by CASA 1000 is expected to have a significant positive impact on the nations and their people.

The CASA 1000 project and the CASAREM have the potential to strengthen regional cooperation. The No Project alternative would dampen the opportunity to foster this cooperation and the ancillary benefits it could create. This would be a net loss for the Central Asian region as a whole.

## **2.2 ALTERNATIVE PROJECTS**

### **2.2.1 NEW HYDRO POWER STATIONS**

A number of hydro stations are currently planned in the northern region of Pakistan that could be considered as alternatives to the CASA 1000 project.

Hydro Power station construction is time consuming and expensive. Extensive technical, geological, environmental, and social studies are required prior to making a decision on the feasibility and economic viability of new stations. It is unlikely that new hydro power capacity could be generated quickly enough to meet Pakistan's growing need for power and therefore this is not seen as a feasible alternative to the CASA-1000 project.

### **2.2.2 NEW THERMAL POWER STATIONS**

Different types of thermal power stations were considered as alternatives. Conventional thermal and combined cycle power plants require considerable amounts of fuel and water, and discharge warm water and pollutants to the environment. The cost to operate thermal power stations is high due to crude oil and gas prices and may not be as affordable as the transmission line.

## **2.3 ALTERNATIVE T/L ROUTES OR ALIGNMENTS**

When determining possible routes for the transmission line, the following criteria was considered:

- Total length;
- Difficult terrain and high altitudes;
- Routes near existing roads;
- Routes near load centers; and
- Environmental and social impacts

Two different corridors were considered for the T/L route selection, an eastern corridor and a western corridor. The western route was chosen due to its proximity to existing roads between Torkham and Jamrod and from Jamrod to the sub-station at Peshawar. The eastern corridor also had the disadvantage of not being close to any existing or planned load centres in Afghanistan, significantly reducing the potential benefits of the CASA 1000 project to that nation.

## **2.4 DESIGN ALTERNATIVES**

Constructing a 500 kV HVAC for the southern route from Tajikistan to Pakistan was considered as an alternative to the 500 kV HVDC transmission interconnection. Not only was the cost estimate of the HVAC transmission line significantly higher than the HVDC transmission line, it was also determined to

be unstable. HVDC lines generally have smaller “foot prints” because their RoW requirements are less, and they require smaller tower and line dimensions. For the reasons mentioned above, the 500 kV HVDC transmission interconnection was chosen.



### 3. WORLD BANK GUIDELINES AND REQUIREMENTS

It is a pre-requisite of the World Bank that Governments seeking financial assistance for development projects should carry out an EIA and prepare environmental management and resettlement plans (OP 4.01). It is also required that the environmental and resettlement planning meet the requirements of the Bank's operational directives and policies. The operational directives and policies that apply to the CASA 1000 project are described below. These same guidelines apply to each of the four countries in the CASAREM group.

#### 3.1 WB OP 4.01 – ENVIRONMENTAL ASSESSMENT

- Requires proponents to conduct Strategic Environmental and Social Assessment (updated 2011), and, prepare Social Management plans from initial data collection.
- Emphasizes the importance of a baseline assessment capturing context specific socio-cultural household and community data.
- Describes the procedures and guidelines for conducting assessments including aspects to be considered in public consultations and information disclosure.
- Provides environmental screening guidelines for classifying projects into various categories (A, B, C and FI).
- Contains three Annexes providing the definition of terms, guidelines for preparation of EA reports and procedures and policies for preparation of Management plans.

#### 3.2 WB OP 4.11 – CULTURAL PROPERTY

- Describes policies with regards to cultural properties, sites and structures that which have significant archaeological, historical, religious, cultural, or aesthetic value.

#### 3.3 WB OP 4.12 – INVOLUNTARY RESETTLEMENT

- Proponents will provide: (1) compensation to replace lost assets, livelihood, and income; (2) assistance for relocation, including provision of relocation sites with appropriate facilities and services; and (3) assistance for rehabilitation to achieve at least the same level of well being with the project as without it. Some or all of the elements may be present in a project involving IR.
- The guiding principles are:
  - Avoid resettlement whenever feasible, or, where resettlement is unavoidable, minimize its extent by exploring all viable alternatives.

- Where Land Acquisition and Resettlement is unavoidable, resettlement activities are carried out in a way that provides a sufficient opportunity for the people affected to participate in the planning and implementation of the operation.
- The construction documents must include provisions for minimizing temporary dislocation. These provisions should include precise scheduling of construction and the use of appropriate construction technology to reduce disruption.
- If incomes are adversely affected, adequate investment is required to give the persons displaced by the project the opportunity to at least restore their income.
- If a linear project will displace only a few people, turning to the market for replacement plots and houses will simplify the resettlement process and increase satisfaction of the affected families.
- Because the populations displaced along a linear corridor may be culturally heterogeneous, standardized resettlement solutions may not work. Case-by-case solutions may be required.
- If the affected population is dispersed, negotiation with each family or economic unit may be more effective than negotiating with community representatives.
- Communities should be consulted to determine the location of underpasses and overpasses for people, livestock, and vehicles.
- Whenever possible, people adversely affected are to be made project beneficiaries. For example, they should be provided with access to energy, in transmission line projects; with transportation, in rural road projects; with serviced plots, in irrigation projects; or with water and improved hygienic conditions, in water and sanitation projects.
- Permitting continued seasonal use of nonessential areas within the RoWs and in areas under transmission lines may be especially important for the poorest segments of society.
- Incorporation of project bays, parking spaces, and so forth within the main designs will greatly help in relocating street vendors and others in the informal economy, while ensuring safety for users of roads and railways.
- Establishing a cut-off date for eligibility as soon as project designs are ready is the most efficient way to prevent fraudulent claims for assistance.

### **3.4 WB OP 7.60 – PROJECTS IN DISPUTED AREAS**

- This policy deals specifically with areas that are under dispute. Operational guidelines of how the Bank should proceed in a disputed area are discussed.

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## 4. ESIA - KYRGYZ REPUBLIC

### 4.1 BACKGROUND TO THE KYRGYZ REPUBLIC ESIA

The following presents an environmental and social assessment of the CASA 1000 Project in the Kyrgyz Republic. The CASA 1000 design includes a 450 km 500 kV line from the Kyrgyz Republic south to Tajikistan. Of this total, 425 km of this line runs through the Kyrgyz Republic. Information has been sourced from previous environmental and social assessments completed by SNC Lavalin<sup>29 30</sup> and newly acquired 6 m satellite imagery.

It is important to note that there are major limitations in the information available for assessment in the Kyrgyz Republic ESIA. Unlike the other three CASAREM countries, no detailed field study was conducted along the proposed T/L route in the Kyrgyz Republic. The data collected was from only 25 sample points across the proposed 425 km RoW in the Kyrgyz Republic. Additionally, the baseline data collection does not include a review of Kyrgyz environmental legislation, a description of environmental and social baseline data, or an assessment of project impacts and related mitigation measures.

In order to address this deficiency, this ESIA uses secondary sources and a detailed analysis of the newly acquired high-resolution satellite data and accompanying environmental and social Alignment Sheets to create as complete an ESIA as possible. It should be noted that significant gaps still remain and are summarized in Section 9.

### 4.2 NATIONAL LAWS AND LEGISLATION

The information pertaining to the legal and regulatory framework in the Kyrgyz Republic was collected from secondary sources<sup>31</sup>. The State Agency for Environmental Protection and Forestry (SAEPF) is the key institution responsible for the establishment and implementation of environmental policy in the Kyrgyz Republic. The Department of the State Environmental Review under the SAEPF is responsible for reviewing environmental assessment documents for projects of national significance.

Other major stakeholders in environmental assessment are:

- Ministry of Health (safety and health issues);
- Ministry of Emergency Situations (natural hazards), and its subsidiary agency Kyrgyz Hydromet (KHM, or Hydromet, responsible for ambient air and water quality monitoring);
- Ministry of Agriculture (agricultural issues)

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<sup>29</sup> Ibid

<sup>30</sup> Ibid

<sup>31</sup> Ministry of Transport and Communications of the Kyrgyz Republic (CAREC Transport Corridor 1: EIA)

- Ministry of Natural Resources (mineral resources, road construction materials, and quarries);
- Local administrations (social issues, land use, etc)

Additionally, the Kyrgyz Republic has acceded to the Aarhus Convention on Public Participation and the Espoo Convention on Environmental Impact Assessment on projects with Transboundary Impacts.

With reference to the Resettlement Framework, a process of negotiation and signatories are underway towards an agreement between Tajikistan and the Kyrgyz Republic, stipulating that the Kyrgyz Republic would follow Tajikistan's National Policies and Administrative Frameworks regarding Land Acquisition and Resettlement. This has to be confirmed as part of any follow-up activity.

The following statutes are relevant to CASA 1000:

**Table C4-1: Kyrgyz Republic –Relevant Legislation**

Legislation	Year Passed (amended)	Purpose/Content
Constitution of Kyrgyz Republic	2010	Land, subsoil, air, waters, forest, wildlife and other natural realized and, at the same time, protection will be given.
Law on Environmental Protection	1999 (2002, 2003, 2004, 2005, 2009)	The general legal framework for comprehensive environmental protection and for the use of them, including environmental standards setting, legal regime of specially protected area, rules and procedures for their use.
Law on Specially Protected Area and Biosphere territory	1999	Establishes the legal requirement for the protection and use of all natural objects within certain areas.
Law on the Protection of Ambient Air	1999 (2003,2005)	Ambient air standard and air quality management.
Land Code	1999 (2000, 2001)	Regulates all issues concerning land plot properties.
Law on Waters	1994 (1995)	Regulates the use and protection of waters.
Forest Code	1999	Regulates the use and protection of forest resources.
Law on Ecological Expertise (State Environment Review)	1999 (2003, 2007)	About the use of public ecological expertise and environmental assessment procedures.
Law on Wildlife	2002 (2003)	About the protection of wildlife habitats
Law on Fisheries	1997	About regulation of commercial fishing and protection of bodies of water
Law on Subsoil	1997	About safe exploitation of subsoil and recovery of land for mining
Law on Protection and Use of Flora	2001 (2003, 2007)	About protection, use, and reproduction of flora
Law on Mountain Areas in Kyrgyz Republic	2002 (2003)	About sustainable development of mountain areas, conservation and management of natural resources, historical, cultural and architectural heritage
Law on Waste of Production and	2001	About waste management

Legislation	Year Passed (amended)	Purpose/Content
Consumption		
Law on the Rates for Pollution of the Environment	2002	Fixes the rate for pollution of the environment.

### 4.3 ENVIRONMENTAL AND SOCIAL SETTING

In October of 2008, a preliminary field survey was undertaken for the proposed transmission line route in the Kyrgyz Republic<sup>32 33</sup>. The initial survey was designed to only gather preliminary information on the route and was to be followed up by a detailed field survey. However, the detailed field survey was not completed due to the ADB's decision to withdraw from the CASA 1000 project. As a consequence, insufficient data was collected from this source to form an environmental and social baseline for the RoW in the Kyrgyz Republic. For this ESIA, the environmental alignment sheets are used as the basis for the Environmental and Social Setting. This is sufficient for an assessment of the CASA 1000 project's impact at the feasibility stage in the Kyrgyz Republic. However, as listed in the ESIA Gap Analysis, a detailed center line survey of the proposed RoW in the Kyrgyz Republic should be completed during implementation of the ESMPs and prior to the construction phase.

### 4.4 ENVIRONMENTAL AND SOCIAL ALIGNMENT SHEET DESCRIPTION

Environmental and Social Alignment Sheets and imagery provide critical information for the CASA 1000 transmission line route. ESASs store multiple layers of data in a single hard copy document. A series of ESASs were created for the entire CASA 1000 ROW, each approximately 11 km per sheet).

Using acquired 6 m satellite imagery and assisted by images from Google Earth, the ESASs were prepared by identifying project features, concerns and environmental sensitivity. The production of the alignment sheets was based on existing and new satellite imagery and photography.

The Alignment Sheets are a valuable tool for assessing the CASA-1000 project enabling the user to:

- Interpret the existing features and verify important features in surrounding area;
- Identify physical restrictions and general conditions expected along the route;
- Determine land use and vegetation cover;
- Determine general soils and slope information;

32 SNC Lavalin (2009f). Initial Social Impact Assessment (Tajikistan). CASA 1000 Transmission Line Project, Transmission and Distribution Division. SNC-Lavalin International Inc.

33 SNC Lavalin (2009g). Initial Environmental Impact Assessment (Tajikistan). CASA 1000 Transmission Line Project, Transmission and Distribution Division. SNC-Lavalin International Inc.

- Verify project intersections (roads, railways, and watercourses);
- Identify areas of environmental and socio-cultural importance; and
- Determine vegetation and wildlife habitat;

The entire 105 alignment sheets are found in Appendix 3 of this report.

#### **4.5 ALIGNMENT SHEET DESCRIPTION FOR THE 500 KVAC LINE IN THE KYRGYZ REPUBLIC**

The total length of the HVAC transmission line is 450 km, out of which 425 km passes through the Kyrgyz Republic and the remaining 25 km in Tajikistan. Alignment Sheets AS-003 to AS-043 as described below cover the 425km portion in the Kyrgyz Republic.

##### **AS-003**

The proposed T/L route traverses mountainous areas and intersects the Sry Darya River north of Ak-Tyube. There are no environmentally sensitive areas in this segment of the proposed T/L route.

The environmental impacts for this segment are anticipated as low as appropriate mitigation measures should be implemented during the construction phase.

##### **AS-004**

The proposed T/L route passes through the mountainous areas before crossing the Syr Darya River and agricultural communities. There are numerous small river crossings in this area. There is also a strong presence of agricultural lands and community infrastructure within the COI. The COI intersects access roads and a major rail network. Consider rerouting if compensation outweighs land value. Part D - ESMP and Part E – LARF describe mechanisms that should be followed to mitigate impacts.

The environmental impacts for this segment are anticipated as low as mitigation measures should be implemented during the construction phase. The proposed T/L route does not conflict with any known important bird migration routes.

##### **AS-005**

The proposed T/L route traverses through a mountainous area. The valley has a steep slope and the elevation ranges from 800m to 1650 m. A transmission line runs parallel to the proposed T/L route. There are no environmental sensitivity areas in this segment of the proposed T/L route.

The environmental impacts for this segment are anticipated as low as ESMP mitigation measures should be implemented during the construction phase.

**AS-006**

The proposed T/L route traverses the mountainous areas. Sparse vegetation is observed in this segment of the COI. There are no environmentally sensitivity areas in this segment of the proposed T/L route.

The environmental impacts for this segment are anticipated as low as ESMP mitigation measures should be implemented during the construction phase.

**AS-007**

The proposed T/L route traverses the mountainous areas and crosses the Syr Darya River near the community of Korgon. Korgon is a village situated in the Jala-Abad province of Kyrgyzstan. A rock quarry is located approximately 15 km NE of Korgon. The environmental sensitivity has been anticipated as medium as the COI includes watercourses, community infrastructure, roads and vegetated areas between Angle points K22 and K21 (KP 369+500). Part D - ESMP and Part E – LARF describe mechanisms that should be followed to mitigate impacts.

The environmental impacts for this segment are anticipated as low as ESMP mitigation measures should be implemented during the construction phase.

**AS-008**

The proposed T/L route passes through a sub-mountainous area and cultivated fields. There are small pockets of communities west of the Syr Darya River between Angle points KT21 and KT20. The environmental sensitivity has been anticipated as high due to steep side slopes and high elevation ranges (3,600 to 5000 masl). Numerous small river crossings are present in this area. Part D - ESMP and Part E – LARF describe mechanisms that should be followed to mitigate impacts.

The environmental impacts for this segment are anticipated as low as ESMP mitigation measures should be implemented during the construction phase.

**AS-009**

The town of Shadymyr is located 2 km north of the proposed T/L route. Shadymyr belongs to the Batken province in Kyrgyzstan. The route then passes through the cultivated lands and the town of Ravat. The land use type changes from undisturbed to cultivated between Angle points K20 and K19 (KP 356+800). There are no environmentally sensitivity areas in this segment of the proposed T/L route. Part D - ESMP and Part E – LARF describe mechanisms that should be followed to mitigate impacts.

The environmental impacts for this segment are anticipated as low as mitigation measures should be implemented during the construction phase. The proposed T/L route does not conflict with any known important bird migration routes.

### **AS-010**

The land use type is predominantly undisturbed, marked by mountains and rivers. The slope changes from level to moderate as the COI is dotted by mountainous areas, with numerous watercourses between Angle points KT19 (KP 346+300) and KT18 (329+300). A major river and a highway run parallel to the COI. The environmental sensitivity has been anticipated as low as there are no sensitive areas along this segment.

The environmental impacts for this segment are anticipated as low as ESMP mitigation measures should be implemented during the construction phase.

### **AS-011**

A very regular sequence of moderate and steep slopes, ranging in elevation from 1,675 to 2,100 masl between Angle points K19 and K18. A major river parallels the COI. The environmental sensitivity has been anticipated as medium as the proposed T/L route passes through the steep slopes.

The environmental impacts for this segment are anticipated as low as ESMP mitigation measures should be implemented during the construction phase.

### **AS-012**

The satellite imagery shows the presence of trees in the mountainous areas between Angle points KT18 (KP 329+300) and KT17 (KP 319+800). The proposed T/L route passes through the steep slopes separated by agricultural fields which are adjacent to the river valleys. Rice farming is the major occupation in the area. The T/L route crosses the Isfararinka River near the town of Charku (Isfara district, Sughd Province) in southern Tajikistan, situated on the border with Kyrgyzstan. There are no environmentally sensitivity areas in this segment of the proposed T/L route. Part D - ESMP and Part E – LARF describe mechanisms that should be followed to mitigate impacts.

The environmental impacts for this segment are anticipated as low as ESMP mitigation measures should be implemented during the construction phase.

### **AS-013**

The proposed T/L route passes through gentle to moderate slopes, ranging in elevation from 360 to 450 m. The vegetation is scattered along the COI between Angle points KT17 and KT16 (KP 305+100). There are no environmentally sensitive areas in this segment of the proposed T/L route.

The environmental impacts for this segment are anticipated as low as ESMP mitigation measures should be implemented during the construction phase.

**AS-014**

Scattered trees are present in this segment of the proposed T/L route. The proposed route intersects streams, river systems and vegetative areas between Angle points KT15 and KT16. There are no environmentally sensitivity areas in this segment of the proposed T/L route.

The environmental impacts for this segment are anticipated as low as ESMP mitigation measures should be implemented during the construction phase.

**AS-015**

In this segment of the proposed T/L line route, the land is owned by the government and the land use type is undisturbed. The town of Bulakbashi is located 1.5 km south of the COI. Bulakbashi is a town in the Batken province of Kyrgyzstan. The town of Subash is located 600m north of the COI near the Angle point KT15 (283+600). The satellite imagery shows the presence of scattered trees and watercourses. There are no environmentally sensitivity areas in this segment of the proposed T/L route. Part D - ESMP and Part E – LARF describe mechanisms that should be followed to mitigate impacts.

The environmental impacts for this segment are anticipated as low as mitigation measures should be implemented during the construction phase.

**AS-016**

The proposed T/L route traverses the steep terrain intersecting numerous watercourses. The land use type changes from undisturbed to cultivated as the land is shared by the government and local communities. The environmental sensitivity has been anticipated as medium as the T/L route traverses a steep terrain. Part D - ESMP and Part E – LARF describe mechanisms that should be followed to mitigate impacts.

The environmental impacts for this segment are anticipated as low as ESMP mitigation measures should be implemented during the construction phase. The proposed T/L route does not conflict with the important bird migration routes.

**AS-017**

The proposed T/L route traverses a combination of steep and moderate slopes intersecting numerous watercourses, agricultural lands and associated community infrastructure. The land use type includes undisturbed lands, roads, and cultivated areas. The town of Gaz is transected by the proposed T/L route. The environmental sensitivity has been rated as high as the COI passes through a major river system and cultivated lands and their associated community infrastructure. Construction of towers in this area could be a potential concern to the nearby communities. Part D - ESMP and Part E – LARF describe mechanisms that should be followed to mitigate impacts.

The environmental impacts for this segment are anticipated as low as ESMP mitigation measures should be implemented during the construction phase, including line reroutes as necessary.

**AS-018**

The proposed T/L intersects the Soh River between the mountainous areas near Angle point KT14 at KP 261+200. There are no environmentally sensitivity areas in this segment of the proposed T/L route.

The environmental impacts for this segment are anticipated as low as ESMP mitigation measures should be implemented during the construction phase. The proposed T/L route does not conflict with any known important bird migration routes.

**AS-019**

The proposed T/L route transects mountainous areas in this section. There are no environmentally sensitivity areas in this segment of the proposed T/L route.

The environmental impacts for this segment are anticipated as low as ESMP mitigation measures should be implemented during the construction phase.

**AS-020**

Khaidarkan is located 2 km north of the COI. The town resembles an urban type of settlement due to the presence of an airport and residential communities. The proposed T/L route transects mountainous areas and watercourses in this section. There are no environmentally sensitivity areas in this segment of the proposed T/L route. Part D - ESMP and Part E – LARF describe mechanisms that should be followed to mitigate impacts.

The environmental impacts for this segment are anticipated as low as ESMP mitigation measures should be implemented during the construction phase.

**AS-021**

The proposed T/L route transects mountainous areas and watercourses in this section. There are no environmentally sensitivity areas in this segment of the proposed T/L route.

The environmental impacts for this segment are anticipated as low as ESMP mitigation measures should be implemented during the construction phase.

**AS-022**

The proposed T/L route transects mountainous areas in this section. There are no environmentally sensitivity areas in this segment of the proposed T/L route.

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The environmental impacts for this segment are anticipated as low as ESMP mitigation measures should be implemented during the construction phase.

**AS-023**

The proposed T/L route transects mountainous areas and watercourses in this section. There are no environmentally sensitivity areas in this segment of the proposed T/L route.

The environmental impacts for this segment are anticipated as low as ESMP mitigation measures should be implemented during the construction phase.

**AS-024**

The proposed T/L route intersects the community of Kyzyl Bulak at Angle point K13 (KP205+700). Kyzyl Bulak is a village in the Nookat District of Osh province with a population of 2,932. The community is located adjacent to a major river system and the vegetation is scattered in this segment of the proposed T/L route. The environmental sensitivity has been anticipated as high where the proposed T/L transects the community. Part D - ESMP and Part E – LARF describe mechanisms that should be followed to mitigate impacts.

The environmental impacts for this segment are anticipated as low as ESMP mitigation measures should be implemented during the construction phase, including line reroutes where necessary.

**AS-025**

The proposed T/L route traverses adjacent to the communities between Angle points K13 and K12. The communities are located 0.5 km south of the COI. There are four major land uses. These include undisturbed, cultivated, road, and community infrastructure. There are no environmentally sensitivity areas in this segment of the proposed T/L route. Agricultural lands and associated community infrastructure present adjacent to the river systems. Part D - ESMP and Part E – LARF describe mechanisms that should be followed to mitigate impacts.

The environmental impacts for this segment are anticipated as low as mitigation measures should be implemented during the construction phase.

**AS-026**

The proposed T/L route passes through the mountainous areas adjacent to the agricultural fields. There are watercourse crossings and small pockets of community infrastructure along the COI. There are no environmentally sensitivity areas in this segment of the proposed T/L route. Part D - ESMP and Part E – LARF describe mechanisms that should be followed to mitigate impacts.

The environmental impacts for this segment are anticipated as low as ESMP mitigation measures should be implemented during the construction phase.

### **AS-027**

The environmental sensitivity ranges from medium to high and high to medium as the route passes through steep slopes and community infrastructure in the segment of the proposed T/L route. The land use type includes undisturbed lands, cultivated lands, road and associated community infrastructure. The town of Utch-Kurgan is located 8 km northwest of the COI. It is a large village picturesquely situated on the Isfairan River. With a population of over 11,000, it is the largest village in the Batken province of Kyrgyzstan. Isfairan River provides water to the nearby villages and water is used for irrigation purposes. Vegetation is scattered in this segment of the T/L route. The village of Chauvay is located 1.5 km southeast of the COI in a sub-mountainous environment. The village has a good network of access roads and one of the highways passes through the COI. Part D - ESMP and Part E – LARF describe mechanisms that should be followed to mitigate impacts.

The environmental impacts for this segment are anticipated as low as ESMP mitigation measures should be implemented during the construction phase.

### **AS-028**

The proposed T/L route intersects numerous watercourses before it crosses the village of Auliye near the Angle point KT12 (KP159+100). Auliye is located 1.3 km north of the COI. There are three major land uses. These include undisturbed, cultivated and community infrastructure. A major watercourse intersects the town of Aulye and the proposed route. There are no environmental sensitivity areas in this segment of the proposed T/L route. Part D - ESMP and Part E – LARF describe mechanisms that should be followed to mitigate impacts.

The environmental impacts for this segment are anticipated as low as ESMP mitigation measures should be implemented during the construction phase.

### **AS-029**

The proposed route intersects substantial areas of agricultural lands and associated community infrastructure in a sub-mountainous environment along Angle points KT12 and KT11. The COI passes through the village of Abshir Say and the Abshir Say River in the Osh province of Kyrgyzstan. Cultivated land is the major land use type as seen on the imagery. Also seen on the imagery is the presence of a rock quarry on the NW side of the proposed T/L line route closer to Angle point KT11 at KP 149+600. There are no environmental sensitivity areas in this segment of the proposed T/L route. Part D - ESMP and Part E – LARF describe mechanisms that should be followed to mitigate impacts.

The environmental impacts for this segment are anticipated as low as ESMP mitigation measures should be implemented during the construction phase.

**AS-030**

The proposed T/L route traverses the sub-mountainous environment before it crosses the South-Kyrgyz (Osh) highway near Bel, a village in the Nookat district of Kyrgyzstan. The environmental sensitivity has been rated as medium due to the presence of a graveyard near Angle point KT10 at KP 139+100. The community infrastructure is present on either side of the COI separated by South-Kyrgyz highway. Part D - ESMP and Part E – LARF describe mechanisms that should be followed to mitigate impacts.

The environmental impacts for this segment are anticipated as low as ESMP mitigation measures should be implemented during the construction phase.

**AS-031**

The proposed T/L runs parallel to the agricultural lands between Angle points K10 and K9. The environmental sensitivity has been anticipated as medium due to the presence of cultivated lands and associated community infrastructure in the vicinity of the COI. The city of Nookat is located 3 km southeast of the proposed T/L route. Nookat is one of the youngest cities of southwestern Kyrgyzstan. The city is well equipped with infrastructure services, business centers, public health and public institutions. Part D - ESMP and Part E – LARF describe mechanisms that should be followed to mitigate impacts.

The environmental impacts for this segment are anticipated as low as ESMP mitigation measures should be implemented during the construction phase.

**AS-032**

The proposed T/L route traverses the mountainous areas with steep and moderate slopes. The environmental sensitivity has been rated as medium due to the presence of communities and watercourses. The COI traverses a vast portion of agricultural fields and a major river system between Angle point KT9 and KT10. The satellite imagery shows the presence of scattered vegetation along the propose route in this area. The town of Uchbay is located 1.2 km south of the COI in the Osh province. The Osh road passes through the town of Uchbay and crosses the COI 3km east of Angle point KT9 at KP 118+400. The Osh road traverses the Naukat-Pass on the way to Osh. Part D - ESMP and Part E – LARF describe mechanisms that should be followed to mitigate impacts.

The environmental impacts for this segment are anticipated as low as ESMP mitigation measures should be implemented during the construction phase.

**AS-033**

The proposed T/L route then passes through the North of Dozdudairam Pass at an altitude of 1654 masl. The environmental sensitivity in this area has been anticipated as medium as the route passes through the steep slopes along the Dozdudairam Pass.

The environmental impacts for this segment are anticipated as low as ESMP mitigation measures should be implemented during the construction phase.

#### **AS-034**

The proposed T/L route passes through the Akbura valley which is approximately 5.5 km west of Angle point K8 at KP 94+800. Further southeast is a restricted zone and the Papan Reservoir which has been avoided and the line is routed north of the above mentioned restricted zone. The environmental sensitivity has been anticipated as medium due to the presence of the restricted zone southeast of the COI between Angle points KT9 and KT8. Osh is located 4 km northwest of the Akbura valley. Osh is the second largest city in Kyrgyzstan, often referred to as the “capital of the south”. Part D - ESMP and Part E – LARF describe mechanisms that should be followed to mitigate impacts.

The environmental impacts for this segment are anticipated as low as ESMP mitigation measures should be implemented during the construction phase.

#### **AS-035**

The proposed T/L route crosses several watercourses in a mountainous area. Undisturbed land is the main land use type along the COI. The satellite imagery shows the presence of vegetation along the proposed route. There are no environmental sensitivity areas in this segment of the proposed T/L route. If compensation mitigation measures are triggered Part E – LARF will provide guidance with regard to vulnerable populations and community investment strategies.

The environmental impacts for this segment are anticipated as low as ESMP mitigation measures should be implemented during the construction phase.

#### **AS-036**

The proposed T/L route traverses highway M41 and the Karatay River at an altitude of 1350 masl. The town of Karatay is located in the vicinity of the proposed T/L route. The environmental sensitivity has been anticipated as high in this area due to the presence of community infrastructure and the Karatay River. There are small communities located adjacent to the watercourse. Part D - ESMP and Part E – LARF describe mechanisms that should be followed to mitigate impacts.

The environmental impacts for this segment are anticipated as low as ESMP mitigation measures should be implemented during the construction phase.

#### **AS-037**

The proposed T/L route crosses the community of Kaynar which is located adjacent to the river valley. The environmental sensitivity has been anticipated as high as proposed T/L route traverses cultivated lands and associated community infrastructure in this area. Scattered vegetation is observed along the

proposed route. Part D - ESMP and Part E – LARF describe mechanisms that should be followed to mitigate impacts.

The environmental impacts for this segment are anticipated as low as ESMP mitigation measures should be implemented during the construction phase.

#### **AS-038**

The proposed T/L route crosses cultivated lands before entering the town of town of Leninskoye which is located within the COI. The town of Lensiskoye extends further down the valley. The environmental sensitivity has been anticipated as high for this region as the proposed T/L route traverses a large portion of cultivated lands and associated community infrastructure. Highway A370 parallels the route for approximately 5.6 km and intersects the proposed route at 2.5 km northeast of Angle point K7 at 51+700. Part D - ESMP and Part E – LARF describe mechanisms that should be followed to mitigate impacts.

The environmental impacts for this segment are anticipated as low as ESMP mitigation measures should be implemented during the construction phase.

#### **AS-039**

The proposed T/L route then enters the town of Uzgen which is on the northeast side of the COI. Uzgen is the capital of Uzgen district in the Osh province of Kyrgyzstan. Located between the major cities of Osh and Jalabad in the south of the Kyrgyz Republic, Uzgen is a medium sized city providing markets, services and agro processing industries for the surrounding agricultural areas. The environmental sensitivity has been rated as high as the proposed T/L route traverses the cultivated lands and associated community infrastructure. Installation of towers in these locations might pose some concerns in the area. Part D - ESMP and Part E – LARF describe mechanisms that should be followed to mitigate impacts.

The COI traverses the Kar –Darya River and a large area of agricultural lands. Community housing is located in the flood plains of the river between Angle point KT7 and KT6 (37+500). Several river crossings may be required to intersect the river.

The environmental impacts for this segment are anticipated as low as ESMP mitigation measures should be implemented during the construction phase.

#### **AS-040**

The proposed T/L route crosses the cultivated lands and the Kara-Darya River again. The impacts will be negligible as the route traverses moderate slopes and the sub-mountainous areas. There are no environmentally sensitivity areas in this segment of the proposed T/L route. Part D - ESMP and Part E – LARF describe mechanisms that should be followed to mitigate impacts.

The environmental impacts for this segment are anticipated as low as ESMP mitigation measures should be implemented during the construction phase.

#### **AS-041**

The segment between Angle point KT6 and KT5 (KP15+700) has a combination of undisturbed and cultivated lands and the proposed T/L route crosses numerous watercourses in the sub-mountainous environment. The environmental sensitivity between Angle points K5 and K4 is anticipated as high as the COI passes through the town of Jalal-abad. It is the administrative and economic center of Jalal-abad province in southwestern Kyrgyzstan, with a population of 150,000. Jalal-abad is situated at the north-eastern end of the Fergana valley along the Kugart river valley, in the foothills of the Babash Ata mountains, close to the Uzbekistan border. Agricultural land and community housing is located in the flood plains of Kugart River. A major rail road crossing is present east of Angle point KT4 (KP 15+300). Part D - ESMP and Part E – LARF describe mechanisms that should be followed to mitigate impacts.

The environmental impacts for this segment are anticipated as low as ESMP mitigation measures should be implemented during the construction phase.

#### **AS-042**

The proposed T/L route traverses the cultivated lands and associated community infrastructure in the flood plains of Kugart River valley. The environmental sensitivity has been anticipated as high since the proposed route intersects the Kugart River between Angle point KT3 (KP 11+100) and KT2 (KP 10+800). Part D - ESMP and Part E – LARF describe mechanisms that should be followed to mitigate impacts.

The environmental impacts for this segment are anticipated as low as ESMP mitigation measures should be implemented during the construction phase.

#### **AS-043**

The proposed T/L route terminates at the Datka substation at Angle point KT1 (KP 0+00). Datka Substation is situated in the Suzak district of Jalal-abad province in southwestern Kyrgyzstan. There are no environmentally sensitive areas in this segment of the proposed T/L route.

The environmental impacts for this segment are anticipated as low as ESMP mitigation measures should be implemented during the construction phase.

### **4.6 IMPACT ASSESSMENT**

The significance of the potential impacts from the construction and operation of the 500 KVAC interconnection line on the physical, biological, and social environment are identified and assessed in this section. The ESMP framework (provided in Part D) contains a set of plans to mitigate these impacts. With a robust ESMP in place, potential environmental and social impacts of the CASA-1000 project in the Kyrgyz Republic can be comprehensively mitigated.

## **4.6.1 ENVIRONMENTAL**

### **4.6.1.1 LAND**

Soil erosion during construction stage may occur in construction areas, as a result of improper runoff control and improper management of construction activities. Impacts are particularly serious in hilly areas and near streams. Land, surface water and ground water may be contaminated by spillage of chemicals, fuels, solvents, oils, paints and other construction materials such as concrete. These impacts are considered to be low, if properly managed by measures contained in Part D - ESMP.

### **4.6.1.2 WATER**

Local water supplies are required for the construction of the T/L and campsites. The communities already have acute water shortages and the potential for conflict between locals and the Contractor may be significant.

- Use of local water sources (wells/streams/groundwater) during construction to meet the campsite and construction requirements. Local communities are facing acute shortage of water to meet their domestic and agricultural needs. Conflicts over water use may result between the locals and contractors. While the conflict may be of limited duration it could be significant for local people;
- Siltation of Natural Streams and Irrigation Channels by excavated material carried from construction and storage areas by runoff;
- Specific impacts for the 500 KVAC interconnection line indicate that possible contamination of surface water can occur in parts of the COI segment in the Kyrgyz Republic. The COI intersects the Kar-Darya, Kugart and Isfairan rivers, all three of which are important sources of water to nearby communities. If the mitigation measures and good construction practices are followed during construction and operation, impacts will be insignificant.

### **4.6.1.3 NOISE AND AIR QUALITY**

- Ambient Air Quality: will be affected by dust and emissions from construction machinery, and vehicular traffic during the construction phase. Dust and emissions may be carried over long distances, depending on wind speed and direction, humidity and atmospheric stability. The major sources of air pollution during the construction phase are quarry areas that generate dust during the rock blasting and crushing and vehicles and machinery that would also emit particulates and gaseous pollutants. Trucks will also generate dust, particularly during loading and unloading processes.
- Noise and vibration impacts from the construction, operation, maintenance and decommissioning of the proposed transmission line: noise from construction activities would generally be emitted from equipment used for the construction of access tracks, clearing of vegetation, construction of supporting towers and associated facilities and rehabilitation. Noise

from operation and maintenance activities along the proposed transmission line would be from electrical conductors and equipment used for the maintenance of access tracks, and periodic inspection of the transmission line. While the route of the proposed transmission will be within a corridor that has a relatively low population density, noise generated by the construction machinery during construction will affect near-by residents to some extent.

- Predicted noise levels from construction of the proposed transmission line would be carried out in a number of stages as follows:
  - Profile and preconstruction survey to locate structures;
  - Construction of access tracks and clearing of vegetation;
  - Installation of foundations, erection of structures and stringing of conductors and Earth-wire; and
  - Easement restoration and rehabilitation.

Of the above, the noisiest activities will be during construction. Noise during the operation and maintenance of the high voltage transmission line mainly arises from maintenance activities. Audible noise during operation of the transmission line may result from minor electrical discharge caused by ionization of the air by high strength electric fields adjacent to conductor and hardware surfaces. This phenomenon is known as the “corona effect” and the levels of noise generated vary depending on the conductor surface and atmospheric conditions. Noise levels from the corona effect are generally not noticeable under normal weather conditions.

#### **4.6.1.4 FLORA**

- Agriculture: Construction activities can damage crops such as cotton and fruit orchards. Construction activities will also hinder farming activities and affect cropping intensity. However given that less than 10% of the COI in the Kyrgyz Republic is under agriculture, these impacts are considered low and can be addressed by implementation of the LARF, Part E;
- Trees: Because of the relatively small number of trees in the COI and due to the fact that trees will only have to be cut if they are within 25 m of the centerline, it is unlikely that many trees will be affected during the construction of the T/L in the Kyrgyz Republic. The exact number of trees that will be cut can only be determined once the location of the centerline and the towers has been fixed during the final design phase of project development; and
- Shrubs / other vegetation: the overall impact of the T/L on shrubs and other vegetation will not be significant because of the lack of shrubby vegetation and ephemeral nature of the perennial grasses. The degree of impact to the affected vegetation and vegetation cover can only be determined when the towers are fixed during the detailed design phase of project development. In any event, it will be possible to route the line and place towers to avoid vegetation damage. Impacts of vegetation are expected to be minimal.

#### 4.6.1.5 FAUNA

- Mammals and Reptiles: There are no significant habitats or species of rare, endangered or protected, wildlife in the COI and the overall impact on mammals and reptiles will not be significant.
- Birds / Avian Fauna: As most of the COI is not rich in birdlife due to lack of suitable habitat and no important bird areas, the impact on birds will not be significant.
- Fish and Aquatic Ecology: Some of rivers contain fresh water fish. In general, these species are neither protected nor of high value from ecological, economic or social point of view. The CASA Project should not affect fish or impact aquatic ecology if provisions of the ESMP are implemented.

#### 4.6.2 SOCIO-ECONOMIC AND CULTURAL ENVIRONMENT

Impacts of the CASA 1000 Project on people and communities within the COI in the Kyrgyz Republic are expected to be minimal and effectively mitigated by proper implementation of the ESMP and LARF. The following general impacts and mitigation measures may occur.

##### DESIGN STAGE:

- The alignment of the transmission line can easily be selected in such a way that settlements in the vicinity of the proposed COI within the Kyrgyz Republic will not be affected;
- Privacy is an important matter for project affected people and the activities and customs of local people must be taken into account when selecting the final route alignment;
- The project can easily be routed so as to affect the minimum number of trees, which are relatively important to livelihoods in the area;
- The transmission line can easily be routed to avoid schools and settlements; and
- Avoid shifting and maximize the distance of the T/L from existing permanent structures.

##### PRE-CONSTRUCTION STAGE:

- Compensation will be made prior to occupation of the land by the Construction Contractor;
- In the event structures need to be moved or demolished, compensation will be negotiated and provided prior to project implementation; and
- The same protocols will apply to crops and productive land.

##### CONSTRUCTION STAGE:

- To avoid conflicts/disputes with local people, the project staff and contractors and their activities will be confined within clearly demarcated construction areas;

- The Contractor will dispose of materials only within designated areas;
- A worker code of conduct will be established and enforced;
- The Project will not affect the mobility of local people;
- Noise and dust emissions during the project execution will be controlled;
- The Contractor will respect and follow local norms and traditions; and
- The Contractor will respect local women; and their privacy.

#### **4.6.2.1 LAND ACQUISITION**

Permanent land acquisition will not be necessary for this project, as the land surrounding the T/L towers may continue to be used for agriculture purposes. An area of 2500 m<sup>2</sup> will be required for a Contractor construction camp. Land may need to be acquired to relocate homes, but the exact number of homes that will be impacted cannot be determined, until the center line of the T/L is finalized.

Temporary acquisition of a land will be required for:

- Contractors' camps and facilities, i.e. storage, workshop, equipment parking and washing areas;
- Access roads for haulage, etc. utilizing land temporarily may affect its future productivity; and
- Land for construction campsites will be temporarily acquired. The impact of temporary land acquisition is not expected to be significant with implementation of the proposed ESMP and LARF mitigation measures.

#### **4.6.2.2 PUBLIC INFRASTRUCTURE**

The construction stage of the proposed project may affect existing infrastructure within the eventual T/L RoW. The potential impacts on existing infrastructure are as follows:

- Road Crossings: during line stringing there may be some short term local interference with traffic movement. However, if good construction and traffic control procedures are followed, there will be no significant impact on existing roads or traffic during the construction phase of the project; and
- Power Lines: the COI does not include the crossing of an existing T/L. Good construction practices and the mitigation measures outlined below will virtually eliminate the potential for any significant impact during construction. There will be no significant impact on existing power lines during the operation stage of the project.

While some public infrastructure, such as electricity poles, may have to be moved during the construction of the T/L, this will be an unusual and infrequent event. The final identification of what infrastructure will require to be moved can only be determined once the location of the centerline and the towers has been fixed during the final design phase employment

Local residents will have the opportunity to work for the Contractor and local goods and services will be used when possible, therefore the effects on employment are expected to be positive.

#### **4.6.2.3 CROP AND TREE LOSS**

Damage may occur to crops during the construction stage of the project due to the construction of tower footings and stringing of conductors. However, magnitude of losses will depend on the location of the centre line and the towers and the season during which the work is done. Compensation for crop and tree loss will be in accordance with the LARF/RAP found in Part E of this document.

#### **4.6.2.4 HEALTH AND SAFETY**

Construction workers may be exposed to minor nuisances from waste to serious health concerns. If mitigation measures and measures to ensure safety during construction are followed, significant impacts will not occur. Detailed safety mitigation measures are presented in Annex 8 of the ESMP.

#### **4.6.2.5 PROJECT AFFECTED PERSONS**

Population density in the COI is low; therefore the degree of contact between the work force and locals will be low. The COI has no indigenous people living in it and all local residence will be avoided during alignment and location of the towers. Contact between the local communities and the work force should be relatively easily managed. The extent of contact and the precise significance of the potential impacts on local communities and the work force during the construction period can only be determined once the location of the centre line and the towers, construction methods and work force are finalized.

Provisions for camps and minimizing community disturbance are presented in Annexes 1-3 of the ESMP.



## 5. ESIA – TAJIKISTAN

### 5.1 BACKGROUND TO THE TAJIKISTAN ESIA

The following presents an environmental and social assessment of the CASA 1000 Project in Tajikistan. It considers two project components: a) a 25 km 500 kV line to the north from the Kyrgyz Republic and b) a 117 km line in the south to Afghanistan. Information has been sourced from previous environmental and social assessments completed by SNC Lavalin<sup>34</sup> and newly acquired 6 m satellite imagery.

### 5.2 NATIONAL LAWS AND LEGISLATION

The Ministry of Environmental Protection and the Ministry of Natural Conservation are the key institutions responsible for the establishment and implementation of environmental policy in Tajikistan.

Other major stakeholders in environmental assessment are:

- Ministry of Health (safety and health issues);
- Ministry of Emergency and Civil Defense (natural hazards),
- Ministry of Agriculture (agricultural issues)
- Local administrations (social issues, land use, etc.)

In Tajikistan, Environmental Impact Assessment is subject to the “Law on Nature Protection” and the “Law on Ecological Expertise”. An Environmental Impact Assessment is a component of the State Ecological Expertise. This was set out in the 2002 amendments to the Environmental Protection law and in the 2003 Law on Ecological Expertise. Environmental assessment review is the responsibility of the Committee for Environmental Protection of the Ministry of Environmental Protection. According to the Law on Ecological Expertise, all civil works should be assessed for their environmental impacts and proposed mitigation measures are to be reviewed and monitored by the CEP.

The following statutes are relevant to this Project in Tajikistan<sup>35</sup>:

**Table C5-2: Tajikistan –Relevant Legislation**

Legislation	Year Passed (amended)	Purpose/Content
Water Code	2000	Ensures rational use of water as well as protection from pollution, damage and over-use.

<sup>34</sup> Ibid

<sup>35</sup> Ibid

Legislation	Year Passed (amended)	Purpose/Content
Land Code	1992	Directed at the rational use and protection of land and soil.
Law on Environmental Protection	1993	Proclaims the right of citizens to live in a favorable environment and be protected from negative environmental impacts.
Law on Ecological Expertise	2003	Sets out requirements for an EIA for projects in Tajikistan as well as the process for their review.
Forestry Code	1998	Directed at creating conditions for rational use of forests, their safe keeping and protection.
Criminal Code	1998	Defends the rights of persons, property and the environment from criminal action.
State Environmental Program 1998-2008	1997	Requires government officials to ensure sustainable development of the country during the post Soviet period of economic transition.
Program of Environmental Education and Training 2000-2010	1996	Recognizes the importance of professional training and education of the public on issues of environmental conservation and rational use.
Law on Migration	1996	Stipulates that the resettlement of people must be managed by the Government of Tajikistan.
Aarhus Convention on Public Participation	2001	Requires public participation in decision-making on environmental matters.
National Development and Poverty Reduction Strategy	2009	Includes sections on environmental sustainability.
Rio Declaration	1992	Contains 27 principles intended to guide sustainable development around the world.
Ramsar Convention on Wetlands	2000	International treaty for the conservation and sustainable utilization of wetlands.
Convention on Biological Diversity	1997	International treaty with the objective of developing national strategies for the conservation and sustainable use of biological diversity.
UN Framework on Climate Change	1998	International treaty with the Objective to stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.
Bonn Convention	2001	Convention on the conservation of migratory species of wild animals.

### 5.3 ENVIRONMENTAL AND SOCIAL SETTING

The following is a general description of the natural and human environments along the CASA 1000 RoW in Tajikistan. It is divided into two sections a) 500 kV AC line and b) 500 kV DC line. Additional information is also provided in the description of the environmental and social alignment sheets that follow.

### 5.3.1 ENVIRONMENTAL AND SOCIAL SETTING FOR THE 500 KVAC LINE

The baseline environmental and social information for the 500 KVAC line was collected in the field during October and December 2008. Existing information pertaining to meteorology, geology, physiographic, land use, flora and fauna was obtained from consultations with government agencies and non-governmental organizations. Maps by the Geological Survey of Tajikistan have also been used to provide information on the project area.

Additionally, this information has been supplemented by the acquisition and review of high-resolution satellite data referred to in this document as Alignment Sheets. A description of the methodology for production of individual alignment sheets is provided in Part G.

#### 5.3.1.1 PHYSICAL ENVIRONMENT

The 25 km segment of the proposed transmission line (T/L) corridor is located in the Spitamen district of Tajikistan. In general, the topography of the area through which the T/L runs is either flat or hilly with low slopes. The T/L mostly passes through agricultural areas for the first 10 km. From there the T/L traverses an area of flatter topography until the end near the Isfana check post at the border of the Kyrgyz Republic.

#### CLIMATE:

Climate in the Tajikistan COI is variable with moderately cold winters and hot summers. The summer months are very hot and temperatures can reach more than +45°C. The average July temperature exceeds +30°C. The winter months are relatively cold and average January temperatures are about -3°C, but temperatures may drop to -28°C. Most of the COI in Northeast Tajikistan is in an area having a dry climate. Precipitation (rain or wet snow) from November to March is about 100-200 mm, but can reach more than 400 mm in hilly areas.

#### SOIL:

Profiles encountered in the study area are typically sierozem (grey desert soil) and light sierozem, (loamy sands), interspersed with conglomerates and loess with gypsum and gravel. The soil quality is poor and usually not suitable for agriculture. The soils in the area of the COI support mostly winter pastures. The COI between KP7.5 and KP10 and from KP17 to KP22 passes through agricultural areas, where soils are more fertile and better for agriculture.

#### GEOLOGY:

From KP0 to KP7 the COI is underlain with sandstone, conglomeration, marl and clay deposits. From KP7 to KP10 there is an area of Alluvium deposits with loam, clay sand, and sand founded by pebbles. From KP10 to KP17 there is the area of broken stone, loam, sand and clay. From KP17 to KP25 the bed rock is predominately represented by sandstone, conglomerate, marl, clay and rock.

**LAND USE:**

Land in the COI is state property. More than 70% of the corridor is unproductive and used only as seasonal pasture. There are a small number of agricultural lands (orchard and cotton fields) which will be directly under CASA 1000 T/L.

**AGRICULTURE:**

There are few agricultural lands in the COI of the proposed HVAC transmission line in Tajikistan. These lands comprise about 15% of the corridor. The main crops grown are cotton, grains, vegetables, fruits and mulberry. The latter are especially important.

**WATER:**

There are two rivers which run through the COI in Tajikistan. The T/L crosses the Aksuu River in the vicinity of the COI at KP7.7. When water is available, it is important for livestock and domestic use. There are no water storage facilities in the COI. The second watercourse is the Karasu River which runs in the vicinity of the COI from KP20 to KP21. There is also a channel that runs through Kurkat and crosses the COI. There is no other regular surface water flowing within the COI. Ground water can be found at depths from 5 to 10 m in vicinity of the COI.

**AIR AND NOISE QUALITY:**

As most of the COI is undeveloped, noise levels are low and the ambient air quality is good.

**5.3.1.2 BIOLOGICAL ENVIRONMENT**

The COI in Tajikistan is very dry and poorly vegetated with low biological diversity due to shortage of water, limited rainfall, and poor soil. Very few trees are present in the COI. The wildlife in the vicinity of the COI consists only of regionally common birds and small animals. There are no rare, endangered or protected species of vegetation or wildlife within the T/L corridor.

**FLORA:**

The vegetation distribution within the corridor itself is characterized as a desert ecosystem. Vegetation consists of bushes, shrubs and perennial plants such as bluegrasses (meadow grass), sedges and other phemeral grasses (*Artemisia sogdiana*, *A.korshinskyi*, *Poa bulbosa* L., *Carex pachystylis*, *Stipa caucasica*, *Bromus oxyodon*). There are no reserves or protected forests within the COI.

**FAUNA:**

Generally wildlife and fauna species, individual animals and overall biodiversity in the area is low.

- Mammals: Jackals (Asiatic jackal), Eared Hedgehog (*Paraechinus hypomelas*), Porcupine (*Hystrix indica*), Tolai Hare (*Lepus nigricollis*), Steppe Cat, and Gazelle are rarely encountered mammals

in the COI. There are no critical habitats for these species within or in the vicinity of the COI. The most common wild mammals in the COI include: Turkestan rat (*Rattus turkestanika*), Porcupine (*Hystrix indica*), colonies of Jerboas (*Allactaga elater*) and Mice; *Microtus afganus*, *Eilobius talpinus*, and *Meriones erythrourus*.

- Resident bird species: long-legged buzzard, lesser kestrel, stone curlew, black-bellied sandgrouse, crow, crested lark, little owl and striated scopiform. Among the birds, long-legged buzzard, lesser kestrel, houbara bustard, black-hazelgrouse, crow, crested lark, little owl and striated scopiform, golden eagle and others (*Aquila chrysaetus*, *Coracias garrulous*) are frequently seen.
- Migratory birds: there are a number of migratory birds which can be observed in the vicinity of the COI. These include black stork, (*Ciconia nigra*) white stork (*Ciconia ciconia*), black swift – *Apus apus*, shrike – *Lanius schach*, swallow – *Hirundo daurica*, *Hirundo rustica*, rosecolored starling – *Pastor roseus*, Egyptian Vulture – *Neophron pernopterus*, saker falcon – *Falco cherrug*. No important, rare, endangered, or protected bird species or habitats exist except for the black stork (*Ciconia nigra*), white stork (*Ciconia ciconia*), Egyptian Vulture (*Pastor roseus*) and saker falcon - *Falco cherrug*, are found within the COI.
- Aquatic life: other than the Aksuu and Karasu rivers there are no perennial water bodies within or near the COI. These rivers support *populations* of freshwater fish including: carp (*Cyprinus carpio*), marinka (*Schizothorax*) and pike (*Esocidae*). No important, rare, endangered, or protected fish species or critical fish habitats are found within the COI.

### 5.3.1.3 SOCIO-CULTURAL ENVIRONMENT

During the months of October and December 2008, a detailed social field survey was conducted within the 25 km x 2 km wide COI between Khoudjand substation (Ganchi district, Sugd region) and the Tajikistan-Kyrgyzstan border.

The socio-economic baseline noted that seven villages/towns/settlements are located in the vicinity of the COI. Only two are relatively close and can be avoided during the final route selection and tower placement.

#### DEMOGRAPHIC PROFILE OF PROJECT AREA:

- Adults of both sexes have almost 100% literacy as a legacy of the Soviet period;
- Major economic activities are farming, and small trading especially where microfinance programs are available; and
- The major sources of drinking water in the COI are the rivers Aksuu and Karasu, and irrigation channels. Consequently, most villages lack safe drinking water.

## **ECONOMIC PROFILE:**

Agriculture is the main economic activity in the region. The main products are cotton, cereals, oilseed, potatoes, carrots, onions, cucumbers, cabbage, melons, vines, milk, wool, honey and eggs. Cotton is a profitable cash crop but it is also controversial as it involves high inputs of water and chemicals and local farmers receive little profit.. The rolling hills support flocks of sheep, goats and cattle.

## **PUBLIC CONSULTATIONS:**

The following stakeholders were identified:

- Project Affected Persons (PAPs);
- Local/general population;
- Local administration – political agent, assistant political agent;
- Agriculture Department;
- Environmental Protection Agency;
- Jamoats;
- Irrigation departments;
- Power Department (Barki Tajik); and
- Local NGOs.

A number of meetings were held with government and NGO stakeholders during the social field surveys. These included representatives of the National and Regional Governments, agricultural enterprises, local environmental committees, and regional statistics departments.

### **5.3.2 ENVIRONMENTAL AND SOCIAL SETTING FOR THE 500 KVDC LINE**

Baseline information for the 500 KVDC line was collected in the field during November 2007 and March 2008. This information was supplemented with 6 m high-resolution satellite data.

A description of the methodology for production of individual alignment sheets is provided in Part G.

#### **5.3.2.1 PHYSICAL ENVIRONMENT**

##### **CLIMATE**

Moderately cold winters and hot summers are typical in the area. Precipitation can reach 400 mm in hilly areas. Snow may occur but does not accumulate. Summer temperatures can reach 45°C and winter temperature can fall to -20°C.

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## SOILS

Soils are typically loamy sands and loess. The humus layer is generally insignificant and the soil quality of the COI is very poor and unproductive, suitable only for grazing. The soils in the COI mainly support mostly winter pastures. These soils would require extensive irrigation and mineral fertilizers to be useful for agriculture. In the COI near the Afghanistan border some agriculture is practiced, as soils are more fertile.

## GEOLOGY

The COI is underlain by various types of bedrock and soils are typically loamy sands and loess. The topography is hilly with moderate slopes. The soil is mostly used for grazing and has very poor and unproductive soil quality. The T/L is located in one of the less-seismically active areas of Tajikistan. The geology of the area is suitable for transmission line construction.

## LAND USE

In Tajikistan, all land is state-owned, included lands within the COI are state property. More than 80% of the corridor is unproductive. Lands are only used seasonally for grazing livestock.

Tajikistan's Land Code addresses potential compensation for people who legally occupy government land and are forced to relocate, but the Land Code does not address compensation for people illegally occupying government land. The issue of compensation for illegal occupants of government land is covered comprehensively in the Land Acquisition and Resettlement Framework in Part E of this report.

## AGRICULTURE

The small number of agricultural lands that do exist in the COI produce good yields of cotton, grains, vegetables, fodder, fruits, and mulberry for silkworm breeding.

## WATER

The Vakhsh River is the only major water course that runs through the 500 KVDC line COI in Tajikistan. Numerous seasonal streams occur during the snowmelt and heavy rains. Groundwater tables are located at a depth between 0 to 5 m and below 15 m.

## AIR QUALITY

Ambient air quality is generally good and pollution free.

### 5.3.2.2 BIOLOGICAL ENVIRONMENT

Biodiversity is generally low because of water shortage, minimal rainfall and poor soil. The ecosystem type in the COI is desert-ephemeral, characterized mostly by dwarf shrubs and very few trees. Mulberry, plane tree and poplar are the most important tree species in the COI.

## **FLORA:**

The corridor itself is characterized as a desert ecosystem. Vegetation consists of bushes, shrubs and grass including bluegrasses (meadow grass), sedges and other ephemeral grasses (*Poa bulbosa* L., *Carex*, *Astragalus*, *Vulpia*, *Trisetum cavanillesii* Trin, *Leptaleum filifolium* (Willd.) DC). Two floral species categorized as rare are found in the COI, *Tulipa maximowiczii* and *Tulipa tubergenian*.

There are no forest reserves or protected forests within the COI.

## **FAUNA:**

Economically or socially important wildlife and mammals are nearly absent due to degraded vegetation in ecological habitats. Wildlife consists of small animals and regionally common birds. Common mammals in the COI include: Turkestan rat, porcupine, jerboas, mice, *Microtis afganus*, *Eilobius talpinus* and *Meriones erthrourus*. Foxes, jackals, eared hedgehogs, tolai hare, steppe cats and gazelle may also be found in the COI, but rarely. Birds recorded in the COI include the Egyptian vulture, long-legged buzzard, lesser kestrel, stone curlew, black bellied sandgrouse, crow, crested lark, little owl and golden eagles. Migratory birds in the area include: Kite, black swift, shrike, swallow, *Hirundo rustica*, rose-colored starling, neophron and Barbary falcon.

Reptiles such as the steppe tortoise, long-legged skink, tajik desert lacerta, steppe agama, cross-striated racer, frogs and green toads are commonly found within the COI. The Vakhsh River supports freshwater fish such as catfish and trout.

Within the COI, there are no rare, endangered or protected species of wildlife, fish or habitats of these species. The Egyptian Vulture - Neophron Percnopterus is listed as endangered. There are no wildlife sanctuaries, protected areas, or significant wetlands.

### **5.3.2.3 SOCIO-ECONOMIC ENVIRONMENT**

The COI covers 5 districts (rayons) of Khatlon Region (oblast) in Southern Tajikistan.

There are 12 villages/settlements in the vicinity but, only two are within the COI. Other than proximity to roads, houses or villages, no social, economic or cultural constraints were identified in these rayons. The population of the Khatlon region is about 2,500,000 (January, 2008), with an average population density of 99.3 people per km<sup>2</sup>. As previously mentioned, all land within Tajikistan is state-owned.

Household size ranges from 1 to 3 families, with average family size being 6.2 people. Males comprise 47.5 percent of the population and females comprise 52.5 percent. In rural populations, literacy rate is 90 percent and young females are 75-80 percent literate. Women are involved in various agricultural and household jobs and often have to fetch water from afar. Only 30 to 46 percent of the population in the COI report having easy access to potable water. Load shedding occurs for 2 to 4 hours daily.

There are no indigenous people or historical, cultural or archaeological heritage objects identified in the COI. As well, there are no public infrastructure/utilities located within the COI.

The main economic activity is agriculture; however, irrigation infrastructure downfall has led to damage to canals and loss of cultivated land. The Tajik government has taken steps to modernize and develop agricultural activities with the help of international financial organizations and foreign countries.

#### **5.4 ENVIRONMENTAL AND SOCIAL ALIGNMENT SHEET DESCRIPTION**

Environmental and Social Alignment Sheets and imagery provide critical information for the CASA 1000 transmission line route. ESASs store multiple layers of data in a single hard copy document. A series of ESASs were created for the entire CASA 1000 ROW, each approximately 11 km per sheet).

Using acquired 6 m satellite imagery and assisted by images from Google Earth, the ESASs were prepared by identifying project features, concerns and environmental sensitivity. The production of the alignment sheets was based on existing and new satellite imagery and photography.

The Alignment Sheets are a valuable tool for assessing the CASA-1000 project enabling the user to:

- Interpret the existing features and verify important features in surrounding area;
- Identify physical restrictions and general conditions expected along the route;
- Determine land use and vegetation cover;
- Determine general soils and slope information;
- Verify project intersections (roads, railways, and watercourses);
- Identify areas of environmental and socio-cultural importance; and
- Determine vegetation and wildlife habitat;

The entire 105 alignment sheets are found in Part G of this report.

##### **5.4.1 ALIGNMENT SHEET DESCRIPTION FOR THE 500 KVAC LINE**

The total length of the HVAC transmission line is 450 km, out of which 425 km passes through the Kyrgyz Republic and the remaining 25 km in Tajikistan. Alignment Sheets AS-001 to AS-003 as described below cover the 25km portion in Tajikistan.

##### **AS-001**

The proposed transmission line begins at the Khoudjand Substation (500 kV, KT 22) which is southwest of Proletarsk, the administrative capital of Rasulov district in Sughd Province, located south of the provincial capital of Khujand and south-west of the cities of Chkalovsk and Ghafurov. The proposed

transmission line route crosses the Syr Darya River (approximately 1 km from the substation) and passes through the mountainous areas and agricultural fields. There are no environmentally sensitive areas in this segment of the proposed T/L route. Part D - ESMP and Part E – LARF describe mechanisms that should be followed to mitigate impacts.

The environmental impacts for this segment have been anticipated as low as mitigation measures should be implemented during the construction phase.

The proposed T/L route does not conflict any known important bird migration routes or areas of important biodiversity.

#### **AS-002**

The proposed T/L route crosses the Syr Darya River, which runs parallel to and agricultural fields and associated community infrastructure. The environmental sensitivity has been anticipated as medium as the COI includes community infrastructure and a major river system. There are no environmentally sensitive areas in this segment of the proposed T/L route. Part D - ESMP and Part E – LARF describe mechanisms that should be followed to mitigate impacts.

The environmental impacts for this segment have been anticipated as low as appropriate mitigation measures should be implemented during the construction phase.

The proposed T/L route does not conflict any known important bird migration routes or areas of important biodiversity.

#### **AS-003**

The proposed T/L route traverses mountainous areas and intersects the Sry Darya River north of Ak-Tyube, located in Sughd province. There are no environmentally sensitive areas in this segment of the proposed T/L route.

The environmental impacts for this segment have been anticipated as low as appropriate mitigation measures should be implemented during the construction phase.

The proposed T/L route does not conflict any known important bird migration routes or areas of important biodiversity.

### **5.4.2 ALIGNMENT SHEET DESCRIPTION FOR THE 500 KVDC LINE**

The total length of the HVDC transmission line in Tajikistan is 117 km and is covered by alignment Sheets AS-44 to AS-53.

**AS-44**

The proposed T/L route begins at the Sangtuda Hydroelectric Power Plant (T15) at KP 0+00, located on the Vakhsh River in Tajikistan. The route traverses east of angle point T15 and T14 (KP 1+00) and turns south at angle point T13 (2+500). There are five major land use types in the region. These include road, pasture, cultivated lands, undisturbed lands and community infrastructure. The proposed T/L route crosses a major railway between angle points T13 and T14. There are several watercourses between angle points K13 and K12 (KP 5+300). Part D - ESMP and Part E – LARF describe mechanisms that should be followed to mitigate impacts.

The environmental impacts for this segment have been anticipated as low as mitigation measures should be implemented during the construction phase. The proposed T/L route does not conflict any known important bird migration routes or areas of important biodiversity.

**AS-45**

The T/L route passes through the sub-mountainous environment traversing winter pasture and seasonal streams between angle points K12 and K11 (KP 11+200). The satellite imagery shows the presence of scattered vegetation along the proposed T/L route. There are small pockets of houses present along the COI between angle points T11 and T10 (KP 21+000). Part D - ESMP and Part E – LARF describe mechanisms that should be followed to mitigate impacts.

The environmental impacts for this segment have been anticipated as low as mitigation measures should be implemented during the construction phase.

The proposed T/L route does not conflict any known important bird migration routes or areas of important biodiversity.

**AS-46**

The land use type between angle points T10 and T9 (KP 30+000) is pasture and undisturbed land. There are no environmentally sensitive areas in the vicinity of the COI. The satellite imagery shows the presence of scattered communities, vegetation and seasonal streams along the proposed T/L route. Part D - ESMP and Part E – LARF describe mechanisms that should be followed to mitigate impacts.

The environmental impacts for this segment are anticipated as low as mitigation measures should be implemented during the construction phase.

The proposed T/L route does not conflict any known important bird migration routes or areas of important biodiversity.

#### **AS-47**

The proposed T/L route runs southeast of angle point T8 (KP 40+900), traversing through pasture, seasonal streams and access roads. The environmental sensitivity has been anticipated as low as there are no sensitive areas along this segment. Part D - ESMP and Part E – LARF describe mechanisms that should be followed to mitigate impacts.

The environmental impacts for this segment are anticipated as low as mitigation measures should be implemented during the construction phase.

The proposed T/L route does not conflict any known important bird migration routes or areas of important biodiversity.

#### **AS-48**

The route passes through the sub-mountainous areas south of angle point T8 at KP 40+900 and traverses the town of Vaksh. Vaksh is about 100 km from the capital, Dushanbe. The land use types include pasture, undisturbed land, community infrastructure, irrigation canals, road and cultivated lands. Two major watercourses flow adjacent to the town of Vaksh. Part D - ESMP and Part E – LARF describe mechanisms that should be followed to mitigate impacts. The environmental impacts for this segment have been anticipated as low as mitigation measures should be implemented during the construction phase.

The proposed T/L route does not conflict any known important bird migration routes or areas of important biodiversity.

#### **AS-49**

There are no environmentally sensitive areas in this region. The proposed T/L route turns southeast of angle point T7 at KP 71+400.

The environmental impacts for this segment have been anticipated as low as mitigation measures should be implemented during the construction phase.

The proposed T/L route does not conflict any known important bird migration routes or areas of important biodiversity.

#### **AS-50**

There are no environmentally sensitive areas in this region. There are numerous seasonal streams and access roads along the proposed T/L route.

The environmental impacts for this segment have been anticipated as low as mitigation measures should be implemented during the construction phase.

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The proposed T/L route does not conflict any known important bird migration routes or areas of important biodiversity.

### **AS-51**

The proposed T/L route enters the town Bolshevik at angle point T6 (KP 87+800) and intersects cultivated lands, irrigation canals, watercourses, railroad, roads, undisturbed lands. There are no environmentally sensitive areas in this segment of the proposed T/L route. The environmental impacts for this segment have been anticipated as low as mitigation measures shall be implemented during the construction phase.

The environmental impacts for this segment have been anticipated as low as mitigation measures should be implemented during the construction phase.

The proposed T/L route does not conflict any known important bird migration routes or areas of important biodiversity.

### **AS-52**

The cities of Pervomaysk and Zamini Nav are located between T5 (KP 95+300) and T4 (KP 98+200) where the route transects agriculture land, roads, railways and seasonal streams. The proposed T/L route turns southeast of angle point T4 traversing rangelands and cultivated lands. Most of the cultivated lands are concentrated near angle point T3 at KP 104+700, near the Tajikistan-Afghanistan border. There are no environmentally sensitive areas in this segment of the proposed T/L route. The environmental impacts for this segment have been anticipated as low as mitigation measures shall be implemented during the construction phase.

The environmental impacts for this segment have been anticipated as low as mitigation measures should be implemented during the construction phase.

The proposed T/L route does not conflict any known important bird migration routes or areas of important biodiversity.

### **AS-53**

The proposed T/L route continues south of angle point T2 at KP 108+400 and traverses through the mountainous areas with an elevation of 400 m. The Tigrovaya Balka Nature Reserve occurs approximately 13 km southeast of the COI near Tajikistan-Afghanistan border. This is where the Vaksh River joins the Panj River to form the Amu Darya River. The reserve stretches over 40 km from the southwest to the northeast with a maximum elevation of 1,200 m. It is not expected to be affected by the CASA 1000 project.

The proposed T/L route traverses through the agricultural lands before it reaches angle point T1 at KP 115+900. The COI parallels an existing transmission line between angle points T2 and T1. The proposed

T/L route then crosses the Amu Darya River at the Tajikistan-Afghanistan (KP 0+00) border near Shir Khan.

The environmental sensitivity for this segment has been anticipated to be high as the route traverses an important bird area at the Tajikistan-Afghanistan border. Imam Sahib is an important bird area located in the lowland flood-plains of the Amu Darya (Oxus) river in northern Afghanistan, approximately 60 km north of Kunduz. Extensive swamp woodland formerly dominated this region: vast tracts of reeds *Phragmites* interspersed with thickets of *Tamarix* and *Salix* trees and quite large stands of *Elaeagnus* woodland. However, in recent years, a large area has been destroyed and turned into cultivation (IBA 2011). The environmental impacts for this segment have been anticipated as low as mitigation measures shall be implemented during the construction phase.

## **5.5 IMPACT ASSESSMENT**

The significance of the potential impacts from the construction and operation of the 500 KVAC interconnection line with the Kyrgyz Republic and the 500 KVDC interconnection line with Afghanistan on the physical, biological, and social environment are identified and assessed in this section. Part D - ESMP and Part E – LARF contains a set of plans to mitigate these impacts. With a robust ESMP in place, potential environmental and social impacts of the CASA-1000 project in Tajikistan can be comprehensively mitigated.

### **5.5.1 ENVIRONMENTAL**

#### **LAND**

Soil erosion during construction stage may occur in construction areas, as a result of improper runoff control and improper management of construction activities. Impacts are particularly serious in hilly areas and near streams. Land, surface water and ground water may be contaminated by spillage of chemicals, fuels, solvents, oils, paints and other construction materials such as concrete. These impacts are considered to be low, if properly managed by measures contained in the ESMP.

#### **WATER**

Local water supplies are required for the construction of the T/L and campsites. The communities already have acute water shortages and the potential for conflict between locals and the Contractor may be significant.

- Use of local water sources (wells/streams/groundwater) during construction to meet the campsite and construction requirements. Local communities are facing acute shortage of water to meet their domestic and agricultural needs. Conflicts over water use may result between the locals and contractors. While the conflict may be of limited duration it could be significant for local people;

- Siltation of Natural Streams and Irrigation Channels by excavated material carried from construction and storage areas by runoff;
- Specific impacts for the 500 KVAC interconnection line with the Kyrgyz Republic indicate that possible contamination of surface water can occur in upper part of the COI segment in Tajikistan where the rivers Aksuu and Karasu run near and in vicinity of route line. This water source is important to local communities and any contamination during construction would degrade water quality and pose a health hazard to the users. Contamination of this stream may occur due to improper chemical, materials handling or waste management during construction; and
- Specific impacts for the 500 KVDC interconnection line with Afghanistan can occur in the Vakhsh River where it runs in close proximity to the T/L. If the mitigation measures and good construction practices are followed during construction and operation, impacts will be insignificant. Siltation of natural streams may occur from excavated material.

## NOISE AND AIR QUALITY

- Ambient Air Quality: will be affected by dust and emissions from construction machinery, and vehicular traffic during the construction phase. Dust and emissions may be carried over long distances, depending on wind speed and direction, humidity and atmospheric stability. The major sources of air pollution during the construction phase are quarry areas that generate dust during the rock blasting and crushing and vehicles and machinery that would also emit particulates and gaseous pollutants. Trucks will also generate dust, particularly during loading and unloading processes.
- Noise and vibration impacts from the construction, operation, maintenance and decommissioning of the proposed transmission line: noise from construction activities would generally be emitted from equipment used for the construction of access tracks, clearing of vegetation, construction of supporting towers and associated facilities and rehabilitation. Noise from operation and maintenance activities along the proposed transmission line would be from electrical conductors and equipment used for the maintenance of access tracks, and periodic inspection of the transmission line. While the route of the proposed transmission will be within a corridor that has a relatively low population density, noise generated by the construction machinery during construction will affect near-by residents to some extent.
- Predicted noise levels from construction of the proposed transmission line would be carried out in a number of stages as follows:
  - Profile and preconstruction survey to locate structures;
  - Construction of access tracks and clearing of vegetation;
  - Installation of foundations, erection of structures and stringing of conductors and
  - Earth-wire; and
  - Easement restoration and rehabilitation.

Of the above, the noisiest activities will be during construction. Noise during the operation and maintenance of the high voltage transmission line mainly arises from maintenance activities. Audible noise during operation of the transmission line may result from minor electrical discharge caused by ionization of the air by high strength electric fields adjacent to conductor and hardware surfaces. This phenomenon is known as the “corona effect” and the levels of noise generated vary depending on the conductor surface and atmospheric conditions. Noise levels from the corona effect are generally not noticeable under normal weather conditions.

## **FLORA**

- **Agriculture and trees:** Construction activities can damage crops such as cotton and fruit orchards. Construction activities will also hinder farming activities and affect cropping intensity. Because of the relatively small number of trees in the COI and due to the fact that trees will only have to be cut if they are within 25 m of the centerline, it is unlikely that many trees will be affected during the construction of the T/L. The important species of trees within the COI include Mulberry, Apricot and Poplar. The exact number of trees that will be cut can only be determined once the location of the centerline and the towers has been fixed during the final design phase of project development. This will be done by the proponent’s contractor / consultant; and
- **Shrubs / other vegetation:** the overall impact of the T/L on shrubs and other vegetation will not be significant because of low density of shrubby vegetation and ephemeral nature of the perennial grasses. The degree of impact to the affected vegetation and vegetation cover can only be determined when the towers are fixed during the detailed design phase of project development. In any event, it will be possible to route the line and place towers to avoid significant vegetation damage.

## **FAUNA**

- **Mammals and Reptiles:** During the construction phase there will be some unavoidable negative effects on the small mammals and reptiles along the RoW. The magnitude of this effect will be low as the area of habitat affected will be small relative to the availability of similar habitat throughout the COI and surrounding areas. Furthermore as these mammals and reptiles are of limited ecological, economic and social value in the local context, the impact on their populations will not be significant. There are no significant habitats or species of rare, endangered or protected, wildlife in the COI and the overall impact on mammals and reptiles will not be significant.
- **Birds / Avian Fauna:** As most of the COI is not rich in birdlife due to lack of suitable habitat and because of the relatively benign nature of transmission lines, with simple environmentally responsible construction practices the impact on birds will not be significant. However, it is necessary to note that the black and white stork have nesting / breeding sites in the vicinity and these must be avoided during final determination of power pole location and during

construction activities . Special bird protection measures should be considered when passing through the Imam Sahim IBA.

- Fish and Aquatic Ecology: Some of rivers contain fresh water fish. In general, these species are neither protected nor of high value from ecological, economic or social point of view.



## 5.5.2 SOCIO-ECONOMIC AND CULTURAL ENVIRONMENT

The following paragraphs provide the anticipated impacts and the related measures that can be taken to mitigate the social effects that may occur during various stages of the implementation of the project. Mitigation measures are considered for each stage of the project activity.

### Design Stage:

- The alignment of the transmission line can easily be selected in such a way that settlements in the vicinity of the proposed COI will not be affected;
- Privacy is an important matter for tribal people and the activities and customs of local people must be taken into account when selecting the route alignment;
- The project can easily be routed so as to affect the minimum number of trees, which are relatively important to livelihoods in the area;
- The transmission line can easily be routed to avoid schools and settlements; and
- Avoid shifting and maximize the distance of the T/L from existing permanent structures.

### Pre-Construction Stage:

- Compensation will be made prior to occupation of the land by the Construction Contractor;
- In the event structures need to be moved or demolished, compensation will be negotiated and provided prior to project implementation; and
- The same protocols will apply to crops and productive land.

### Construction Stage:

- To avoid conflicts/disputes with local people, the project staff and contractors and their activities will be confined within clearly demarcated construction areas;
- The Contractor will dispose of materials only within designated areas;
- A worker code of conduct will be established and enforced;
- The Project will not affect the mobility of local people;
- Noise and dust emissions during the project execution will be controlled;
- The Contractor will respect and follow local norms and traditions; and
- The Contractor will respect local women; and their privacy.

#### 5.5.2.1 LAND ACQUISITION

Permanent land acquisition will not be necessary for this project, as the land surrounding the T/L towers may continue to be used for agriculture purposes. An area of 2500 m will be required for a Contractor

construction camp. Land may need to be acquired to relocate homes, but the exact number of homes that will be impacted cannot be determined, until the center line of the T/L is finalized.

The Tajik Republic has approved procedures for land allocation. Under the Law on Property, while all land belongs to the state, it is allocated for lifetime use by individuals to farmers. In case it is required for a development project, local authorities compensate the loss with comparable land within the limits of the same administrative territory.

Temporary acquisition of a land will be required for:

- Contractors' camps and facilities, i.e. storage, workshop, equipment parking and washing areas;
- Access roads for haulage, etc. utilizing land temporarily may affect its future productivity; and
- Land for construction campsites will be temporarily acquired.
- The impact of temporary land acquisition is not expected to be significant with implementation of the mitigation measures.

#### **5.5.2.2 PUBLIC INFRASTRUCTURE**

The construction stage of the proposed project may affect existing infrastructure within the eventual T/L RoW. The potential impacts on existing infrastructure are as follows:

- Road Crossings: during line stringing there may be some short term local interference with traffic movement. However, if good construction and traffic control procedures are followed, there will be no significant impact on existing roads or traffic during the construction phase of the project; and
- Power Lines: the COI does not include the crossing of an existing T/L. Good construction practices and the mitigation measures outlined below will virtually eliminate the potential for any significant impact during construction. There will be no significant impact on existing power lines during the operation stage of the project.

While some public infrastructure, such as electricity poles may have to be moved during the construction of the T/L, this will be an unusual and infrequent event. The final identification of what infrastructure will require to be moved can only be determined once the location of the centerline and the towers has been fixed during the final design phase Employment

Local residents will have the opportunity to work for the Contractor and local goods and services will be used when possible, therefore the effects on employment are expected to be positive.

#### **5.5.2.3 CROP AND TREE LOSS**

Damage may occur to crops during the construction stage of the project due to the construction of tower footings and stringing of conductors. However, magnitude of losses will depend on the location

of the centre line and the towers and the season during which the work is done. Compensation for crop and tree loss will be in accordance with the LARF/LARP.

#### **5.5.2.4 HEALTH AND SAFETY**

Construction workers may be exposed to minor nuisances from waste to serious health concerns. If mitigation measures and measures to ensure safety during construction are followed, significant impacts will not occur. Detailed safety mitigation measures are presented in Annex 8 of the ESMP.

#### **5.5.2.5 PROJECT AFFECTED PERSONS**

Population density in the COI is low; therefore the degree of contact between the work force and locals will be low. The COI has no indigenous people living in it and all local residence will be avoided during alignment and location of the towers. Contact between the local communities and the work force should be relatively easily managed. The extent of contact and the precise significance of the potential impacts on local communities and the work force during the construction period can only be determined once the location of the centre line and the towers, construction methods and work force are finalized.

Provisions for camps and minimizing community disturbance are presented in Annexes 1-3 of the ESMP.

#### **5.5.2.6 ELECTRO MAGNETIC FIELD**

There will not be any residents within 100 m of the T/L; therefore impacts of EMF are expected to be insignificant.



## 6. ESIA – AFGHANISTAN

### 6.1 BACKGROUND TO THE AFGHANISTAN ESIA

The following presents an environmental and social assessment of the CASA 1000 Project in Afghanistan. Information has been sourced from previous environmental and social assessments completed by SNC Lavalin (2009g) and complemented by newly acquired 6 m satellite imagery for the 562 km portion of the 500 HVDC cross-border T/L project in Afghanistan.

### 6.2 NATIONAL LAWS AND LEGISLATION

Since 1923, most of Afghanistan's constitutions have covered land-related issues although the majority of land related transactions are done outside the legal system<sup>36</sup>. In practice, private property holders have little protection to protect their land rights.

Afghan's Environment Law (2011) is based on international standards that recognize Afghanistan's current physical and socio-political environment. The current security climate has made it difficult for government and the judicial system to operate properly<sup>37</sup>. Afghanistan has signed, but not ratified, the Basel Convention regarding trans-boundary movement and disposal of hazardous waste, and is in the process of acceding to the Convention on Migratory Species (CMS) and the Ramsar Convention on Wetlands<sup>38</sup>.

The UN Convention on Biological Diversity (UNCBD), the UN Convention to Combat Desertification (UNCCD) and the Convention on International Trade of Endangered Species (CITES) is the governing framework for the Ministry of Agriculture and Irrigation. Afghanistan has also ratified the Vienna Convention and the Montreal Protocol, and the UN Framework Convention on Climate Change (UNFCCC).

The Ministry of Agriculture, Irrigation, and Livestock is the leading ministry for managing land affairs. The key institutions responsible for the establishment and implementation of environmental policy and land related issues in Afghanistan are:

- Community Development Councils
- National Environmental Protection Agency
- Ministry of Agriculture, Irrigation and Livestock

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<sup>36</sup> Rashid, Mohammad Sediq, Jan, Mullah, & Wakil, Mohammad. 2010. "Landmines and Land Rights in Afghanistan". *Geneva International Centre for Humanitarian Demining*: 1-19.

<sup>37</sup> Lister, Sara & Wilder, Andrew. 2005. "Strengthening Subnational Administration in Afghanistan: Technical Reform or State-Building?". *Public Administration and Development* 25: 39-48.

<sup>38</sup> Ibid

- Supreme Court of the Islamic Republic of Afghanistan;
- Community Shuras or Jirgas (Local Village Government Organizations)
- Ministry of Finance
- The General Department of Geodesy and Cartography
- Afghanistan Land Authority
- Department of Mine Clearance
- The Mine Action Coordination Centre of Afghanistan
- Ministry of Energy and Water
- Ministry of Interior
- Land Administration Agency
- Provincial Councils
- District Councils
- Municipal Councils

The following statutes are relevant to this Project in Afghanistan:

**Table C6-1: Afghanistan – Relevant Legislation**

Legislation	Year Passed (amended)	Purpose/Content
Environment Law of Afghanistan	2007	The Environmental Law of Afghanistan promulgated in 2007 is a comprehensive policy that covers most aspects of natural resources management. Article 23 requires that planning for sustainable use, rehabilitation and conservation of biological diversity, forests, rangeland and other natural resources, prevention and control of pollution, and conservation and rehabilitation of the environment from adverse effects shall be an obligatory element of all national and local land-use plans and natural resources plans developed by all relevant ministries and national institutions. Furthermore, it stipulates local communities should be involved in decision-making processes regarding sustainable natural resource management (art. 23, para 10), and that affected persons must be given the opportunity to participate in each phase of the project. (art. 19, 1)
National Environmental	2005	NEPA is the primary environmental regulatory and approval authority in the country. The Act under which NEPA was

Legislation	Year Passed (amended)	Purpose/Content
Protection Agency (NEPA)		<p>established specifies that the proponents of any project, plan, policy or activity must submit to NEPA a preliminary Environmental Assessment, in order to allow NEPA to determine the associated potential adverse effects and possible impacts. After reviewing the preliminary assessment, NEPA can either authorize - with or without conditions - the project, plan, policy or activity, provided that the potential adverse effects of the proposed activities on the environment are unlikely to be significant. Otherwise, NEPA may require the proponents to submit a detailed environmental impact statement including a comprehensive mitigation plan for its review and approval. NEPA EIA Board of Experts review, assess and consider applications and documents of the proposed projects submitted by the proponent. Acting on the advice of the EIA Board of Experts, NEPA has the option of either granting or refusing permission. Once permission is granted the proponent needs to implement the project within three years of the date of which the permission has been granted, otherwise, it will lapse. EIA Board of Expert decisions can be appealed (Art. 19). A detailed EIA procedure has been laid out by the NEPA for the proponents to follow for mandatory environmental compliance. Once the application form and other relevant documents are submitted to NEPA according to the agency EIA regulation NEPA would: (i) issue a Certificate of Compliance, with or without conditions, (ii) advise the applicant in writing to review the technical reports and address the concern of NEPA. According to the EIA regulation NEPA would grant a Certificate of Compliance or would refuse to do so and provide written reasons for the refusal to the applicant. The EIA regulations are silent on NEPA rules during implementation of the activities and projects.</p>
The Law on Land Expropriation	1894	<p>The Law sets out the provisions governing the expropriation or acquisition of land for public interest purposes, such as the establishment/construction of public infrastructure or for acquisition of land with cultural or scientific values, land of higher agricultural productivity and large gardens. It declares, inter alia, that: a) acquisition of a plot or portion of a plot land for public use is decided by the Council of Ministers and is compensated at fair value based on current market rates (Article 2); b) the right of the owner or land user will be terminated three months prior to the start of civil works on the project and after the proper reimbursement to the owner or person using the land has been made (Article 6); c) the value of land, value of houses and buildings on the land and value of trees and other assets on the land will be considered</p>

Legislation	Year Passed (amended)	Purpose/Content
		<p>for compensation ( Article 8); and f) compensation is determined by the Council of Ministers. The Law, however, does not fully address resettlement. The amended 2009 legislation still makes no special provision for a resettlement plan or indeed any arrangements for resettlement. There is reference to the fact that a better implementation regulation can be adopted (Article 22) but this is vague. A method of valuation to determine the eligibility of compensation entitlements and a framework for guiding resettlement plans is discussed in the Part E - LARF of this report.</p> <p>Afghanistan’s land acquisition policy is guided by these principles:</p> <ul style="list-style-type: none"> <li>▪ Land being fundamental to livelihoods must be preserved and protected for future generations;</li> <li>▪ Access to land should be unrestricted;</li> <li>▪ Land resources should be used efficiently through the facilitation of a transparent land market;</li> <li>▪ Land ownership and user rights should be distributed fairly to promote social justice and harmony;</li> <li>▪ And local communities should have a say in the settlement of land disputes.</li> </ul> <p>These principles reflect the philosophy of the World Bank regarding land acquisition. Social and environmental management plans are provided in this report to guide project proponents on how to implement Bank and nationally compliant environmental and social safeguard mechanisms. Land classification and ownership will need to be decided on a case-by-case basis as communal versus state versus private property etc.</p>
Law on Land	2000	<p>This law created a commission for land clarifications and is operated under the Department of Land Classification in the Ministry of Agriculture. It specifies the following documents as proof of ownership:</p> <ul style="list-style-type: none"> <li>▪ Official documents issued and validated by the courts that indicate ownership, purchase, gift, exchange, surrender, or another form of transfer;</li> <li>▪ Officially authorized purchase documents issued by an authorized government department;</li> <li>▪ Officially registered tax payment documents;</li> <li>▪ Water rights documents where there is no evidence against their authenticity and the land concerned is</li> </ul>

Legislation	Year Passed (amended)	Purpose/Content
		<p>shown in the book ownership and taxation; and,</p> <ul style="list-style-type: none"> <li>▪ Customary documents prepared before 1975, properly witnessed and submitted to an authorized government department before 1978.</li> </ul>
Law on Managing Land Affairs	2008	This Law regulates land titling and registration in addition to other aspects of managing land in Afghanistan that is the primary framework that the Ministry of Agriculture, Irrigation and Livestock operates by to identify the legitimacy of land ownership.
Law on the Preservation of Afghanistan's Historical and Cultural Heritages	2004	The Law on the Preservation of Afghanistan's Historical and Cultural Artifacts state that project's which cause destruction or harm to the recorded historical and cultural sites or artifacts is prohibited (art .11, art. 16). This law provides guidelines for how to deal with chance find procedures.
Mine Action Program for Afghanistan	1989	Procedures for mine risk management are outlined. The Department of Mine Clearance (DMC) is the mine focal point for the government of Afghanistan. The Mine Action Coordination Centre of Afghanistan (MACCA) that coordinates this Mine Action Program is funded by the UN and they are responsible for the related coordination, planning & fundraising responsibility to date. The MACCA also has sub-offices known as Area Mine Action Centers. MACCA and DMC jointly coordinate, regulate and manage mine action operations.
Female Rights to Land Ownership in Afghanistan		Female rights to all property including land is protected by the Shari'a law, the Civil Code and customary law. This law states that women are equal citizens to men. Women may dispose of their property and can enter into sharecropping arrangements.
Water Law and the Water Sector Strategy (WSS)		Local water supplies are required for the construction of the T/L and campsites. Both the new Water Law and the Water Sector Strategy (WSS) promote an integrated water resources management (IWRM) approach based on a transition towards river basin development and a strong role for local stakeholder participation. The WSS has an explicit commitment to poverty reduction and stresses the need to build the capacity of all stakeholders and support farmers and other poor water users to achieve sustainable livelihoods. In particular, end-user participation in decision making relating to water resource management, operation and maintenance of water supply systems and agreeing water use allocations is stressed. Throughout the years of conflict, NGOs developed and maintained strong links with rural communities in all provinces and the WSS proposes broadening their role to

Legislation	Year Passed (amended)	Purpose/Content
		coach Water Users Associations and members of Community Development Councils (CDCs) in conservation techniques and water management systems. Likewise, the Water Law encourages stakeholder involvement in overall planning and management and recognizes that participation is especially important at local level when problems faced by water users can be resolved more easily. NGOs are seen as having a vital role in supporting the participation of end-users through appropriate training and capacity development initiatives. Community Development Councils can be seen as an entry point for the proponent to speak directly with affected communities proposed project related activities.
Cutting of Trees (Prohibition)		This Act consists of 10 sections and regulates the cutting of trees along Afghanistan's external frontiers. It states that: It shall be prohibited, without a prior written approval of the authorized officer to cut, fell or damage any tree growing in the two zones as specified in Section 2. Penalty provisions and the fines (Section 6) shall vary depending on the zone and the nature of the offence. The provincial governments are also empowered to make rules for achieving the Act goals.
Telegraphy Act	1991	This Act is related specifically to the any installation of telegraph poles and stringing and it makes provision for the installation of installing poles/towers without acquiring any land. However, a provision is made for the temporary acquisition of land as required during the construction period and as such, a compensation process is specified for the loss of crops for a specific period of time.
Antiquities Act		This Act relates to the protection, preservation and conservation of archaeological/historical sites and monuments.
Afghanistan Penal Code		This Code deals with offences where public or private property and/or human lives are affected due to the intentional or accidental misconduct of an individual or group of people.

### 6.3 ENVIRONMENTAL AND SOCIAL SETTING

The following is a general description of the natural and human environments along the CASA 1000 RoW in Aghanistan. Additional information is also provided in the description of the environmental and social alignment sheets that follow. A description of the individual Alignment Sheets for the 500 KVDC line can be found Appendix 3.

### 6.3.1 PHYSICAL ENVIRONMENT

The proposed T/L from Tajikistan to the Afghanistan border crosses rivers, relatively level and barren agricultural areas, sub-mountainous terrain, and desert.

#### **CLIMATE:**

Afghanistan has four distinct seasons. Winters are generally harsh and summers are hot and dry. Kabul's winter temperatures reach lows of -10°C and summers reach highs of 35°C. Whereas, in Jalalabad the average winter temperature is 4°C and summer is 46°C. Rainfall in Kabul is less than 1 m a year and Jalalabad's average rainfall is 30 to 35 cm a year.

#### **SOIL:**

Approximately 75% of the COI traverses mountainous terrain with various types of exposed rocks and no soil cover. The portion of the line near the Kabul-Jalalabad road has fertile soils appropriate for agricultural operations. The geology of the area is suitable for transmission line construction.

#### **GEOLOGY:**

The majority of the COI traverses mountainous terrain with various types of exposed rocks and no soil cover. The major part of the COI in Afghanistan runs through the mountainous terrain of the Hindu Kush Range and Salang hills. The exposed rocks include sedimentary and metamorphic formations of the Carboniferous to Pre-Cambrian periods. Among the major rock types are sandstones, silt, shales, phyllites, marbles, quartzites, and schists and carbonate rocks.

#### **LAND USE:**

The COI is very dry and poorly vegetated with low biological diversity due to the limited rainfall, poor soil and decades of over exploitation. Wherever there are shrubs and bushes they are trimmed for fodder and fuel wood. Fuel wood is short in supply pushing people to work intensely in agricultural spaces. There are few trees in the COI and the majority of the trees that do exist are fruit trees.

Biodiversity in Afghanistan is generally low because of water shortages, minimal rainfall and poor soil. Vegetation is also sparse due to excessive exploitation in the vicinity of the COI.

There are no reserve forests or protected areas in the COI.

#### **AGRICULTURE:**

The most valuable trees that are found in the COI are fruit trees. The following fruit trees are found along the COI: almond, apple, apricot, banana, berry, citron, date, fig, grapes, loquat, melon, mulberry,

olive, orange, peach, pear, pistachio, plum, pomegranates, quince, rhubarb, vine, and walnut. Poppy production for illicit drug use and trade is one of the largest crops grown for profit in Afghanistan<sup>39</sup>.

**WATER:**

There are seven perennial rivers along the proposed T/L route in Afghanistan. The Kabul River is used for agricultural activities. There are two irrigation canals in the COI, one is near the Tajikistan border and the other is near Jalalabad. Groundwater quality is poor due to the contamination from mines but it is used for agricultural activities.

**AIR AND NOISE QUALITY:**

The ambient air quality is generally good and pollution free. The only noise source in the area is from traffic on Bandar Sher Khan Road, Pul-e-Kumari, Doshi Road, Khenjan-Salang Road, Salang-Kabul Road and Kabul-Jalalabad-Torkham Road.

**6.3.2 BIOLOGICAL ENVIRONMENT**

**FLORA:**

There is sparse vegetation in the level plains and hilly areas in the vicinity of Sher Khan and around Pul-e-Khumri is barren. The hills of Doshi, Salang, and Tangi Abrishom Pass are rocky and devoid of virtually all vegetation. There are no reserve forests or protected areas in the COI.

**FAUNA:**

Wildlife is rarely present near the COI. The following animals are known in the area: Himalayan lynx, Indian crested porcupine, jackal, leopard cat, red fox, snow leopard, wolves, squirrels, bats, rabbits, wild hare, mongooses, mice and rats. Reptiles such as snakes, scorpions and lizards as well as flies, mosquitoes and soil dwelling arthropods are common in the area. The following endangered wildlife species are found in Afghanistan: wolf, leopard, leopard cat, Siberian ibex, and Capra ibex. Due to the lack of suitable habitat for these species, it is unlikely they will be found in the COI.

Birds are common in the COI because of the surface water and agricultural fields. Common species are: pigeon, parrot, dove, myna, owl, house sparrow, common teal, eagle owl, peregrine falcon, kestrel, bulbul, ceoq, kite, duck, quail, and partridge.

The following aquatic species are known: Khardar, laqa, marmahi and Peshawrimahi are found in the Kunduz, Kabul, and Jalalabad Rivers. Some fishing for personal consumption occurs in the Kunduz and Kabul rivers.

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<sup>39</sup>Farrell, Graham & Thorne, John. 2005. "Where have all the flowers gone?: evaluation of the Taliban crackdown against opium cultivation in Afghanistan". *International Journal of Drug Policy* 16: 81-91.

The Siberian Crane is an endangered bird in Afghanistan. This species of habitat has not been seen in the COI. With the exclusion of some residual areas in Central and Eastern Afghanistan where Snow Leopard habitats are recognized, no other rare or endangered habitats or wildlife have been identified within the COI.

There are no wildlife sanctuaries, endangered species or habitats or significant wetlands within or in the vicinity of the COI.

### 6.3.3 SOCIO-CULTURAL ENVIRONMENT

There are two houses that make up Afghanistan's National Assembly: the lower house (the house of people) and the upper house (the house of elders). Women have 25% of the seats in the lower house and almost 17% in the upper house. Tribal systems order the majority of rural residents. Afghanistan's public sector consists of: central government, 34 provinces, and 364 municipalities and districts as well as various state enterprises. Some local jirgas or shuras are also influential.

Afghanistan faces serious political instability and legitimacy to rule, and, the contamination of land mines on agricultural land, pastoral land, roads and access to water ways to water sources put those living and working there at serious risk. According to a recent report, "in 2009, an average of more than 40 people each month were injured or killed by landmines and explosive remnants of war (boys 48 per cent, men 37 per cent, girls 8 per cent, and women 7 per cent)" <sup>40</sup>(Rashid et al 2010: 5)

About 26 settlements are located along the project corridor. The majority of the residents live in rural settlements with populations of 500-9000. There are eight settlements located within the COI that can be avoided with judicious route selection. The settlements within the COI are: Omarkhyel, Bamyan, Tbp dara area, Oarabagh, Cheshma-e-Dogh, Oala-e-Moradbig, Mahipar, and MarkoBazar.

Seven main ethnic groups and six main tribes reside along the COI. Each tribe has their own traditions and customs. Dari and Pashto are the common languages spoken in the area.

As of 2006, 45 percent of the population was under 15 years old, 2 percent was older than 64 and the average house consisted of 10 to 18 residents. The literacy rate of the population within the COI is 36 percent due to insufficient funds, unsafe schools, and a long history of war and occupation. The literacy rate for women is far behind to that of the men.

The majority of the land in the COI is rough and mountainous with very little vegetation and generally unused. Flat areas near water resources support agricultural activities. Between Jablussaraj and Kabul, and between Surkh Dewaland Torkham. The average yield of wheat is 2,721 kg/ha and 1,217 kg/ha for maize. However, a lot of agricultural lands have become unusable because of destroyed irrigation systems and land mines. An average household owns 1.2 ha of agricultural land.

<sup>40</sup> Rashid, Mohammad Sediq, Jan, Mullah, & Wakil, Mohammad. 2010. "Landmines and Land Rights in Afghanistan". *Geneva International Centre for Humanitarian Demining*: 1-19.

The common sources of income for local residents in the COI are agriculture, daily wage labor, transportation and small businesses. The average annual household spends over 75 percent of their annual income on basic food needs. More than 67 percent of residents live in mud houses, the remainder of the population lives in homes that are built with various amounts of concrete. The water sources include nearby streams, springs, and rivers that are heavily contaminated by land mines. Approximately 50 percent of the population has access to electricity but not to health facilities, schools and paved roads.

Common issues that women in Afghanistan currently face are:

- Limited participation in Government;
- Recognition of land ownership and rights;
- Extremely low literacy rates (nationally 87.4 % of women can not read or write);
- Violence;
- Exclusion from local jirgas and shuras; and
- Local customs that place restrictions on working outside of village residence.

It was estimated that about 67 homes and more than 26 items of public infrastructure may be affected by the Project.

#### **PUBLIC CONSULTATIONS:**

Local residents and potentially affected people were consulted during the field survey. Information about the Project was shared and discussions were held regarding potential environmental and social impacts, including concerns and issues of the local people.

The following stakeholders were identified:

- Project Affected Persons (PAPs)
- Local residents/tribe elders
- Ministry of Energy and Water (EA)
- Ministry of Interior
- Other Ministries (agriculture and food; public works, communications and other concerned)
- Other provincial/district agencies (land administration, municipalities, councils, community shuras/jirgas)
- Non-Governmental Organizations (NGOs)

## **6.4 ENVIRONMENTAL AND SOCIAL ALIGNMENT SHEET DESCRIPTION**

### **6.4.1 ALIGNMENT SHEET DESCRIPTION FOR THE 500 KVDC LINE**

The alignment sheets were generated based on the information available from the SNC Lavalin (2009g) and purchased satellite imagery. The total length of the HVDC transmission line in Afghanistan is 562 km. A description of each of the alignment sheets follows; detailed sheets are provided in Part G of this ESIA/ESMP.

#### **AS-54**

At the Tajikistan-Afghanistan border, T/L route crosses the Amu River (Panji River). The COI transects the community infrastructure of Sher Khan Bandar and a religious site at KP 0+400. The COI includes a large river crossing, community infrastructure, roads and vegetated areas between angle points A1 and A2 (KP 9+900). The environmental impacts for this segment have been anticipated as low. Part D - ESMP and Part E – LARF describe mechanisms that should be followed to mitigate impacts during the construction phase. The proposed T/L route does not conflict with any known important bird migration routes.

#### **AS-055**

The T/L route passes through a level area that is primarily desert with intermittent trees. The route parallels the road to Kunduz (Qonduz). There are no environmentally sensitive areas in this segment of the proposed T/L route.

The environmental impacts for this segment have been anticipated as low. The proposed T/L route does not conflict with any known important bird migration routes.

#### **AS-056**

The T/L route continues through and parallels the road before and after it changes direction at angle point A3 (KP 29+500). There are no environmentally sensitive areas in this segment of the proposed T/L route.

#### **AS-057**

The T/L route continues through a dry desert-like area and parallels the road through angle point A4 (KP 40+900). There are no environmentally sensitive areas in this segment of the proposed T/L route.

The environmental impacts for this segment have been anticipated as low as mitigation measures should be implemented during the construction phase. The proposed T/L route does not conflict with any known important bird migration routes.

#### **AS-058**

The desert continues south until about 1 km from Kunduz River where the T/L route traverses cultivated land up to angle point A5 (KP 51+700). South of angle point A5, portions of agriculture land, dense community infrastructure of Kunduz, and various roads are transected by the T/L route. Kunduz is the capital of Kunduz Province of Afghanistan. There are no environmentally sensitive areas in this segment of the proposed T/L route.

The environmental impacts for this segment have been anticipated as low as mitigation measures should be implemented during the construction phase.

The proposed T/L route does not conflict with any known important bird migration routes.

#### **AS-059**

The T/L route continues through Kunduz and transects Kunduz River at angle point A6 (KP 64+400) and three other places. Agriculture land is also transected by the route throughout AS-059. The COI includes numerous watercourse crossings, community infrastructure and vegetated areas. Part D – ESMP and Part E – LARF describes mitigation measures that should be taken. See the list of known environmental agencies provided above in the National Frameworks section for assistance.

The proposed T/L route does not conflict with any known important bird migration routes.

#### **AS-060**

Aliabad town, intermittent gardens, subroads and Kunduz River are all traversed by the T/L route. Kunduz River is transected in three locations, one being angle point A7 (KP 75+100). There are no environmentally sensitive areas in this segment of the proposed T/L route.

The environmental impacts for this segment have been anticipated as low as ESMP mitigation measures should be implemented during the construction phase. The proposed T/L route does not conflict with any known important bird migration routes.

#### **AS-061**

The T/L passes through angle points A8 (KP 88+400) and A9 (KP 91+900), the village of Jelogeer and Kunduz River and then into rocky terrain. Areas where the COI includes close community proximity, roads and watercourse crossings are considered medium environmental sensitivity.

The overall environmental impacts for this segment have been anticipated as low as ESMP mitigation measures should be implemented during the construction phase. The proposed T/L route does not conflict with any known important bird migration routes.

**AS-062**

The villages of Chahar –Shamba-Tepa, Mahajer and New Baghlan City are in the COI of the T/L route. The main road to Kabul is very close, but the proposed T/L route does not cross the road. Kunduz and Old Baghlan Rivers are crossed by the COI. Angle point A11 at KP 110+000 is just southwest of the Old Baghlan River. There are no environmentally sensitive areas in this segment of the proposed T/L route.

The environmental impacts for this segment have been anticipated as low as ESMP mitigation measures should be implemented during the construction phase. The proposed T/L route does not conflict with any known important bird migration routes.

**AS-063**

The T/L route continues through the community infrastructure of Mahajer Village, Baghlan City, and Quarghata Village. The COI includes the New Baghlan River, as well as cultivated land and community infrastructure. Part E – LARF provides guidance about land acquisition; valuation of public infrastructure; and negotiations with moveable property. There are no environmentally sensitive areas in this segment of the proposed T/L route. See the list of known environmental agencies provided above in the National Frameworks section for assistance.

The environmental impacts for this segment have been anticipated as low as ESMP mitigation measures should be implemented during the construction phase. The proposed T/L route does not conflict with any known important bird migration routes.

**AS-064**

Mahajer Village, Baghlan City, and Quarghata Village are transected by the T/L route. The route continues to angle point A12 at KP 125+600, through Hashim Khan Bridge on Baghlan River and into a mountainous area to angle point A13 (KP 133+700). The COI includes a large watercourse and cultivated land. Part E - LARF provides mitigation measures with cultivated land. There are no environmentally sensitive areas in this segment of the proposed T/L route.

The environmental impacts for this segment have been anticipated as low as ESMP mitigation measures should be implemented during the construction phase. The proposed T/L route does not conflict with any known important bird migration routes.

**AS-065**

The T/L passes through a mountainous area then through cultivated land of the nearby communities of Qurghata Village and Umarkhayl Village and through community infrastructure, roads and watercourses of Kokan, Pole-eKhomri, Umarkhayl Village. Angle point A14 at KP 139+900 is located on AS-065. The environmental sensitivity has been anticipated as medium due to the crossing of Pulikhumri and Baghlan Rivers and agricultural areas. Part D – ESMP and Part E – LARF describes mitigation measures that should be taken. See the list of known environmental agencies provided above in the National

Frameworks section for assistance. The environmental impacts for this segment have been anticipated as low as ESMP mitigation measures should be implemented during the construction phase. The proposed T/L route does not conflict with any known important bird migration routes.

**AS-066**

The T/L route continues through Pole-eKhomri, Umarkhayl Village and roads in the dense community infrastructure of Kokan. The route briefly goes into a very rocky area to angle point A15 at KP 157+500 before it intersects Hashemkahan Bridgem Ghorri Cement Firm and Pulikhumri River. A76 Highway is in the vicinity of the COI. The environmental sensitivity has been anticipated as medium in areas with high density of community infrastructure. Other areas have an environmental sensitivity anticipated as medium due to watercourse crossings and cultivated land. Part D – ESMP and Part E – LARF describes mitigation measures that should be taken. See the list of known environmental agencies provided above in the National Frameworks section for assistance. The environmental impacts for this segment have been anticipated as low. The proposed T/L route does not conflict with any known important bird migration routes.

**AS-067**

The T/L route crosses Pulikhumri River, roads and the community of Pole-eKhomri, and then navigates through a mountainous area to angle point A16 (KP 168+400). There are no environmentally sensitive areas in this segment of the proposed T/L route.

The environmental impacts for this segment have been anticipated as low as ESMP mitigation measures should be implemented during the construction phase. Part D – ESMP and Part E – LARF describes mitigation measures that should be taken. See the list of known environmental agencies provided above in the National Frameworks section for assistance. The proposed T/L route does not conflict with any known important bird migration routes.

**AS-068**

The T/L passes through a mountainous area and enters Karaka Village at Angle point A17 (KP 174+500), passing through the Pulikhumri River into another mountainous area at Angle point A18 (KP 180+400). The COI includes watercourse crossing and cultivated lands. There are no environmentally sensitive areas in this segment of the proposed T/L route.

The environmental impacts for this segment have been anticipated as low as ESMP mitigation measures should be implemented during the construction phase. The proposed T/L route does not conflict with any known important bird migration routes.

**AS-069**

The T/L route enters the Doshi River valley and crosses the river to angle point A19 (KP 184+900). The river, cultivated land and community infrastructure surrounds angle point A19. From angle points A19

to A20 (KP 191+500), the route mostly transects a rocky, mountainous area. The route crosses Doshi River twice before angle point A20. There are no environmentally sensitive areas in this segment of the proposed T/L route.

The environmental impacts for this segment have been anticipated as low as ESMP mitigation measures should be implemented during the construction phase. The proposed T/L route does not conflict with any known important bird migration routes.

#### **AS-070**

Doshi River (also known as Salang River) is very close to the T/L route near angle point A21 (KP 192+500). About half of the route between angle points A21 and A22 the river parallels the COI. The town of Doshi is in the river valley and is surrounded by mountains in which the angle points of the T/L route are located. The T/L route runs through a rocky area to angle point A23 (KP 198+000) and into another mountainous area to angle point A24 at KP 200+200. The environmental sensitivity has been anticipated as medium due to the watercourse crossing, steep slopes and the wild fruit trees growing in Doshi. Part E – LARF provides guidance for tree compensation if such mitigation measures are triggered. The environmental impacts for this segment have been anticipated as low as ESMP mitigation measures should be implemented during the construction phase. Part D – ESMP and Part E – LARF describes mitigation measures that should be taken. See the list of known environmental agencies provided above in the National Frameworks section for assistance. The proposed T/L route does not conflict with any known important bird migration routes.

#### **AS-071**

The T/L route remains mostly in rocky terrain though this segment but is parallel to the river valley. The route crosses Salang River NW of angle point A25 (KP 202+200) and is intermittently parallel to the Hairatan T/L and crosses Kuru and Gazan Canals. Angle point A26 (KP 207+800) is located near the main road (A76 Highway) through the valley. The COI includes watercourse crossings and the steep slopes. There are no environmentally sensitive areas in this segment of the proposed T/L route.

The environmental impacts for this segment have been anticipated as low as ESMP mitigation measures should be implemented during the construction phase. The proposed T/L route does not conflict with any known important bird migration routes.

#### **AS-072**

The T/L route continues to follow the Salang River valley, A76 Highway and intermittently, the Hairatan T/L. The route crosses a heavily vegetated area and a watercourse near angle point A27 (KP 218+600) and again through the town of Khinjan near angle point A28 (KP 221+300). The environmental sensitivity has been anticipated as medium due to the vegetated area, watercourse crossings and the steep slopes. Guides for land acquisition if triggered are provided in Part E – LARF of this report.

The environmental impacts for this segment have been anticipated as low as ESMP mitigation measures should be implemented during the construction phase. The proposed T/L route does not conflict with any known important bird migration routes.

#### **AS-073**

The T/L crosses the middle of the Salang Kotal Important Bird Area (IBA), SE of angle point A28. The Salang Kotal IBA is described as the highest pass on A76 Highway from Kabul to the north of Afghanistan down to Khinjan. The COI passes through the extensive mulberry *Morus* orchards in Khinjan. Several species of Himalayan breeding birds are found in this area, including *Grus leucogeranus* which is Critically Endangered.

Angle points A29 (KP 226+100), A30 (KP 229+800) and A31 (KP 232+700) are located in this portion of the route. Community infrastructure, cultivated lands, Salang River (Pansheer River) and A76 Highway are intermittently parallel to the route and are crossed in many locations. The steep slopes are covered with *Juniperus* and patches of *Salix* near the Salang River. The environmental sensitivity has been anticipated as high due to the presence of an important bird area and the steep slopes.

Special bird protection measures as documented in Part D - ESMP should be implemented in this area or rerouting considered. Part D – ESMP and Part E – LARF describes mitigation measures that should be taken. See the list of known environmental agencies provided above in the National Frameworks section for assistance.

#### **AS-074**

IBA Salang Kotal continues through angle points A32 (KP 235+500), A33 (KP 236+700), A34 (KP 240+400), and A35 (KP 246+300). This section of the T/L route remains in the river valley and crosses Salang (Pansheer) River twice. The steep slopes are covered with *Juniperus* and patches of *Salix* near the river. The environmental sensitivity between angle point A31 and A34 has been anticipated as high as the proposed T/L route passes through Salang Kotal (IBA) and also due to the steep slopes. The environmental sensitivity has been anticipated as low from angle point A34 due to the route traversing rocky areas with no watercourse crossings, cultivated lands or community infrastructure.

Special bird protection measures as documented in Part D - ESMP should be implemented in this area or rerouting considered. See the list of known environmental agencies provided above in the National Frameworks section for assistance.

#### **AS-075**

The T/L route crosses intermittent streams and Salang (Pansheer) River. The T/L enters the Salang Pass and Deer Habitat was identified in the river valley alongside angle points A36 (KP 247+300), A37 (KP 251+700), A38 (KP 252+700), and A39 (KP 257+800) by SNC. Elevations in this area rise to 3800 m. The route continues to transect the IBA Salang Kotal up to angle point A39. The steep slopes are covered with *Juniperus* and patches of *Salix* near the river. The environmental sensitivity has been anticipated as

high up to A38 and high from A38 to the end of the alignment sheet due to the IBA. If compensation mitigations measures are triggered Part E – LARF provides guidance towards this end.

Special bird protection measures as documented in Part D - ESMP should be implemented in this area or a reroute considered.

#### **AS-076**

The T/L route traverses steep to moderate slopes in this section near the Salang River. The land between angle points A40 (KP 262+600) and A41 (KP 268+500) is undisturbed. Highway A76 and the Salang River are transected by the COI between angle point A41 to A42 (KP 270+500). The environmental sensitivity has been anticipated as medium in areas where the route deviates close to/crosses the river valley.

The environmental impacts for this segment have been anticipated as low as mitigation measures should be implemented during the construction phase. The proposed T/L route does not conflict with the important bird migration routes.

#### **AS-077**

The T/L route follows the road into the Afghanistan province of Parwan and crosses the Salang River before it changes direction at angle point A43 (KP 276+200). The route continues to follow the road throughout the alignment sheet and it traverses Bilandi Village and Baba Mardan Village, Bugs-Lala Village, Kngar Bridge, and a pedestrian bridge between angle point A43 to just south of angle point A44 (KP 282+100). Angle point A45 (KP 285+100) is located on the east side of the river valley in rocky terrain. The environmental sensitivity has been anticipated as medium in areas where the route deviates close to/crosses the river valley and community infrastructure. Consider rerouting if compensation outweighs land value. The environmental sensitivity is anticipated as low in areas of undisturbed, rocky land. Part D – ESMP and Part E – LARF describes mitigation measures that should be taken. See the list of known environmental agencies provided above in the National Frameworks section for assistance.

The environmental impacts for this segment have been anticipated as low as ESMP mitigation measures should be implemented during the construction phase. The proposed T/L route does not conflict with any known important bird migration routes.

#### **AS-078**

The Salang River and the dense community infrastructure of Jabal os Serai is transected by the proposed T/L route. Cultivated land is dominant from angle points A46 (KP 288+000) to A47 (KP 291+000). The environmental sensitivity is anticipated as medium in the densely populated areas. Part D – ESMP and Part E – LARF describes mitigation measures that should be taken. See the list of known environmental agencies provided above in the National Frameworks section for assistance.

The environmental impacts for this segment have been anticipated as low as ESMP mitigation measures should be implemented during the construction phase. The proposed T/L route does not conflict with any known important bird migration routes.

**AS-079**

The T/L route continues to transect dense community infrastructure through angle point A48 at KP 302+900. The dominant agriculture and cultivated land continues from Jabal os Serai to Chatikar. Due to the community proximity, the environmental sensitivity is anticipated as high throughout this alignment sheet. Consider rerouting if compensation outweighs land value. Part D – ESMP and Part E – LARF describes mitigation measures that should be taken. See the list of known environmental agencies provided above in the National Frameworks section for assistance.

The environmental impacts for this segment have been anticipated as low ESMP mitigation measures should be implemented during the construction phase. The proposed T/L route does not conflict with any known important bird migration routes.

**AS-080**

The dense community infrastructure and cultivated land of Qarabagh City is also transected by the T/L route. Sub-roads and a watercourse are crossed south of angle point A49 (KP 314+700). The environmental sensitivity is anticipated as high due to the community proximity. Part D – ESMP and Part E – LARF describes mitigation measures that should be taken. See the list of known environmental agencies provided above in the National Frameworks section for assistance.

**AS-081**

The T/L route crosses Qala-e-Gulbaz Village and Kabul River near angle point A50 (KP 329+300). Although Pulicharkhi village is traversed near the end of this segment, sandy, undisturbed land is dominant in this alignment sheet. The environmental sensitivity is anticipated as low as communities are not affected by the T/L activities. If compensation and stakeholder participation mitigation measures are triggered Part E – LARF provides guidance towards this end. Part D – ESMP and Part E – LARF describes mitigation measures that should be taken. See the list of known environmental agencies provided above in the National Frameworks section for assistance.

The environmental impacts for this segment have been anticipated as low as ESMP mitigation measures should be implemented during the construction phase. The proposed T/L route does not conflict with any known important bird migration routes.

**AS-082**

Pulicharkhi village continues in the COI up to angle point A51 (KP 341+700) then the T/L route crosses a watercourse and enters Dehiyhia Village where cultivated land is sporadic up to angle point A53 (KP 349+400). Part E – LARF provides guidance compensating with cultivated land and stakeholder

participation. There is no angle point A52 identified at this location. From angle point A53 (KP 349+400) to the end of this section, dense community infrastructure and cultivated land are transected. The environmental sensitivity is anticipated as high due to the community proximity and watercourse crossing. Part D – ESMP and Part E – LARF describes mitigation measures that should be taken. See the list of known environmental agencies provided above in the National Frameworks section for assistance.

The environmental impacts for this segment have been anticipated as low as ESMP mitigation measures should be implemented during the construction phase. The proposed T/L route does not conflict with the important bird migration routes.

#### **AS-083**

The proposed T/L route continues through Dehiyhia Village and crosses a watercourse before traversing the “Salt Pit” (a CIA Interrogation Site), a tank cemetery and a Military Training Centre near angle points A54 (KP 361+700) and A55 (KP 364+400). This segment includes Pulucharkhi Bridge, Pulucharkhi Prison Road and the Sorobi T/L in the COI. The environmental sensitivity in this segment is anticipated as high due to the community proximity and military/conflict zone. The environmental impacts for this segment have been anticipated as low as ESMP mitigation measures should be implemented during the construction phase. The proposed T/L route does not conflict with any known important bird migration routes. Part D – ESMP and Part E – LARF describes mitigation measures that should be taken. See the list of known environmental agencies provided above in the National Frameworks section for assistance.

#### **AS-084**

The proposed T/L route traverses the Sorobi T/L, a watercourse, a cultural site (Radio Afghanistan Kabul), and Military/conflict zones (Pul-i-Charkhi Prison, a Military Training Centre, and Airborne Regiment). Angle points A56 (KP 368+800), A57 (KP 372+100) and A58 (KP 376+100) are in this alignment sheet. Dry conditions prevail in this region with sparse vegetation. The environmental sensitivity is anticipated as medium near the cultural site and military/conflict zone. The environmental impacts for this segment have been anticipated as low as ESMP mitigation measures should be implemented during the construction phase. Part D – ESMP and Part E – LARF describes mitigation measures that should be taken. See the list of known environmental agencies provided above in the National Frameworks section for assistance.

The proposed T/L route does not conflict with any known important bird migration routes.

#### **AS-085**

Desert like conditions are prevalent throughout this segment. The proposed T/L route crosses through a small community near angle point A59 (KP 381+100). A cultural site is present between angle point A60 (KP 384+400) and A61. No details of the cultural site are available. A watercourse is transected east of angle point A60. Part D – ESMP and Part E – LARF describes mitigation measures that should be taken.

See the list of known environmental agencies provided above in the National Frameworks section for assistance.

The environmental impacts for this segment have been anticipated as low as ESMP mitigation measures should be implemented during the construction phase. The proposed T/L route does not conflict with any known important bird migration routes.

**AS-086**

The proposed T/L route continues through arid areas through angle points A61 (KP 390+700) and A62 (KP 395+200) in this segment. The route traverses a large watercourse near angle point A63 (KP 399+900) that appears to be dry with no vegetation. The environmental sensitivity is anticipated as medium for the section that crosses the river bed as ESMP mitigation measures should be implemented.

The environmental impacts for this segment have been anticipated as low as ESMP mitigation measures should be implemented during the construction phase. The proposed T/L route does not conflict with any known important bird migration routes.

**AS-087**

Sandy, dry conditions prevail in this segment of the COI up to angle point A64 at KP 404+900. The proposed T/L route transects a watercourse, a road and community infrastructure between angle points A64 and A65 (KP 409+000). The Near Threatened Species, *Falco jugger* is a resident bird that is commonly found at Lake Sarobi, a man-made lake that is approximately 2 km across and is located approximately 2km NE of angle point A65. The environmental sensitivity is anticipated as medium where the T/L route traverses the community and watercourse. From angle point A65 the T/L route traverses a rocky mountainous area where the environmental sensitivity is anticipated as low.

Special bird protection measures documented in Part D - ESMP will provide guidance.

**AS-088**

The proposed T/L enters the Jalalabad Valley Important Bird Area (IBA) at angle point A66 (KP 412+800). The low-lying valley is home to Indo-Malayan bird species that are not found elsewhere in Afghanistan. The IBA trigger species in the Jalalabad Valley are *Falco jugger* (Near Threatened), and *Neophron percnopterus* (Endangered). The IBA continues through the river valley including angle points A67 (KP 416+800), A68 (KP 417+900), A69 (KP 421+700) and A70 (KP 423+200). The proposed T/L route traverses the rocky, mountainous slopes of the river valley where small rivers are crossed; however, there is a possibility of collision risk for avian species along the migratory routes in this area. The environmental sensitivity is anticipated as high in this segment because of the IBA (IBA, 2011).

Special bird protection measures as documented in the Part D - ESMP should be implemented in this area or a reroute considered.

**AS-089**

The proposed T/L route continues in the Jalalabad valley and parallels Surobi River and the A01 Highway. Several watercourses are transected. Angle points A71 (KP 430+600), and A72 (KP 435+900) are in this section of the route. There is a possibility of collision risk for avian species along the migratory routes in this area. The environmental sensitivity is anticipated as high in this segment because of the IBA (IBA, 2011).

Special bird protection measures as documented in Part D - ESMP should be implemented in this area or a reroute considered.

**AS-090**

The proposed T/L route crosses a sandy level area in the Jalalabad Valley IBA. A73 (KP 439+800), A74 (KP 455+700) are surrounded by small watercourse crossings. There is a possibility of collision risk for avian species along the migratory routes in this area. The environmental sensitivity is anticipated as high in this segment because of the IBA.

Special bird protection measures as documented in Part D - ESMP should be implemented in this area or a reroute considered.

**AS-091**

The proposed T/L route is very close to the highway in this segment of the Jalalabad Valley IBA. There are intermittent streams throughout the undisturbed land and angle point A75 is located at KP 455+400. There is a possibility of collision risk for avian species along the migratory routes in this region. The environmental sensitivity is anticipated as high in this segment because of the IBA.

Special bird protection measures as documented in Part D - ESMP should be implemented in this area or a reroute considered.

**AS-092**

The community Khayrow Khel is north of Kabul River, outside of the COI. The T/L route is located in undisturbed sandy land where small streams are transected up to angle point A76 (KP 464+400). From angle point A76 onwards, there are more stream crossings, but the community proximity is a socio-cultural concern. Part D – ESMP and Part E – LARF describes mitigation measures that should be taken. See the list of known environmental agencies provided above in the National Frameworks section for assistance.

There is a possibility of collision risk for avian species along the migratory routes in this region. The environmental sensitivity is anticipated as high in this segment because of the IBA.

Special bird protection measures as documented in Part D - ESMP should be implemented in this area or a reroute considered.

**AS-093**

The proposed T/L route traverses the IBA from angle point A77 (KP 471+200) and ends at angle point A78 (KP 472+700). Darunta River and Darunta community infrastructure are crossed by the COI. There is a possibility of collision risk for avian species along the migratory routes in this area. The environmental sensitivity is anticipated as high in the portion of the segment that is within the IBA.

Special bird protection measures as documented in Part D - ESMP should be implemented in this area or a reroute considered.

**AS-094**

The proposed T/L transects an undisturbed semi-mountainous area up to angle point A79 (KP 488+700). From A79 towards Kama River, dense community infrastructure and cultivated land is traversed. The environmental sensitivity is anticipated as high from angle point A79 due to the community proximity. Consider rerouting if compensation outweighs land value. Part D – ESMP and Part E – LARF describes mitigation measures that should be taken. See the list of known environmental agencies provided above in the National Frameworks section for assistance.

The environmental impacts for this segment have been anticipated as low as ESMP mitigation measures should be implemented during the construction phase. The proposed T/L route does not conflict with any known important bird migration routes.

**AS-095**

The dense community infrastructure and cultivated land is dominant in this segment of the T/L route. Kama River is crossed by the proposed T/L route and the route enters a mountainous area. The environmental sensitivity is anticipated as high due to the community proximity. Consider rerouting if compensation outweighs land value. Part D – ESMP and Part E – LARF describes mitigation measures that should be taken. See the list of known environmental agencies provided above in the National Frameworks section for assistance.

The environmental impacts for this segment have been anticipated as low as ESMP mitigation measures should be implemented during the construction phase. The proposed T/L route does not conflict with any known important bird migration routes.

**AS-096**

The proposed T/L route traverses the mountains up to angle point A80 (KP 508+500) where land use is predominantly agriculture. The environmental sensitivity is anticipated as high due to the cultivated land being transected by the proposed T/L. The environmental impacts for this segment have been

anticipated as low as ESMP mitigation measures should be implemented during the construction phase. The proposed T/L route does not conflict with any known important bird migration routes. Part D – ESMP and Part E – LARF describes mitigation measures that should be taken. See the list of known environmental agencies provided above in the National Frameworks section for assistance.

**AS-097**

The proposed T/L transects the community of Batawul, surrounding agricultural land and a watercourse. An irrigation canal is located in the COI near angle point A81 (KP 525+300). The environmental sensitivity is anticipated as high due to the community infrastructure and cultivated land being transected by the T/L route. Consider rerouting if compensation outweighs land value. Part D – ESMP and Part E – LARF describes mitigation measures that should be taken. See the list of known environmental agencies provided above in the National Frameworks section for assistance.

The environmental impacts for this segment have been anticipated as low as ESMP mitigation measures should be implemented during the construction phase. The proposed T/L route does not conflict with any known important bird migration routes.

**AS-098**

Communities along the proposed T/L route in this segment include Mohmand Darrah and Hazar Now, both located south of Jalalabad River (also known as Kabul River). There is one watercourse crossing identified in the COI within the dense community infrastructure. The environmental sensitivity is anticipated as high due to the community infrastructure and cultivated land being transected by the T/L route. The environmental impacts for this segment have been anticipated as low as ESMP mitigation measures should be implemented during the construction phase. The proposed T/L route does not conflict with any known important bird migration routes. Part D – ESMP and Part E – LARF describes mitigation measures that should be taken. See the list of known environmental agencies provided above in the National Frameworks section for assistance.

**AS-099**

The community of Hazar Now continues to be transected by the proposed T/L route just past angle point A82 (KP 544+100). Between angle point A82 and A83 (KP 548+000) the T/L crosses A01 Highway as it enters the village of Gerdi. At angle point A83, the COI transects the river. The environmental sensitivity is anticipated as high due to the community infrastructure and cultivated land being transected by the T/L route. The environmental impacts for this segment have been anticipated as low as ESMP mitigation measures should be implemented during the construction phase. The proposed T/L route does not conflict with any known important bird migration routes. Part D – ESMP and Part E – LARF describes mitigation measures that should be taken. See the list of known environmental agencies provided above in the National Frameworks section for assistance.

## **6.5 IMPACT ASSESSMENT**

The significance of the potential impacts from the construction and operation of the 500 HVDC T/L on the physical, biological, and social environment are identified and assessed in this section. The ESMP in Part D of this report contains a set of plans to mitigate the impacts below. With a robust ESMP in place, the potentially negative environmental and social impacts of the CASA-1000 project in Afghanistan can be comprehensively mitigated and managed.

### **6.5.1 ENVIRONMENTAL**

#### **6.5.1.1 LAND RESOURCE**

Soil erosion is a concern during construction specifically in hilly areas and near water bodies. Soil contamination may occur from spills on the ROW and at camp sites. Contaminated soils may cause long term effects on agricultural land. The potential for severe impact is high due to the seven rivers in the vicinity of the COI in Afghanistan. If the mitigation measures are implemented during the construction and operation phases, then the impacts will be minimal. Good engineering and construction practices are provided in Part D of the ESMP to mitigate these risks. These management plans provide guidance with regard to minimizing soil erosion and contamination both at the construction sites and in peripheral areas such as tower locations and along haul tracks. Special slope protection measures must be adopted on erosion prone slopes. Similarly, appropriate materials handling and blasting will reduce the chances of soil contamination and hillside landslips. Existing access roads will be used, maintained and restored wherever possible. These practices are adopted to minimize the risk of soil and water contamination especially in sensitive areas such as steep slopes, stream / river banks and agricultural areas. Following the environmental management plans provided in this document will minimize environmental risks.

#### **6.5.1.2 WATER**

Local water supplies are required for the construction of the T/L and campsites. Local communities already have acute water shortages and the potential for conflict between locals and the Contractor may be significant. As a major part of the T/L passes through hilly areas, and in the vicinity of seven rivers, this impact may be characterized as potentially high and significant.

- Use of local water sources (wells/streams/groundwater) during construction to meet the campsite and construction requirements. Already the local communities are facing acute shortage of water to meet their domestic and agricultural needs. Conflicts over water use may result between the locals and contractors. While the conflict may be of limited duration it could be significant for local people.
- Siltation of Natural Streams and Irrigation Channels by excavated material carried from construction and storage areas by runoff. The implementation of good construction practices

and the following mitigation will minimize the potential for any significant impact on natural streams and irrigation channels.

- Spillage of chemicals, fuels, solvents, oils, paints and other construction materials such as concrete may contaminate surface and underground waters.

The following measures are provided in Part D, ESMP that provide the proponent with guidelines on how to mitigate the project's potential impacts on local community water resources:

- In areas where potable water is in short supply and critical, the availability of water will be assessed and alternate sources developed for construction purposes if necessary;
- Camps will be located at least 500 m away from the nearest local settlements and any streams to prevent the contamination of community-owned water resources;
- Approval from the local administration will be obtained before using local water resources;
- Contractors will be required to maintain close liaison with local communities to ensure that any potential conflicts relating to resource utilization are avoided if possible and resolved quickly in the event they occur. Commonly applied good management practices will be adopted to ensure that fuels and chemicals, raw sewage and waste water effluent are disposed off in a controlled manner to eliminate the risk of contamination. The following measures will be taken to mitigate adverse impacts.
  - Construction camps will not discharge waste of any type into any intermittent or perennial stream; All wastes from construction areas and activities will be treated and managed so as not to have any effect on local soils, surface or ground water.
  - Excavated earth material for tower foundations will be managed properly ensuring that it will not impede or cause siltation of intermittent or perennial streams.
  - Excavated materials and slopes will be protected to eliminate the possibility of erosion that may cause siltation of natural streams.

### 6.5.1.3 NOISE AND AIR QUALITY

Ambient Air Quality will be affected by dust and emissions from construction machinery, and vehicular traffic during the construction phase. Dust and emissions may be carried over long distances, depending on wind speed and direction, humidity and atmospheric stability. The major sources of air pollution during the construction phase are quarry areas that generate dust during the rock blasting and crushing, and vehicles and machinery that emit particulates and gaseous pollutants. Trucks also generate dust during loading and unloading processes.

There will be noise and vibration impacts from the construction, operation, maintenance and decommissioning of the proposed transmission line. Noise from construction activities will generally be emitted from equipment used for the construction of access tracks, clearing of vegetation, construction of supporting towers and associated facilities and rehabilitation. Noise from operation and maintenance

activities along the proposed transmission line would be from electrical conductors and equipment used for the maintenance of access tracks, and periodic inspection of the transmission line. While the route of the proposed transmission will be within a corridor that has a relatively low population density, noise generated by the construction machinery during construction will affect near-by residents to some extent.

Predicted noise levels from construction of the proposed transmission line would be carried out in a number of stages as follows:

- Profile and preconstruction survey to locate structures;
- Construction of access tracks and clearing of vegetation;
- Installation of foundations, erection of structures and stringing of conductors and Earth-wire; and
- Easement restoration and rehabilitation.

Of the above phases, the noisiest activities will be during construction. Noise during the operation and maintenance of the high voltage transmission line mainly arises from the maintenance activities. Audible noise during operation of the transmission line may result from minor electrical discharge caused by ionization of the air by high strength electric fields adjacent to conductor and hardware surfaces. This phenomenon is known as the “corona effect” and the levels of noise generated vary depending on the conductor surface and atmospheric conditions. Noise levels from the corona effect are generally not noticeable under normal weather conditions.

Impacts from noise and air quality during construction and operation will be alleviated with implementation of the following mitigation measures (guidelines are provided in detail in Part D of this report):

- Good environmental, health and safety practices will be used during rock blasting at quarry and tower locations to minimize the impact of dust and noise on local people;
- Wherever possible existing quarries will be used to borrow the aggregate materials;
- Concrete batching plants will be equipped with dust control equipment such as fabric filters or wet scrubbers to reduce the level of dust emissions;
- The relevant existing regulatory norms must be adopted as standards for emissions generated by the construction vehicles, equipment and machinery during the construction;
- The normal method of controlling dust is to spray roads with water. This would only be practical where there are a large number of residents near an unsealed access road supporting peak traffic volumes. Where dust emissions are high especially due to movement on trucks, regular sprinkling of water for dust control will be required;

- Aggregate materials are to be borrowed from existing quarries where possible, reducing the need for rock blasting thus reducing noise and dust generation;
- Haul-trucks carrying sand, aggregate and other materials will be covered to contain construction materials being transported;
- Dust from roads will be controlled with water, when necessary;
- Construction equipment and vehicles will be properly maintained to ensure emissions are compliant with the National Environmental Quality Standards (NEQS);
- Ambient air quality monitoring will be conducted as necessary along the COI in accordance with the accepted international standards;
- Ensure the proper tuning of the construction vehicles; and
- Random noise monitoring should be carried out along the COI in accordance with the accepted international standards.

#### 6.5.1.4 FLORA

Every effort must be made to avoid damage or removal of trees as they are scarce and important to the local land users. In the event trees must be removed, land users will be compensated for the loss and will be encouraged to plant new trees in appropriate locations (refer to Part E of this report for guidance with LARF). Vegetation damage will be kept to a minimum by placing camps and work areas on barren ground when at all possible. New access roads will only be built where there is no existing access. New access roads will be carefully built to ensure impact is minimal.

- Agriculture: the fertile areas near streams/rivers may experience damage to crops such as wheat, maize and fodder and farming activities will be delayed due to construction. Because of the relatively small number of trees in the COI and due to the fact that trees will only have to be cut if they are within 25 meters of the centerline it is unlikely that many trees will be affected during the construction of the T/L. The important species of trees within the COI include Mulberry, apricot and poplar. The exact number of trees that will be cut can only be determined once the location of the centerline and the towers has been fixed during the final design phase of project development. This will be done by the Construction Contractor.
- Shrubs / other vegetation: the overall impact of the T/L on shrubs and other vegetation will not be significant because of the use of temporary access roads, low density of shrubby vegetation and ephemeral nature of the perennial grasses. The degree of impact to the affected vegetation and vegetation cover can only be determined when the towers are sited during final design. In any event it will be possible to route the line and place towers to avoid the significant damage.

Country-specific guidelines are provided below:

- For agricultural losses, land holders will be paid compensation for the loss of their standing trees, in accordance with the prevailing market rates. The landholders will be allowed to salvage the wood of affected trees. They will also be encouraged to plant suitable new trees at appropriate places.
- Existing access tracks to the tower sites will be used whenever possible and new paths will be constructed only when no existing path is available.
- While making new access paths to tower sites, care will be taken to minimize the area of affected land and crops.
- The camps and workshop facilities should be established on barren land, however, if such type of land is not available, it will be ensured that minimum clearing of the vegetation occurs and minimum damage occurs to crops and trees.
- The Contractor's staff and labor will be directed not to damage any vegetation and to use only designated paths and roads.
- Contractor will provide the fuel wood/gas cylinders at the camps for cooking purposes and cutting trees/bushes for fuel will not be allowed.

#### **6.5.1.5 FAUNA**

There is no mentioned that two rare and endangered species may occur in the COI, including *Falco jugger* (Near Threatened), and *Neophron percnopterus* (Endangered). Special bird protection measures are recommended in these areas and the two IBA areas that the COI crosses. Short term construction of the T/L is not expected to have significant impacts on birds in the area.

Construction is expected to have minimal affects on small mammals and reptiles. Aquatic species in the rivers are not considered highly valuable; therefore with implementation of the mitigation measures, impact will be insignificant.

- **Mammals and Reptiles:** During the construction phase there will be some unavoidable negative effects on the small mammals and reptiles along the ROW. The magnitude of this effect will be small as the area of habitat affected will be small relative to the availability of similar habitat throughout the COI and surrounding areas. Furthermore as these mammals and reptiles are of limited ecological, economic and social value in the local context, the impact on their populations will not be significant. There are no significant habitats or species of rare, endangered or protected, wildlife in the COI and the overall impact on mammals and reptiles will not be significant.
- **Birds:** The T/L crosses two IBAS (Salang Koatal and Jalalabad Valley) in Afghanistan. Bird protection measures as identified in the ESMP will be implemented.
- Some of rivers contain fresh water fish. In general, these species are neither protected nor of high value from ecological, economic or social point of view. With the adoption of good construction practices and the mitigation measures described in the ESMP, impacts to fish and

other aquatic life during construction and operation will not be significant. The contractor will not work within 100 meters of any perennial stream or river and will take special measures to avoid any disturbance to the riparian and riverine habitats and fish.

The following mitigation measures are discussed in detail in Part D of the ESMP:

- Construction activities will be limited to the hours from dawn to dusk.
- Lights used in the construction camps will be kept to the minimum and diffuse lighting is to be preferred.
- Vehicles will be operated so as to minimize risk to wildlife.
- Special measures will be adopted to minimize impacts on wild birds, such as avoiding construction activities in breeding areas during the breeding season.
- Contractor's staff will not be permitted to shoot snare or trap birds, nor be in possession of wild animals.

### **6.5.2 SOCIO-ECONOMIC AND CULTURAL ENVIRONMENT**

The following paragraphs provide the anticipated impacts and the related measures that can be taken to mitigate the social effects that may occur during various stages of the implementation of the project. Mitigation measures are considered for each stage of the project activity and guidelines are provided in ESMP, Part D.

#### **Design Stage:**

- Settlements and social infrastructure should not be disturbed
- ROW clearance should be maximized to avoid accidents
- Use of agricultural land should be kept to a minimum

#### **Pre-Construction Stage:**

- Land owners and land administrators will be consulted to determine procedure for land acquisition and prices, and other special conditions specific to the area
- Compensation for loss of buildings and community assets should be based on replacement value and current market rates
- Compensation for loss of commercial structures should be based on current market rates
- Compensation should occur before construction activities commence
- Loss of tress must be avoided where possible. In the event tress must be removed compensation should be negotiated with owners
- A Compensation Disbursement Committee should be formed and include affected people to ensure compensation is disbursed appropriately

**Construction Stage:**

- Tower placement is preferred in the corner or border of the field in agricultural land
- Construction should commence after harvest
- The Contractor shall arrange its own groundwater extraction or utilization of surface water due to the shortage
- All investments made by the Contractor during construction (tube wells/pumps) shall be given to local residents at the end of construction
- Extra care must be taken to avoid damage to trees
- The privacy of local women is to be respected
- Local people shall be employed whenever possible
- Preference shall be given to those directly affected

**6.5.2.1 LAND ACQUISITION**

It is anticipated that permanent land acquisition will not be necessary for this project, as the land surrounding towers may be used for agriculture proposes. Land may need to be acquired to relocate homes. In the event land needs to be permanently acquired and resettlement action plans are triggered – guidance in Part E -LARF of this report are provided.

Temporary land acquisition will be necessary for the Contractors camps/work areas, aggregate quarries, and access roads. One camp will extend over approximately 2500 m<sup>3</sup>. The impact of temporary land acquisition is not expected to be significant with implementing mitigation measures outlined in Part E - LARF of this report.

**6.5.2.2 CROP AND TREE LOSS**

Tree cutting will be avoided where possible. Where tree and crop damage is unavoidable, compensation for the loss will be paid at market value and will be standard across the provinces. Additional compensation will be paid for permanent loss. The compensation process must be transparent and free of discrimination or favor. Through careful route selection and avoidance of valuable land, crop loss will be kept to a minimum following the mitigation management plans provided in Part D and Part E of this report.

**6.5.2.3 LOCAL COMMUNITIES/WORKFORCE**

Particularly sensitive communities such as tribal communities will be avoided during final tower location selection. Construction crews will receive social sensitivity training to minimize the potential for impacts on local communities (Part D -ESMP).

#### 6.5.2.4 LOSS OF INCOME

Local farmers may experience loss of income due to tower and/or access road construction. The magnitude of the losses will be estimated once the tower and access road locations have been determined and mitigation measures are provided in the ESMP.

Through judicious route selection, crop losses should be avoided. Compensation will be negotiated for all crop and tree loss and provided as per the resettlement policy framework in Part E - LARF. Preference will be given to affected people when locals are hired by the Contractor. Local residents should have the opportunity to work for the Contractor and local goods and services should be used when possible.

#### 6.5.2.5 GENDER ISSUES

Local women and children will not be allowed to access the work areas during construction. With careful route selection, impacts on routine activities should be minimal. Residents who live within 500 m of blasting sites should be notified 24 hours in advance of blasting activity. The area within 200 m of the blasting site will be evacuated a minimum of 15 minutes prior to the blast. The Contractor should coordinate with local leaders and Elders to ensure conflicts are effectively resolved. Local goods, services and workers will be employed when feasible. Women in rural areas spend a lot of time in the field and construction through these areas may cause an invasion of privacy. Local people should be consulted to ensure impacts are minimized.

Land rights are the main issue facing women today in Afghanistan. Very few women in Afghanistan own land and only some widowed women own livestock, although a major portion of their livelihood activities are involved in both. Although women's rights to land are enshrined in the Afghanistan constitution, extremely high illiteracy rates and restrictions on women working outside their villages act as obstacles to women exercising their rights to land.

According to recent reports<sup>41</sup>: the available casualty data related to mine and ERW in the Afghan national mine action database (1979 to 2010) shows the status of casualties from the gender and activities perspective as follows:

- a) During food, water and wood collection there were 244 females, and 2,130 males either injured or killed, working out as about ten per cent female versus 90 per cent male
- b) While farming, there were 55 female casualties and 1, 526 male casualties, working out as about 3.5 per cent female versus 96.5 per cent male
- c) During household related activities, 63 women and 109 men were injured, equaling to 37 per cent female versus 63 per cent male injuries

<sup>41</sup> Rashid, Mohammad Sediq, Jan, Mullah, & Wakil, Mohammad. 2010. "Landmines and Land Rights in Afghanistan". *Geneva International Centre for Humanitarian Demining*: 1-19.

- d) 153 females and 3, 280 males were injured tending animals, or four per cent versus 89 per cent
- e) While travelling, 331 women and 2, 648 males were hurt, or 11 per cent versus 89 per cent<sup>42</sup>

Every effort should be made to ensure the privacy and the empowerment of local women. Specific concerns should be discussed with the appropriate tribal Elders. Measures for Land Mines are presented in Appendix 8 of the ESMP.

#### **6.5.2.6 VULNERABLE POPULATIONS**

Mining contamination has attributed to a severe loss of livelihood and livestock, restricted access to land and exacerbated food insecurity<sup>43</sup>. There is a severe lack of access for people in Afghanistan to proper shelter, potable water and sanitation exacerbating health and hygiene problems resulting in extreme hardship for all sectors of the population. Mental health problems in particular are a major issue increasing domestic violence rates and other physical and intellectual health problems.

Approximately one-third of the residents within the proposed transmission line route live below the poverty line and are considered “vulnerable”. In Afghanistan an estimated 161 sq km of agricultural land is contaminated by mines. A majority of the mines are in pastoral land<sup>44</sup>. Inequalities based on land related rights based on ethnicity, language and tribal origin is another devastating feature of the socio-political climate there. Minority and vulnerable populations have been forced off of their land and forced to settle elsewhere. Land related problems are attributed to the way the land was unfairly distributed in the past<sup>45</sup>. The Land Acquisition and Resettlement Framework in Part E addresses the magnitude of impacts and which mitigation measures could be implemented.

If impacts are unavoidable by changing the T/L route or tower location, relocation and compensation guidelines are outlined in the LARF (Part E).

#### **6.5.2.7 HEALTH AND SAFETY**

Construction workers may be exposed to minor nuisances from noise to serious health and privacy concerns. The land mines along the COI route that are still undetected are a major concern and the appropriate agencies and institutions responsible for identifying mine areas are provided in the beginning of this section in the national and legal framework section. To ensure the health and safety of construction workers and local residents, the following mitigation measures will be implemented and guidelines are provided towards this end in Part D - ESMP:

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<sup>42</sup> Ibid

<sup>43</sup> Ibid

<sup>44</sup> Ibid

<sup>45</sup> Ibid

- All construction workers must be provided with clean food, water and sanitation facilities during their employment for the project;
- Workers are to be trained in first aid, and first aid stations are to be easily accessed;
- Workers will be tested for HIV, Hepatitis A, B and C prior to hiring;
- Workers must receive training in construction safety, health and environmental awareness;
- All workers will be provided with personal protective equipment (safety boots, helmets, gloves, masks, etc);
- Compliance with International Labor Organization (ILO) Convention No. 62 is mandatory;
- The Contractor is responsible for development of Safe Work Practices for workers;
- Compliance is to be monitored through safety inspections/audits of the work site and equipment; and
- The Contractor is responsible to ensure safety of the public.

#### 6.5.2.8 PROJECT AFFECTED PERSONS

The political turmoil in Afghanistan (as a result of 25 years of ongoing civil war and foreign invasion including an era of virtual lawlessness and frequently changing regimes) has had serious impacts on the people and the land<sup>46</sup>. Land grabbing in Afghanistan is common and official land registries have been described as unreliable in this civil war context. This will impact the length of time involved in negotiating land acquisition and resettlement action planning. Lacking any specific knowledge about local contexts (lacking household and community data) project proponents must move forward acknowledging that their presence in these economically and socially devastated urban and rural areas is intense.

There are few legal livelihoods available to the people. Poppy production and trade at the Afghanistan and Pakistan border may pose security risks if the proper prior informal and formal communication channels have not been established. Part E - LARF of this report provides some guidance about consultation towards creating a spirit of cooperation with potentially project-affected communities. Land mines, NATO forces, illicit drug activity and a strained and impoverished citizenry sum up the socio-political climate in the Col areas. Particularly sensitive communities, such as tribal communities, should be avoided during final tower location selection. Construction crews will receive social sensitivity

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<sup>46</sup> Eggerman, Mark & Panter-Brick, Catherine. 2010. "Suffering, hope, and entrapment: Resilience and cultural values in Afghanistan". *Social Science & Medicine* 71: 71:83.

Goodson, Larry & Johnson, Thomas. 2011. Parallels with the Past – How Soviet Lost in Afghanistan, How the Americans are Losing. *Orbis* 658: 1-23.

Rashid, Mohammad Sediq, Jan, Mullah, & Wakil, Mohammad. 2010. "Landmines and Land Rights in Afghanistan". *Geneva International Centre for Humanitarian Demining*: 1-19.

training to minimize the potential for impacts on local communities. Provisions for camps and minimizing community disturbance are presented in Part D - ESMP.

#### **6.5.2.9 RELCOATION OF PUBLIC INFRASTRUCTURE**

The transmission line will be routed to avoid cultural, historical, religious structures, schools or public buildings. Although unlikely, in the event existing electric poles have to be moved for construction of the T/L the impacts and mitigation measures are provided in Part E: LARF of this report for the method of valuation and protocols involved in the relocation of public infrastructure.

## 7. ESIA - PAKISTAN

### 7.1 BACKGROUND TO THE PAKISTAN ESIA

The following presents an environmental and social assessment of the CASA 1000 Project in Pakistan. Information has been sourced from previous environmental and social assessments completed by SNC Lavalin (2009c, 2009d) and complemented by newly acquired 6 m satellite imagery for the 71 km portion of the 500 HVDC cross-border T/L project in Pakistan.

### 7.2 NATIONAL LAWS AND LEGISLATION

Comprehensive legislation on the environment, in the form of an act of parliament is relatively new in Pakistan<sup>47</sup>. For instance, Pakistan's National Resettlement Ordinance (NRO) (2002), specifies that lacking legal title will not be a bar to compensation entitlement where in the LAA (1894) it is not specified as either. In FATA regions, the LAA (1894) or any other Government of Pakistan law does not apply. Normally land acquisition for development projects is through consultation with the Political Agents, Malik and Tribal Elders<sup>48</sup>. The NRO ultimately is meant to complement the LAA when it comes to communal property rights and meaningful consultation between the project proponent and the project affected<sup>49</sup>.

The proposed transmission line in Pakistan falls entirely within the FATA regions. With recent amendments to the Frontier Crimes Regulations in August 2011, it is not known how it will affect tribal autonomy apart from the approval by tribal stakeholders to allow the presence of political parties to campaign in these areas<sup>50</sup>. It is reasonable to assume that respecting local customs and traditions will still be the norm when negotiating land acquisition. The new amendment brings with it redress for grievances outside of customary rule for FATA vulnerable populations (women, children and the elderly)<sup>51</sup>. The laws of which political agents should frame their communications and negotiations with tribal leaders relevant to this project are briefly reviewed below.

The key institutions responsible for the establishment and implementation of environmental policy in Pakistan are:

<sup>47</sup> MEPCO 6<sup>th</sup> STG and ELR Project (2006-07) Resettlement Plan.

<sup>48</sup> Federally Administered Tribal Areas website. URL: [http://fata.gov.pk/index.php?option=com\\_content&view=article&id=53&Itemid=87](http://fata.gov.pk/index.php?option=com_content&view=article&id=53&Itemid=87)

<sup>49</sup> Government of Pakistan, 2002 National Resettlement Policy, Ministry of Environment, Local Government & Rural Development (Pakistan Environmental Protection Agency).

<sup>50</sup> Government of Pakistan, August 12, 2011, "Political activities allowed in Tribal Areas, FCR reformed" found in URL <http://www.presidentofpakistan.gov.pk/index.php?lang=en&opc=3&sel=3&id=549>

<sup>51</sup> Ibid

- Malik and Jira Village-level governments
- Ministry of Environment
- Provincially Administered Tribal Areas Department of NWFP
- Department of Agriculture, University of Peshawar
- NWFP Wild Life Department
- NWFD Forest Department
- Khyber Forest Division
- National Highway Authority
- Irrigation and Power Department
- Environmental Protection Agency, Peshawar
- GOP Political Agency

The following statutes are relevant to this Project in Pakistan:

**Table C7-2: Pakistan –Relevant Legislation**

Legislation	Year Passed (amended)	Purpose/Content
Pakistan Environmental Protection Act	1997	This Act is the basic legislative tool empowering the government to frame regulations for the protection of the environment.
Pakistan Environmental Protection Agency Review of IEE and EIA Regulations	2000	The Pakistan Environmental Protection Agency Review of IEE and EIA Regulations 2000 (the 'Regulations'), developed by the Pakistan EPA under the powers conferred upon it by the Act, provide the necessary details on preparation, submission and review of the initial environmental examination (IEE) and the EIA. Categorization of projects for IEE and EIA is one of the main components of the Regulations. Projects have been classified on the basis of expected degree of adverse environmental impacts. Project types listed in Schedule I are designated as potentially less damaging to the environment, and those listed in Schedule II as having potentially serious adverse effects. Schedule I projects require an IEE to be conducted, provided they are not located in environmentally sensitive areas. For Schedule II projects, conducting an EIA is

Legislation	Year Passed (amended)	Purpose/Content
		necessary.
Land Acquisition Act	1894	The Land Acquisition Act (LAA) of 1894 amended from time to time has been the de-facto policy governing land acquisition for public purposes in the country. The LAA is the most commonly used law for acquisition of land and other properties for development projects. It comprises of 55 sections pertaining to area notifications and surveys, acquisition, compensation and apportionment awards and dispute resolution, penalties and exemptions.
National Resettlement Policy and Ordinance	2002	The Ministry of Environment, Local Government and Rural Development formulated a draft policy in 2004 on involuntary resettlement with technical assistance from the ADB. The policy aims to compensate for the loss of income to those who suffer loss of communal property including common assets, productive assets, structures, other fixed assets, income and employment, loss of community networks and services, pasture, water rights, public infrastructure like mosques, shrines, schools and graveyards.
Provincial Local Government Ordinances	2001	These ordinances were issued under the devolution process and define the roles of the district governments. These ordinances also address land use, conversation of natural vegetation, air, water and land pollution, disposal of solid waste and wastewater effluents, as well as matters relating to public health.
The Telegraphy Act	1910	This law was enacted to define the authority and responsibility of the Telegraph authority. The law covers, among activities, installation and maintenance of telegraph lines and posts (poles). The Act defines the mechanism to determine and make payment of compensation associated with the installation of these lines and posts. Under this Act, the land required for the poles is not acquired (or purchased) from the owner, nor the title of the land transferred. Compensation is paid to the owner for any structure, crop or tree that exists on the land; cost of the land is not paid to the owner because at the tower footing the landowner is allowed to continue to use the area. This law is not applicable in FATA areas.

Legislation	Year Passed (amended)	Purpose/Content
Antiquities Act	1975	The Antiquities Act of 1975 ensures the protection of cultural resources in Pakistan. The Act is designed to protect 'antiquities' from destruction, theft, negligence, unlawful excavation, trade and export.
Factories Act	1934	The clauses relevant to this project are in relation to health, welfare and safety aspects of the workers, disposal of solid waste and effluents, and damage to private and public property. The Act also provides regulations for handling and disposing toxic and hazardous substances. The Pakistan Environmental Protection Act of 1997 (discussed above), supersedes parts of this Act pertaining to environment and environmental degradation.
Employment of Child Act	1991	Article 11(3) of the Constitution of Pakistan prohibits employment of children below the age of 14 years in any factory, mines or any other hazardous employment. In accordance with this Article, disallows child labor in the country. The ECA states that no child shall be employed or permitted to work in any occupation set for in the ECA (such as transport sector, railways, construction, and ports) or in any workshop wherein any of the processes defined in the Act is carried out. The processes defined in the Act include carpet weaving, bidi (kind of cigarette) making, cement manufacturing, textile, construction and others.
Frontier Crimes Regulations	1901 (amended 2011)	Tribal Areas, namely the Agencies of Mohmand, Kurram, Khyber, Bajaur, Orakzai, North Waziristan, South Waziristan, and the adjoining areas of Kohat, Peshawar, Bannu, Lakki, Tank and Dera Ismail Khan Districts are declared as Federally Administered Tribal Areas and liable to Frontier Crimes Regulations.
Pakistan: Punjab Jinnah Abadis for Non-proprietors in Rural Areas Act	1986	The rights of the title-less are addressed under this Act which recognizes the rights of squatters to receive rehabilitation in the form of a replacement plot. Notably this right has been extended in some projects to include some form of rehabilitation in cash or in forms different from land. Projects such as Chotiari Dam, Ghazi Barotha Hydropower, and National Highways Improvement have awarded compensation and assistance to unregistered tenants and other forms of affected persons i.e. sharecroppers and squatters.

Legislation	Year Passed (amended)	Purpose/Content
Electricity Act	1910	This Act outlines the application and licensing processes and institutions involved in supplying and distributing energy anywhere in Pakistan.
The Cutting of Trees (Prohibition) Act	1992	This Act provides for the prohibition of cutting of trees near the external frontiers of Pakistan.
The NWFP Fisheries Act/Rules	1976	Stipulating the laws and processes governing licensing and application to fishing in the NWFP region.
The NWFP Wildlife (Protection, Preservation, Conservation and Management) Act	1975	Stipulating laws and processes governing the rules around hunting in the NWFP region.
Pakistan Penal Code	1860	This Code deals with offences where public or private property and/or human lives are affected due to the intentional or accidental misconduct of an individual or group.
The Convention of Conservation of Migratory Species of Wild Animals	1979	This Convention specifies the definitions with regard to the conservation of migratory species of wild animals.
The West Pakistan Water and Power Act	1958	This Act empowers governments to provide the framework for legal and political processes involved over: 1) water, power houses and grids; 2) the authority to have powers and obligations of license under Act IX of 1910; 3) powers regarding certain related matters; 4) right of entry; 5) sanction of government; and 6) the arrangements with local body or other agency.
The Rio Declaration	1992	The government's endorsement of this Declaration proclaims that development in Pakistan should acknowledge the "interdependent nature of the Earth and our home" and steps and processes are made towards this end through a coordinated transnational effort.

### 7.3 ENVIRONMENTAL AND SOCIAL SETTING

The baseline environmental and social information for the 500 KVDC line in Pakistan was collected in the field during the months of October, November and December 2007 (ISIA SNC February 2009). Satellite images were used to study the general area and route. A relatively detailed field reconnaissance was

conducted within the 71 km × 100 m wide COI between Torkham, at the border of Afghanistan, and Peshwar. The information collected pertained to the physical, biological and ecological elements that were not visible on the satellite images.

A COI of 100 m COI was adopted to identify the potential social and environmental constraints (fifty meters on either side of the proposed transmission line route). Additionally, this information has been supplemented by the acquisition and review of high-resolution satellite data referred to in this document as Alignment Sheets. A description of the individual Alignment Sheets for the 500 KVDC line can be found in section Part G.

### **7.3.1 PHYSICAL ENVIRONMENT**

The initial 15 km of route line follows the mountainous areas located to the west of the Torkham-Jamrod road and passes near the settlements of Mari Khel and Malik Rehmat Ullah Kalay. In general, the topography is mountainous along the Torkham-Jamrod road and after 55km enters into a flatter region and agricultural areas that terminates at Sheikh Muhammadi substation at Peshawar. The mountainous portion of the COI from Torkham to Peshawar lies on the southern flank of Hindu Kush Range where elevations vary in height from 800-2000 masl.

#### **Climate:**

The COI falls in the cool sub-humid climatic zone associated with 500-1000 mm of annual precipitation. There are two distinct rainy seasons in the COI: winter (December through March) and summer (June-September). There is commonly a weak monsoon in July. During April and May, October and November the weather remains dry. Winds are generally from a northerly direction in winter and from the Southwest in summer. The COI has a variable climate with cold winters and hot summers. During summer months there is great fluctuation in diurnal temperature in the open and in the shade of hilly areas. During summer, temperatures can reach 40°C but summer nights are relatively cool. In the winter at higher elevations the COI may experience snow from late December to mid February.

#### **Soil:**

The Northern two thirds of the COI have steep slopes and virtually no soil cover. The areas slopes have poor coarse textured and stony soils. Valleys contain better quality alluvial soils, mixed with gravels and pebbles deposited by storm water runoff. These are of generally coarse, moderately to strongly calcareous and well drained. The best soils occur in level to gently sloping areas and are composed of very fine sand and sandy loam derived from limestone, sand stone, shale and schist rocks. The soils in the Southern third of the T/L route are fertile and relatively good for agriculture.

#### **Geology:**

The geology of the area is suitable for transmission line construction. The COI in Pakistan runs through the Peshawar Basin and the mountainous terrain of Khyber Hills and southern extremity of the Hindu Kush Range. The rocks exposed include sedimentary, metamorphic formations ranging from

Carboniferous to Pre-Cambrian age. Among the major rock types are sandstones, siltstones, shales, phyllites, marbles, quartzites, schist's and carbonate rocks. While the COI in Pakistan traverses seismic zones 2 B and 3, most of it is in Zone 3 and is classified as having a peak Horizontal Ground Acceleration between 0.24 and 0.32g. Consequently the existing geological and seismic features within and around the COI are completely suitable for the construction of the T/L.

**Land Use:**

The majority of the COI falls within the Federally Administered Tribal Area. Most of the COI in the 50 km from Torkham to Bara is unproductive, unused, and barren. Agriculture is limited in the tribal region due to rocky soils, steep slopes, lack of suitable land and limited water supply. Scanty shrub vegetation along slopes and other areas are used as grazing and fuel wood gathering. There is relatively little agriculture in the Northern two thirds of the COI. Most of the farming occurs between Jamrud and Peshawar in the towns of Sheikh Khan, Bara and Sheikh Muhammadi, where the land is relatively good.

**Agriculture:**

The average size of the area cultivated by a family varies from 1.5 ha to 3.5 ha. In the case of communal land the area under cultivation by a single group may be from 20 ha to 40 ha. The main crops grown are wheat (61%) maize (30%) and fodder (9%). Cropping intensity reached up to 130 %. The average yield per hectare of wheat is 4,152 kg and maize 1,779 kg/ ha. For fodder it is 23,720 kg/ ha. Arable land mainly occurs in the 21 km of the COI from Bara to Sheikh Muhammadi.

**Water:**

The project area experiences two rain seasons: winter and summer. Water supply is from rainfall, snow melt, and groundwater during the dry periods.

The Bara River is the only major water course near the COI in Pakistan. During the past few years, groundwater levels have been at record low levels and the seven seasonal streams have remained dry for the majority of the year. When water is present in these streams, it is used by local residents for domestic and livestock use. Due to water shortages, dry farming is common.

**Air and Noise Quality:**

The only noise source in the area is from traffic on Torkham-Jamrod road. No air quality (AQ) sampling was done during the initial EIA and additional monitoring will be required to determine air quality.

**Biological Environment:**

In the vicinity, biodiversity in Pakistan is generally low because of the water shortage, minimal rainfall and poor soil. Vegetation is sparse due to excessive exploitation; the closest reserve forest is 10 to 15 km away. Based on consultations with government environmental agencies, local specialists on Pakistan flora, a search of the literature on endangered species in Pakistan and the results of field investigations,

there is no indication that rare, endangered or protected species of vegetation are likely to exist within the COI.

**Flora:**

There are no Ramsar or other wetlands that provide either resting or breeding habitat for any economically, ecologically or socially important species of birds or other wildlife within or in the vicinity of the COI. The vicinity of the COI is bare, rocky, precipitous and irregular. The area is sparsely vegetated minimally providing forage and firewood to the locals. Species identified in the COI that have medicinal value include: fig/injeer, mulberry, mallah/ber, bahekar, timer/khapyanga/asghandh, harmal, castor/arid, AK, bhang, grape/angoor, and ghulab/rose.

**Fauna:**

Wildlife is seldom present near the COI as there is no highly desired habitat. In consultation with local residents, the following animals have potential to be in the area: jackals, fox, cats, wild boar, wolves, porcupines, squirrels, bats, rabbits, wild hare, mongooses, mice and rats. Reptiles such as snakes, scorpions and lizards as well as flies, mosquitoes and soil dwelling arthropods are common in the area.

The greatest diversity of birds is found between Jamrod and Peshawar substation because of the local agriculture and local streams.

Rohu, mahasheer, soal, swati and carp are found in the Bara River, the only perennial water body in the area. Commercial fishing does not exist on the Bara; however, sometimes individual fishing does occur.

There are no wildlife sanctuaries, endangered species or habitats or significant wetlands within or in the vicinity of the COI.

### **7.3.2 SOCIO-CULTURAL ENVIRONMENT**

The T/L is within the jurisdiction of the Khyber Agency under Federally administered Tribal Areas (FATA). The constitutional status of FATA is outlined in the Constitution of the Islamic Republic of Pakistan (1973) and governed administratively by the Frontier Crimes Regulation (1901). Tribal people have autonomy and run their affairs according to their faith, customs and traditions.

Approximately 27 settlements are located near the COI. The majority of residents live in rural settlements with populations of 300-4000. There are five settlements that are within the COI. The settlements within the COI are: Mari Khel, Malik Rehmatulla Kalay, Phrangsang, Ali Masjid, and Surkamar.

There are four main tribes that reside along the COI: Afridi, Shinwari, Mullagori and Shalmani. The tribes have subtribes/clans that all have their own traditions and customs. The land in the COI is under two different land ownerships/ authorities. From the Torkham border to Bara the land is under tribal

ownership and from Bara to the end of the COI the land is under Government of Pakistan (GOP) administration.

Most families live as a joint/extended family system and consist of 10 to 30 residents. The literacy rate of the population studied within the COI is 37% for males and 3% for females.

The common occupations for local residents in the COI are: drivers, transporters, day laborers, working abroad and farming. The average household income for the COI is Rs. 281,400 and average expenditure is Rs. 155,000.

Approximately 44% of residents live in mud houses, 40% live in concrete/mud houses, and 16% live in concrete houses. Approximately 60% of the population had toilets with flush systems and 75% had easy access to potable water.

The water sources are generally wells along streambeds/springs and lift pumps. In areas where the wells are not close to settlements, women must travel some distance to fetch the water. More than 92% of the population has access to electricity. Health facilities, schools and paved roads are available to 50% or less of the population.

About 43% of the COI's population is female and women's privacy is a significant concern during construction due to potential invasion of privacy.

It was estimated that about 127 homes, 15 commercial structures, 7 public infrastructures and one graveyard occur within the COI. The exact amount of affected people and infrastructure cannot be determined until exact tower locations are chosen.

Methods of valuation and compensation and resettlement action plans if needed are provided in Part E - LARF of this report for guidance on mitigating these impacts.

There are six sites in the vicinity of the COI of historical, cultural and archaeological importance. Only one site, Machi Check Post is within the COI.

## **PUBLIC CONSULTATIONS**

A representative consultation process (20% sample size) was conducted with Project Affected Persons PAPs, Government representatives and local Non-Governmental Organizations (NGOs). The discussions included project planning, routing, construction and related impacts. Concerns and issues of all participants were recorded.

### **Identification of Stakeholders**

The following stakeholders were identified:

- Project Affected Persons

- Local residents (tribe elders, maliks)
- Local administration (political agent, assistant political agent, tehsil dar)
- National Transmission Dispatch Company (NTDC)/ Water and Power Development Authority (WAPDA)(Peshawar)
- Agriculture Department (Peshawar)
- Forest Department (Peshawar)
- Wildlife Department (Peshawar)
- Environmental Protection Agency (Peshawar)
- Population Census Department (Peshawar)
- Meteorological Department (Peshawar)
- NHA/FHA (Peshawar)
- Irrigation and Power Department (Peshawar)
- Local NGO - NIRE

#### **7.4 ENVIRONMENTAL AND SOCIAL ALIGNMENT SHEET DESCRIPTION**

The alignment sheets were generated based on the information available from the SNC Lavalin (ISIA February 2009) and the available satellite imagery. The total length of the HVDC transmission line in Pakistan is 71 km.

##### **AS-100**

The proposed T/L route transects community infrastructure and crosses the watercourse at angle point A84 (KP 552+500). Between angle point A84 and angle point A85 (KP 558+500) the proposed T/L route crosses a mountainous area where the land is undisturbed.

The proposed T/L route crosses the Afghanistan-Pakistan border near Torkham at an elevation of 1,250 m at KP 0+00 and enters Pakistan. The route then traverses mountainous areas, scattered vegetation and watercourses. There are no environmentally sensitive areas between the Afghanistan-Pakistan border and angle point P9 (KP 2+800). The proposed T/L route does not conflict with any known important bird migration routes.

The Khyber Pass is located approximately 1.5 km southeast of the COI. The COI in this area falls within the Khyber agency of FATA. The Torkham-Jamrod highway/Highway N5 runs parallel to the proposed route.

The environmental impacts for this segment have been anticipated as low as ESMP mitigation measures shall be implemented during the construction phase. The proposed T/L route does not conflict any known important bird migration routes. If stakeholder participation mitigation measures are triggered Part E – LARF provides guidance towards this end.

### **AS-101**

The proposed T/L route parallels highway N5 between angle points P9 and P8. The environmental sensitivity has been anticipated as medium as the terrain changes from level to moderate and moderate to steep. Machi check post is located approximately 1.25 km northeast of the COI. The Machi Check Post is considered as a cultural Heritage Site. There are communities located in the vicinity of the COI near angle point P8 at KP 6+700. The community of Landi Kotal parallels the proposed T/L route and is located 0.5 km north of the COI. Landi Kotal is a town that belongs to the Federally Administered Areas of Pakistan. It is located 1,072 m above the sea level and is the highest point on the Khyber Pass across the mountains to Peshawar. The land use type includes community infrastructure, cultivated lands, road, railway and undisturbed lands. Part D - ESMP and Part E – LARF describe mechanisms that should be followed to mitigate impacts.

Landi Kotal is also a tourist destination which is accessible by train and road. The Khyber railway line parallels the proposed T/L route between angle points P8 and P7 (KP 15+600). The environmental impacts for this segment have been anticipated as low as ESMP mitigation measures should be implemented during the construction phase. The proposed T/L route does not conflict any known important bird migration routes.

### **AS-102**

The proposed T/L route parallels the community of Landi Kotal which is located on the Khyber River. The Torkham road runs adjacent to the river. The route traverses steep and moderate terrain and crosses a railway line between angle point P7 and P6. Satellite imagery shows the presence of scattered vegetation and intermittent seasonal streams in this area.

The environmental sensitivity has been anticipated as low as the proposed T/L route does not interfere with the religious site. Ali Masjid Fort, a religious site is located approximately 0.8 km south of the COI. It is the narrowest point of the Khyber Pass at an elevation of 967m. Above the mosque, Ali Masjid Fort commands a view over this strategic sector of the pass. The valley walls bear insignias of regiments that have served here.

The environmental impacts for this segment have been anticipated as low as ESMP mitigation measures should be implemented during the construction phase. The proposed T/L route does not conflict with any known important bird migration routes.

**AS-103**

The proposed T/L route traverses Khyber River which is 0.6 km SE of angle point P6 at KP 27+400. Torkum-Jamrud road runs adjacent to the Khyber River. The major land use types include cultivated lands, undisturbed lands and community infrastructure. The route traverses the Jamrud River and the town of Jamrud 2 km SE of angle point P6. Jamrud is located at an altitude of 461 m above the sea level and is 17 km west of the city of Peshawar. It is the entrance to the Khyber Pass, part of the Hindu Kush range connecting it with Landi Kotal. The town also has road and rail linkages with the city of Peshawar. Jamrud, lying in proximity to the Khyber Pass, has remained a location on the trade route between central Asia and South Asia and is a strategic military location. Jamrud is located at an altitude of 461 m above the sea level and is 17 km west of the city of Peshawar. The environmental sensitivity has been anticipated as high as the COI enters the city of Peshawar approximately 5.4 km northwest of angle point P5 (KP 43+200) traversing community infrastructure and cultivated lands. Part D – ESMP and Part E – LARF describe mechanisms that should be followed to mitigate impacts.

The environmental impacts for this segment have been anticipated as low as ESMP mitigation measures should be implemented during the construction phase. The proposed T/L route does not conflict with any known important bird migration routes.

**AS-104**

Agricultural lands, watercourses and community infrastructure are traversed by the proposed T/L between angle points P5 and P4. Bara road and Bara River are intersected near angle point P4 at KP 52+100. The route then passes through agricultural lands and small pockets of communities between Angle points P4 and P3. The environmental sensitivity has been anticipated as high as the proposed T/L traverses cultivated lands and community infrastructure. Part D - ESMP and Part E – LARF describe mechanisms that should be followed to mitigate impacts.

The environmental impacts for this segment have been anticipated as low as ESMP mitigation measures should be implemented during the construction phase. The proposed T/L route does not conflict with any known important bird migration routes.

**AS-105**

The segment between angle point P3 and P2 is dominated by cultivated lands and communities. The proposed T/L route intersects Peshawar-Hayatabad road a kilometer southwest of angle point P2 (KP 66+800). The community of Masho Khel is located adjacent to the road. Dense cultivated lands are observed between angle points P2 and P1 (70 +500). The proposed T/L route then terminates at the existing Sheik Muhammadi substation ( KP 71+00) located in southern Peshawar 1 km north of angle point P1. The substation is connected by Highway N55 (Indus Highway) and Sarband road. The environmental sensitivity has been anticipated as high due to the presence of cultivated lands and community infrastructure in this area. Part D - ESMP and Part E – LARF describe mechanisms that should be followed to mitigate impacts during the construction phase.

The environmental impacts for this segment have been anticipated as low as ESMP mitigation measures should be implemented during the construction phase. The proposed T/L route does not conflict with any known important bird migration routes.

## **7.5 IMPACT ASSESSMENT**

The significance of the potential impacts from the construction and operation of the 500 HVDC T/L on the physical, biological, and social environment in Pakistan is identified and assessed in this section.

The ESMP framework in Part D and Part E of this report contains a set of management plans to mitigate project impacts. With a robust ESMP in place, the possible negative environmental and social impacts of the CASA-1000 project in Pakistan can be comprehensively mitigated.

### **7.5.1 ENVIRONMENTAL**

Soil erosion is a concern during construction specifically in hilly areas and near water bodies. Soil contamination may occur from spills on the RoW and at camp sites. Contaminated soils may cause long term affects on agricultural land. The potential for severe impact is low if the mitigation measures are implemented during the construction and operation phases.

Good engineering and construction practices are provided in Part D of the ESMP to mitigate these risks. These management plans provide guidance with regard to minimizing soil erosion and contamination both at the construction sites and in peripheral areas such as tower locations and along haul tracks. Special slope protection measures must be adopted on erosion prone slopes. Similarly, appropriate materials handling and blasting will reduce the chances of soil contamination and hillside landslips. Existing access roads will be used, maintained and restored wherever possible. These practices are adopted to minimize the risk of soil and water contamination especially in sensitive areas such as steep slopes, stream / river banks and agricultural areas. The regions surrounding Peshawar (KP 43+200) are particularly sensitive to soil and water contamination – mitigation measures are provided in the Alignment Sheets, Part G and the Part D - ESMP.

### **7.5.2 WATER**

Local water supplies are required for the construction of the T/L and campsites. Local communities already have acute water shortages and the potential for conflict between locals and the Contractor may be significant. The following impacts may occur:

- Siltation of Natural Streams and Irrigation Canals by excavated material carried from construction and storage areas by runoff. The implementation of good construction practices and the following mitigation will minimize the potential for any significant impact on natural streams and irrigation channels.
- Spillage of chemicals, fuels, solvents, oils, paints and other construction materials such as concrete may contaminate surface and underground waters.

The following measures are provided in Part D - ESMP that provide the proponent with guidelines on how to mitigate the project's potential impacts on local community water resources:

- In areas where potable water is in short supply and critical the availability of water will be assessed and alternate sources developed for construction if necessary;
- Camps will be located at least 500 m away from the nearest local settlements and any streams to prevent the contamination of community-owned water resources;
- Approval from the local administration will be obtained before using local water resources;
- The Contractor will be required to maintain close liaison with local communities to ensure that any potential conflicts relating to resource utilization are avoided if possible and resolved quickly in the event they occur. Commonly applied good management practices (see Part D - ESMP) will be adopted to ensure that fuels and chemicals, raw sewage and waste water effluent are disposed off in a controlled manner to eliminate the risk of contamination. Following measures need to be taken to mitigate adverse impacts;
  - Construction camps will not discharge waste of any type into any intermittent or perennial stream; All wastes from construction areas and activities will be treated and managed so as not to have any effect on local soils, surface or ground water;
  - The excavated earth material for tower foundations will be managed properly ensuring that it will not impede or cause siltation of intermittent or perennial streams; and
  - Excavated materials and slopes will be protected to eliminate the possibility of erosion that may cause siltation of natural streams.

### **7.5.3 NOISE AND AIR QUALITY**

- The Ambient Air Quality will be affected by dust and emissions from construction machinery, and vehicular traffic during the construction phase. Dust and emissions may be carried over long distances, depending on wind speed and direction, humidity and atmospheric stability. The major sources of air pollution during the construction phase are quarry areas that generate dust during rock blasting and crushing, and vehicles and machinery that emit particulates and gaseous pollutants.
- Noise and vibration impacts from the construction, operation, maintenance and decommissioning of the proposed transmission line: noise from construction activities would generally be emitted from equipment used for the construction of access tracks, clearing of vegetation, construction of supporting towers and associated facilities and rehabilitation. Noise from operation and maintenance activities along the proposed transmission line would be from electrical conductors and equipment used for the maintenance of access tracks, and periodic inspection of the transmission line. While the route of the proposed transmission will be within

a corridor that has a relatively low population density, noise generated by the construction machinery during construction will affect near-by residents to some extent.

- Predicted noise levels from construction of the proposed transmission line would be carried out in a number of stages as follows:
  - Profile and preconstruction survey to locate structures;
  - Construction of access tracks and clearing of vegetation;
  - Installation of foundations, erection of structures and stringing of conductors and Earth-wire; and
  - Easement restoration and rehabilitation.

Of the above phases, the noisiest activities will be during construction. Noise during the operation and maintenance of the high voltage transmission line mainly arises from the maintenance activities. Audible noise during operation of the transmission line may result from minor electrical discharge caused by ionization of the air by high strength electric fields adjacent to conductor and hardware surfaces. This phenomenon is known as the “corona effect” and the levels of noise generated vary depending on the conductor surface and atmospheric conditions. Noise levels from the corona effect are generally not noticeable under normal weather conditions.

Impacts from noise and air quality during construction and operation will be alleviated with implementation of the following mitigation measures (guidelines are provided in detail in Part D - ESMP of this report):

- Good environmental, health and safety practices will be used during rock blasting at quarry and tower locations to minimize the impact of dust and noise on local people;
- Concrete batching plants will be equipped with dust control equipment such as fabric filters or wet scrubbers to reduce the level of dust emissions;
- The relevant existing sanitary norms must be adopted as standards for emissions generated by the construction vehicles, equipment and machinery during the construction;
- The normal method of controlling dust is to spray roads with water. This would only be practical where there are a large number of residents near an unsealed access road supporting peak traffic volumes. Where dust emissions are high especially due to movement of trucks, regular sprinkling of water for dust control will be required;
- Aggregate materials are to be borrowed from existing quarries where possible, reducing the need for rock blasting thus reducing noise and dust generation;
- Haul-trucks carrying sand, aggregate and other materials will be covered to contain construction materials being transported;
- Construction equipment and vehicles will be properly maintained to ensure emissions are compliant with the National Environmental Quality Standards (NEQS);

- The Pakistan NEQS air emission standards will be adopted for the project;
- Noise monitoring will occur to ensure compliance with the accepted international standards;
- Ambient air quality monitoring will be conducted as necessary along the COI in accordance with the accepted international standards; and
- Random noise monitoring should be carried out along the COI in accordance with the accepted international standards.

#### **7.5.4 FLORA**

- The fertile areas between Shahkass and Shiekh and Muhammadi will experience potential impacts to crops, and farming activities may be delayed due to construction activities. In this area, very few trees are in the COI and only trees within 25 m of the centerline have to be removed, therefore the impact will be insignificant.
- In Federally Administered Tribal Areas, there are also very few trees. Overgrazing and excessive exploitation has reduced the cover to scrub forest. This vegetation is being used for fire fuel and forage, but a narrow clearing in the centerline of the T/L will have minimal impact.
- Shrubs / other vegetation: the overall impact of the T/L on shrubs and other vegetation will not be significant because of convenient relief for the temporary bulldozer roads, low density of shrubby vegetation and ephemeral nature of the perennial grasses. The degree of impact to the affected vegetation and vegetation cover will be determined when the towers are spotted during the detailed design phase of project development. In any event it will be possible to route the line and place towers to avoid the significant damage.

Every effort must be made to avoid damaging or removing trees as they are scarce and important to the local land users. In the event trees must be removed, land users will be compensated for the loss and will be encouraged to plant new trees in appropriate locations. Guidance for the method of valuation for compensating these impacts are provided in Part D – ESMP with regard to Construction Management Plans and Part E – LARF of this report. The following guidelines are provided below:

- Vegetation damage will be kept to a minimum by placing camps and work areas on barren land when at all possible. New access roads will only be built where there is no existing access. New access roads will be carefully built to ensure impact is minimal.
- Agriculture land holders will be paid compensation for the loss of their standing trees, in accordance with the prevailing market rates. The landholders will be allowed to salvage the wood of affected trees. They will also be encouraged to plant suitable new trees at appropriate places.
- Existing access tracks to the tower sites will be used whenever possible and new paths will be constructed only when no existing path is available.

- While making new access paths to tower sites, care will be taken to minimize the area of affected land and crops.
- The camps and workshop facilities should be established on barren land, however, if such type of land is not available, it will be ensured that minimum clearing of the vegetation occurs and minimum damage occurs to crops and trees.
- The Contractor's staff and labor will be directed not to damage any vegetation and to use only designated paths and roads.
- The Contractor will provide the fuel (wood/gas) cylinders at the camps for cooking purposes and cutting trees/bushes for fuel will not be allowed.

### 7.5.5 FAUNA

Due to lack of suitable habitat for birds, construction of the T/L will not have significant impacts on birds in the area. Aquatic species in the Bara River are not considered valuable; therefore with implementation of appropriate mitigation measures, impact will be insignificant. The following mitigation measures are discussed in detail in Part D - ESMP:

- Construction activities will be limited to the hours from dawn to dusk.
- Lights used in the construction camps will be kept to the minimum and diffuse lighting is to be preferred.
- Vehicles will be operated so as to minimize risk to wildlife.
- Special measures will be adopted to minimize impacts on wild birds, such as avoiding construction activities in breeding areas during the breeding season.
- Contractor's staff will not be permitted to shoot, snare or trap birds.

### 7.6 SOCIO-ECONOMIC AND CULTURAL ENVIRONMENT

The following paragraphs provide the anticipated impacts and the related measures that can be taken to mitigate the social effects that may occur during various stages of the implementation of the project. Mitigation measures are considered for each stage of the project activity.

#### Design Stage:

- The alignment of the transmission line can easily be selected in such a way that settlements in the vicinity of the proposed COI will not be affected;
- Privacy is an important matter for potentially affected people and the activities and customs of local people must be taken into account when selecting the route alignment;
- The project can easily be routed so as to affect the minimum number of trees and crops, which are important to livelihoods in the area;

- The transmission line should be routed to avoid schools and settlements; and
- Avoid shifting and maximize the distance of the T/L from existing permanent structures.

**Pre-Construction Stage:**

- Compensation will be made prior to occupation of the land by the Contractor;
- In the event structures need to be moved or demolished, compensation will be negotiated and provided prior to project implementation; and
- The same protocol will apply to crops and productive land.

**Construction Stage:**

- To avoid conflicts/disputes with local people, the project staff and contractors and their activities will be confined within clearly the demarcated construction areas;
- The Contractor will dispose of materials only within designated areas;
- A worker code of conduct will be established and enforced;
- The Project will not affect the mobility of local people;
- Noise and dust emissions during the project execution will be controlled;
- The Contractor will respect and follow local norms and traditions; and
- The Contractor will respect local women; and their privacy.

**7.6.1 LAND ACQUISITION**

It is anticipated that permanent land acquisition will not be necessary for this project, as the land surrounding the towers may be used for agricultural proposes. Land may need to be acquired to relocate homes. In the event land needs to be permanently acquired and resettlement action plans are triggered – guidance for mitigation measures are provided in Part E of this report.

Temporary land acquisition will be necessary for the Contractors camps/work areas, aggregate quarries, and access roads. One camp will extend over approximately 2500 m<sup>2</sup>. The impact of temporary land acquisition is not expected to be significant with implementing mitigation measures outlined in Part E - LARF of this report.

**7.6.2 CROP AND TREE LOSS**

The magnitude of loss will depend on the season in which construction is done and the type of crops damaged. Through careful route selection, avoidance of valuable land and following the mitigation measures, crop loss will be kept to a minimum following the mitigation management plans provided in Part D and Part E of this report.

### 7.6.3 LOCAL COMMUNITIES/WORKFORCE

Particularly sensitive communities such as tribal communities will be avoided during final tower location selection. Construction crews will receive social sensitivity training to minimize the potential for impacts on local communities.

The socio-political realities in this KPK (khyber pakhtunkhwa) region are complicated. There is currently a savage feud between the Deobandi and Barlvi sects of Sunni Islam, and Sunnis and Shias of Orakzai and Kurram agencies<sup>52</sup>. These areas have been described as an area of criminal activity, drug mafias (poppy production and trade) and militancy. There are few legal livelihood opportunities<sup>53</sup>. What is available in terms of a legal livelihood is primarily pastoral with some agricultural activity in the few fertile valleys. Agriculture is limited in most of the FATA due to the rocky soils, steep slopes, lack of suitable land and limited water. There is relatively little agriculture in the Northern two thirds of the COI. Most of the farming occurs in the southern third between Jamrud and Peshawar in the towns of Sheikh Khan, Bara and Sheikh Muhammadi where the land is relatively fertile. Notably, the Ayub Afridi Tribe has 1000-2000 acres of agriculture land from Bara Grid Station to Sheikh Muhammadi Grid Station. Poppy production and trade is reportedly present in Pakistan between the borders at the Khyber pass<sup>54</sup>.

### 7.6.4 LOSS OF INCOME

Local farmers may experience loss of income due to tower and/or access road construction. The magnitude of the losses will be estimated once the tower and access road locations have been determined and mitigation measures are provided in Part D - ESMP and Part E – LARF of this report.

Through judicious route selection, crop losses should be minimized. Compensation will be negotiated for all crop and tree loss and provided as per the resettlement policy framework. Preference will be given to affected people when locals are hired by the Contractor. Local residents will have the opportunity to work for the Contractor and local goods and services will be used when possible, therefore the effects on employment are expected to be positive.

<sup>52</sup> Ahmad, Manzoor. 2010. "Implications of the War On Terror for Khyber Pukhtunkwa, Pakistan". *Journal of Critical Globalization Studies* 3: 102-113.

Vree, Michael. "Tribal Pakistan: Who's in Control? A new general of Taliban leadership gains influence in Pakistan" *Frontline World* URL: <http://www.pbs.org/frontlineworld/stories/pakistan703/history/map.html>

BBC News. June 22<sup>nd</sup>, 2009. "Pakistan Conflict Map, Research by the BBC Urdu's service into the growing strength of Taliban militants in northwestern Pakistan shows that only 38% of the area remains under full government control". URL: [http://news.bbc.co.uk/2/hi/south\\_asia/8046577.stm](http://news.bbc.co.uk/2/hi/south_asia/8046577.stm)

*The People of Pakistan*. August 17<sup>th</sup>, 2010. "Check Indian, Afghan Dams For Floods in Pakistan". URL: <https://thepeopleofpakistan.wordpress.com/tag/khyber-pakhtunkhwa/>

Global Security.org. "Pakistan's FATA Policy" and "Kyhber Agency". URL: <http://www.globalsecurity.org/military/world/pakistan/fata-pak.htm>

IRIN, humanitarian news and analysis a service of the UN Office for the Coordination of Humanitarian Affairs. May 30<sup>th</sup>, 2011. "Pakistan: Backgrounder on Khyber Agency militancy" URL: <http://www.irinnews.org/report.aspx?reportid=92847>

<sup>53</sup> Ibid

<sup>54</sup> Ibid

### 7.6.5 GENDER ISSUES

Women in rural areas spend a lot of time in the field. Construction through these areas may cause an invasion of privacy. Every effort should be made to ensure the privacy of local women. Specific concerns will be discussed with the appropriate tribal Elders (Maliks) and guidance is provided in Part E – LARF towards this end. Traditionally the household head (elder) has the ultimate decision making power over the whole family.

The Taliban presence in these communities has made it difficult for women to seek any level of education – as under stricter forms of Sunni Islam a woman’s place is in the home. Urban areas educating women have received formal threats from these militant Sunni groups<sup>55</sup>. In rural areas threats have been more serious, resulting in violence against women. Women take an active part in agricultural activities, collect fuel wood and fetch water, in addition to attending to any domestic related duties.

### 7.6.6 VULNERABLE POPULATIONS

Many of the residents within the proposed transmission line route live below the poverty line and are considered “vulnerable”. The Land Acquisition and Resettlement Framework in Part E addresses the magnitude of impacts and which mitigation measures should be implemented.

Water and sanitation issues are of a high concern given that more recently (2011), according to the Health Department, Cholera has broken out amongst some three hundred peoples including women and children (vulnerable populations)<sup>56</sup>. A majority of people live well below the poverty line and a majority of people possess a nil to low literacy level (sample drawn: males 37% and females 3 %). The ecology of this area suggests that the areas that used to provide forage and firewood are diminishing at a fast pace, pushing people to become more reliant on other forms of livelihood (legal and illegal) that exist in the surrounding areas.

### 7.6.7 HEALTH AND SAFETY

Construction workers may be exposed to minor nuisances from noise to serious health and privacy concerns. Impacts on public health and safety will not be significant during the operational phase.

To ensure the health and safety of construction workers and local residents, the following mitigation measures will be implemented and guidelines are provided towards this end in Part D - ESMP:

- All construction workers must be provided with clean food, water and sanitation facilities during their employment for the project;

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<sup>55</sup> Ibid

<sup>56</sup> Afridi, Sudhir Ahmad. August 08, 2011. “Cholera outbreak in Khyber Agency” in the Daily Times. URL: [http://www.dailytimes.com.pk/default.asp?page=2011\08\08\story\\_8-8-2011\\_pg7\\_21](http://www.dailytimes.com.pk/default.asp?page=2011\08\08\story_8-8-2011_pg7_21)

- Workers are to be trained in first aid, and first aid stations are to be easily accessed;
- Workers will be tested for HIV, Hepatitis A, B and C prior to hiring;
- Workers must receive training in construction safety, health and environmental awareness;
- All workers will be provided with personal protective equipment (safety boots, helmets, gloves, masks, etc);
- Compliance with International Labor Organization (ILO) Convention No. 62 is mandatory;
- The Contractor is responsible for development of Safe Work Practices for workers;
- Compliance is to be monitored through safety inspections/audits of the work site and equipment; and
- The Contractor is responsible to ensure safety of the public.

### 7.6.8 PROJECT AFFECTED PERSONS

Along the COI land is held as communal property by the tribes and local clans. Communal land is managed by tribal customary laws ensuring in principle, a degree of fairness and equitable distribution. Social support mechanisms operate relatively high in these areas as community projects and developments are approached collectively when it comes to community needs such as: death and marriage ceremonies; harvesting and threshing of crops; construction of community meetings places (Hujra) mosques; building and cleaning irrigation channels; protection from floods; maintaining paths; and wood and grass cutting<sup>57</sup>.

Each tribal agency is administered by a political agent, assisted by a number of assistant political agents, tehsildars (administrative head of a tehsil) and naib tehsildars (deputy tehsildar), as well as members from various local police (khassadars) and security forces (levies, scouts). As part of his administrative functions, the political agent oversees the working of line departments and service providers. The political agent is responsible for handling inter-tribal disputes over boundaries or the use of natural resources, and for regulating the trade in natural resources with other agencies or the settled areas. The political agent plays a supervisory role for development projects and chairs an agency development sub-committee, comprising various government officials, to recommend proposals and approve development projects. This person also serves as project coordinator for rural development schemes – making this person the first person to contact in relation to the state and communications with tribal leaders<sup>58</sup>.

<sup>57</sup> Federally Administered Tribal Areas website. URL: [http://fata.gov.pk/index.php?option=com\\_content&view=article&id=53&Itemid=87](http://fata.gov.pk/index.php?option=com_content&view=article&id=53&Itemid=87)

<sup>58</sup> Federally Administered Tribal Areas website. URL: [http://fata.gov.pk/index.php?option=com\\_content&view=article&id=53&Itemid=87](http://fata.gov.pk/index.php?option=com_content&view=article&id=53&Itemid=87)

Jirga and Malki systems are strong and powerful local institutions for the reconciliation and resolution of local disputes and punishment for those who violate the local rules and customs. The reported crime rate in FATA is low. However, corruption has been reported to enter the tribal dispute resolution system. The poor and vulnerable populations cannot afford the jirga system<sup>59</sup>. The jirga requires hospitality among other things that the vulnerable and poorer populations cannot afford. Accusations have been made by the poor and vulnerable populations that the jirga's ultimate decision tends to favour the rich and influential – those whom are financially able to please the expectations of the jirga's<sup>60</sup>. A Malik has a very high status in his tribe. The Political Agent gives the Malik some amount as Mojib (allowance) periodically to run his local hospitality expenses. The local people respect Maliks whom are known to possess good personal characteristics, weapons and men at their disposal to carry out armed operations when needed and at their discretion<sup>61</sup>.

Concerns were expressed in previous consultations that the construction of the project should not enter the Sheikh Muhammad Grid Station agricultural area. Lacking any specific knowledge about local contexts (lacking household and community data) the proponents must move forward acknowledging that their presence as proponents of electricity providers comes with it some potential hostility from the local populations. Guidance for collecting household and community data are provided in Part E – LARF of this document.

Particularly sensitive communities, such as tribal communities, should be avoided during final tower location selection. Construction crews will receive social sensitivity training to minimize the potential for impacts on local communities. Provisions for camps and minimizing community disturbance are presented in Part D: ESMP.

#### **7.6.9 RELCOATION OF PUBLIC INFRASTRUCTURE**

The transmission line will be routed to avoid cultural, historical, religious structures, schools or public buildings. Although unlikely, in the event existing electric poles have to be moved for construction of the T/L the impacts and mitigation measures are provided in Part E – LARF of this report for the method of valuation and protocols involved in the relocation of public infrastructure.

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<sup>59</sup> Ibid

<sup>60</sup> Ibid

<sup>61</sup> Ibid

## 8. SUMMARY OF MAIN PROJECT IMPACTS

Within the northern 450 km corridor COI in the Kyrgyz Republic and Tajikistan the overall environmental and social impacts of the CASA 1000 Project are considered to be minimal for the following reasons:

- There are no protected areas, natural habitats or areas of important biodiversity;
- There are no identified important bird areas or migratory routes;
- There are limited settlements and little areas of agriculture;
- A large portion of the route is unsettled and not used by people; and
- No resettlement is expected in Tajikistan or the Kyrgyz Republic.

Similar conditions exist in the southern 750 km HVDC corridor, with some exceptions:

- There are no protected areas, natural habitats or areas of important biodiversity in both Tajikistan and Pakistan;
- Most of the COI in Afghanistan is arid, poorly vegetated and supports low biodiversity;
- There are no protected forests or protected areas in Afghanistan;
- There is one IBA (Imam Sahib) in Tajikistan. There are two important bird areas (IBAs) in Afghanistan (Salang Kotal and Jalalabad Valley) where special bird protection measures may have to be implemented, once the need for an avian protection plan has been established;
- Two species, the Egyptian Vulture (endangered) and Laggar Falcon (Near Threatened) are found in the Jalabad Valley IBA and rerouting through this area should be considered;
- No resettlement is expected in either Pakistan or Tajikistan however compensation for agricultural and other losses will be addressed through the implementation of the LARF/LARP.

Because of the nature of a transmission line project, which requires minimal surface disturbance, only for tower and converter station locations, impacts of the CASA 1000 Project are considered to be minimal with proper implementation of mitigation measures specified in the ESMP. Construction related impacts, relating to access roads, camps, borrow pits/quarries, tower/converter station construction are considered to be the most significant and special attention has been paid in the ESMP to address these impacts.

There are two impacts of the CASA 1000 project that deserve special attention.

- In Afghanistan, worker and community safety issues relate to the proliferation of mines and unexploded ordnance. Special measures are presented in the ESMP (Annex 8) to address these issues;
- Although the transmission line crosses two important bird areas (IBA) in Afghanistan, the potential for conflicts with migratory species can be avoided through the implementation of avian protection plans or selective line reroutes. More details are provided in the ESMP, Aesthetics and Ecological Management Plan.



## 9. GAP ANALYSIS

At this Feasibility Stage there remain gaps between the information collected and analysed for CASA 1000 project and what is needed to ensure a successful project implementation. During implementation of the ESMP and prior to the construction phase, additional data needs to be considered for the CASA 1000 project and incorporated into final plans. The information required follows:

### 9.1 POLICY AND ADMINISTRATIVE FRAMEWORK

- Specific Kyrgyz Republic environmental legislation and policy framework has been described but specific confirmation is required as follows:
  - Environmental regulatory documents to determine if the documents comply with Bank policies;
  - Indication of what licenses are required to obtain construction permit; and
  - Details on how the local authorities enforce legislation.

### 9.2 PROJECT DESCRIPTION

- Clear overall CASA 1000 project development framework and direct interactions with the country specific energy context;
- Improved information on the social and environmental aspects of the HVDC Converter Stations. They are normally largely staffed during operation and require more resources such as water, sewage, spill containment etc.

### 9.3 ENVIRONMENTAL BASELINE CONDITION

- The following environmental baseline information is recommended as part of ESMP implementation:
  - A final centre line survey should be completed to confirm the environmental alignment sheets;
  - The potential for invasive plant species propagating on the RoW needs to be considered, as well as what types of invasive species are present;
  - A field survey of individual campsite locations are needed to determine alternate sources if needed. Data is needed on groundwater in the locations in the event it is chosen as the preferred potable water source;
  - Construction plans for access and maintenance roads, including dimensions and long term erosion control measures;
  - Specific details needed on the water monitoring plan, specifically for the rivers used by local communities,

- Confirmation of vegetation burning needed; and
- Data needed for estimates of GHG emissions from both vegetation clearing (burning) and construction machinery data.

#### **9.4 SOCIAL BASELINE CONDITION**

- Prior to construction, a centre line survey of the T/L in the Kyrgyz Republic should be completed to equate the social baseline conditions with Tajikistan, Afghanistan and Pakistan;
- Information on whether local residents will be employed after construction (i.e. maintenance crews);
- Information on whether or not (and how) the population influx will affect local residents after construction is complete (may depend if the maintenance crews are local residents or not);
- Details on how the project may affect jobs (losses and creation);
- Information is needed on how the construction of the T/L may directly or indirectly effect economic activities;
- Details are needed on how the project will enhance the local communities and who the potential beneficiaries are; and
- Information is needed to confirm the absence of archaeological or historical significance.

#### **9.5 PUBLIC CONSULTATIONS**

- A detailed consultation phase needs to be held with local residents and other agencies, organizations and representatives of local authorities within the proposed T/L corridor;
- Feedback from these consultations must be reviewed and considered prior to completion of final management plans; and
- Part F of this document provides specific guidance on how the consultation phase of the CASA 1000 project should be implemented.

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## PART D: ESMP

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## **1. ESMP - EXECUTIVE SUMMARY**

The Environmental and Social Management Plan (ESMP) for the CASA-1000 transmission line project identifies the principles, approach, procedures and methods that will be used to control and minimize the environmental and social impacts of all construction activities. It is intended to complement the Project Initial Environmental and Social impact Assessments (ESIA), environmental alignment sheets, the Land Acquisition Resettlement Framework (LARF) and the Consultation Guidance Plan.

### **1.1 PROJECT EFFECTS**

The project's main environmental and social issues are related to the transmission line impacts on wildlife, birds, fish and fisheries, air quality; land acquisition; soil erosion, the impact of construction worker camp over the construction period; the impacts of auxiliary project components, including borrow pits; and indirect impacts on the areas' natural resources, wetlands and biodiversity. Minimal environmental impacts are anticipated as a result of construction and operation of the CASA Project and the transmission line corridor does not cross any protected areas or areas of important biodiversity and ecological value. Project environmental concerns can be effectively managed and mitigated through the proper implementation of measures identified in this ESMP.

Similarly project social impacts are also considered to be minimal. While some resettlement will occur, it is expected to affect a low number of households. A Land Acquisition and Resettlement Framework (LARF) is presented in this report as a guide for future development of a Land Acquisition and Resettlement Plan (LARP) once final route selection has been made. Other management plans as presented in the ESMP Annexes address mitigation of other social and community impacts.

### **1.2 HOW IS THE ESMP ORGANIZED AND STRUCTURED?**

The ESMP involves multiple layers and responsibilities shared between Project Management Unit (PMU), the Project Environmental Officer (PEO) the Construction Supervision Engineer (CSE), the Construction Contractor, the Independent Environmental Monitoring Consultant (IEMC) and local authorities.

The ESMP provides a framework approach to future develop of specific ESMP plans and sub-plans by the Construction Contractor and other ESMP organizations. A key component of project performance is to include specific aspects of this ESMP as indicated in the ESMP Annexes into construction contract provisions. Initial start-up costs of the EMP costs are estimated at US \$675,000.

## ESMP PLANS

**Construction Impact Management Plan** – measures to minimize negative impacts of construction activities on local communities and natural environment, to reduce the induced impacts of camp workers, to prevent pollution and ensure that hazardous materials are stored properly without risk to the environment;

**Workforce and Site Installation Management Plan** – measures to ensure that the installation of construction camps and activities of construction workers do not result in environmental impacts or disturbances to nearby communities and their residents. Includes measures to enforce a worker code of conduct and that all workers comply with the ESMP.

**Site Preparation and Restoration Management Plan** – measures to ensure that construction related clearing and other disturbance is minimized and that temporary and permanent disturbances are restored to pre-existing conditions.

**Waste Management Plan** – measures to ensure that project related solid and liquid wastes, particularly sanitary wastes, are properly treated and disposed of to the natural environment with no or minimal impact.

**Pollution Prevention Plan** – measures to ensure that the storage of fuels, chemicals, hazardous materials and other construction equipment and supplies do not leak, or cause discharges to the environment.

**Aesthetics and Ecological Management Plan** – measures to ensure that final route selection of the RoW minimizes visual impacts and aesthetics, and that construction of the CASA-1000 project does not cause lasting harm to the natural environment, its flora and fauna, protected areas and reserves and other sites of high ecological importance.

**Safety Management Plan** – measures to ensure that the safety of workers and adjacent local communities is maintained and that an injury free workplace is upheld.

**Physical Cultural Property – Chance Finds Management Plan** – measures to ensure that “chance finds”, or accidental discoveries of cultural property and historical resources, are protected and preserved without loss.

**Community Relations and Health Management Plan** – measures to ensure a dialogue with communities along the CASA 1000 Project RoW and that an effective mechanism is in place to compensate project related losses.

**Environmental and Social Supervision** – measures for supervision of project construction to ensure compliance of the construction contractor with EMP provisions and CASAREM country’s requirements.

**Environmental Monitoring Plan** – measures to continue baseline monitoring, assess the effectiveness of project mitigation and to review environmental and social performance.

**ESMP PLANS (cont)**

**Training and Capacity Building** – measures for assessing current capacity and plans for capacity building, quality assurance and quality management, review and implementation across all levels of ESMP organization.

**Reporting** – measures for reporting and communication procedures to ensure that ESMP provisions are communicated and reported at all levels of the project, including local communities.

**Implementation, Revision and Update** - The ESMP shall be considered a controlled document and should be updated annually, following a reportable incident or plan update. A key aspect of the ESMP is adaptive management where continual improvement in environmental and social performance of the ESMP occurs in response to change and lessons learned from project implementation.



## 2. ESMP CONTEXT

The Environmental and Social Management Plan (ESMP) for the CASA-1000 transmission line project (the “Project”) identifies the principles, approaches, procedures and methods that will be used to control and minimize environmental and social impacts of construction activities. It is intended to complement each of the four Project Preliminary Environmental and Social Impact Assessments (ESIA) conducted in each CASAREM country.<sup>62</sup> The ESMP is also a companion document to the Land Acquisition and Resettlement Framework (LARF) and the Consultation Guidance Plan.

This generic ESMP is to be used to develop country-specific ESMPs for each of the four CASAREM countries. The intent of the ESMP is to ensure the following:

- Provide contractor specifications to minimize environmental and social impacts of project construction;
- Provide environmental and social provisions and standards to be included in construction bid documents;
- Apply consistent environmental and social standards across all four CASAREM countries, consistent with international lender environmental and social standards and best practice;
- Identify specific roles and responsibilities for environmental and social management and establish multiple layers of responsibility for implementation;
- Develop, promote and foster a shared sense of responsibility for environmental and social management of the project;
- Promote environmental awareness and understanding among employees and contractors through training, identification of roles and responsibilities towards environmental and social management and linking project performance to overall environmental and social performance;
- Encourage an understanding of social and cultural sensitivities in local communities and the importance of minimizing project impacts on local lifestyles and culture;
- Monitor environmental and social performance throughout the project and implement an adaptive management approach to continuous improvement;
- Work with local communities and project affected stakeholders to ensure that they benefit as a result of project development; and
- Maintain an ongoing commitment to informing, engaging and involving local stakeholders throughout all phases of the project.

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<sup>62</sup> The four CASAREM countries are the Kyrgyz Republic, Tajikistan, Afghanistan and Pakistan

## 2.1 HOW THE ESMP IS STRUCTURED AND ORGANIZED

This ESMP is designed as an overriding document in a hierarchy of control sub-plans, and sets out the overarching framework of environmental and social management principles that will be applied to contractual aspects of the Project. It is directly related to the four Environmental and Social Impact Assessments (ESIA) for the CASA 1000 Project and their associated environmental alignment sheets.

The ESMP contains guiding principles and procedures for communication, reporting, training, monitoring and plan review to which all Project personnel, contractors and subcontractors are required to comply with throughout the preconstruction and construction phases of the Project. An operation phase ESMP will be subsequently developed by the Project Executing Agency, once the project has been constructed.

The ESMP should be also be considered as an overall framework document that establishes the terms of reference for all project environmental and social sub-plans that will completed including the following.<sup>63</sup>

- Workforce and Site Installation Management Plan
- Site Preparation and Restoration Management Plan
- Construction Impact Management Plan
- Waste Management Plan
- Pollution Prevention Plan
- Aesthetics and Ecological Management Plan
- Safety Management Plan
- Physical Cultural Property – Chance Finds Management Plan
- Community Relations and Health Management Plan

In addition to these sub-plans, the Construction Supervision Engineer (CSE) will develop a Construction Supervision plan and the Independent Environmental Monitoring Consultant (IEMC) will develop a Construction Monitoring Plan.

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<sup>63</sup> The framework for these plans are presented in the annexes to this document.

The ESMP is structured as follows:

- Key environmental and social impacts as identified from the project ESIA's and best mitigation and management practices are presented in Section 3.
- A summary of plan contents and individual sub-plans is provided in Section 4.
- Roles and responsibilities for environmental and social management are described in Section 5.
- A framework for Environmental Supervision is presented in Section 6.
- A framework for Environmental Monitoring is presented in Section 7.
- Communication and reporting procedures are described in Section 8.
- Training and capacity building requirements are discussed in Section 9.
- Plan monitoring and review procedures are presented in Section 10.
- EMP Implementation is outlined in Section 11.
- Preliminary EMP costs are estimated in Section 12.

#### ESMP ANNEXES

- The Annexes provide important details of the various plans of the ESMP. Readers are encouraged to refer to them as they contain important information not present in the body of the ESMP
- Annex 1 contains general specifications for the various sub-plans;
- Annex 2 contains the Workforce and Site Installation Management Plan;
- Annex 3 contains the Site Preparation and Restoration Management Plan;
- Annex 4 contains the Construction Impact Management Plan Bid Specifications;
- Annex 5 contains the Waste Management Plan Bid Specifications;
- Annex 6 contains the Pollution Prevention Management Plan Bid Specifications;
- Annex 7 contains the Aesthetics and Ecological Management Plan Bid Specifications;
- Annex 8 contains the Safety Management Plan Bid Specifications, including specifications for land mine clearance and safety;
- Annex 9 contains the Physical Cultural Property – Chance Find Procedures Plan Bid Specifications;
- Annex 10 contains the Community Relations and Health Management Plan Bid Specifications to be included in Contractor Documents; and
- Annex 11 contains Transmission Line Design Considerations.



### 3. KEY ENVIRONMENTAL IMPACTS AND MITIGATION

The four initial ESIA's completed for each of the four CASAREM countries include a detailed analysis of anticipated project impacts. For the purpose of the ESMP, impacts have been summarized for the construction phase with their key mitigation measures below in Table D3-3.

Environmental and social impacts of the CASA 1000 Project are expected to be minimal and can be effectively mitigated through implementation of measures contained in this ESMP. For each potential impact presented in Table D3-3, the relevant plan is indicated and detailed information on plan content is provided in the Annexes to this ESMP.

Impacts and their associated mitigation measures are organized as follows:

- Environmental aspect – an element of an organization's activities, products or services that can interact with the environment – can be direct or indirect;
- Impact – the effect of an environmental aspect on an environmental or social receptor;
- Mitigation Objective/Standard – the CASA-1000 Project objective of the result of mitigation;
- Mitigation – the proposed activity to reduce or minimize a project impact; and
- Relevant Plan – the link to the proposed mitigation and proposed mitigation specification to be included in contract bid specifications.

**Table D3-3: Summary of Key Environmental Construction Phase Impacts**

Environmental Aspect	Impact	Mitigation Objective/Standard	Project Mitigation Measures	Relevant Plan
Noise and Vibration Creation	Local residents  Livestock  Wildlife	To keep noise and vibration from disturbing local residents and breeding livestock and wildlife	Activities to be limited to daylight hours wherever possible  If activities must occur at night, residents must be informed and activities will be approved by local authorities  Vehicles and equipment maintenance is to occur regularly	Construction Impact Management Plan

Environmental Aspect	Impact	Mitigation Objective/Standard	Project Mitigation Measures	Relevant Plan
Dust Creation	Local residents  Construction workers	Dust levels created must not impact the health of construction workers, local villagers and surrounding environment	Access roads and work area will be watered when necessary  Construction equipment and vehicles will be restricted to designated roads	Construction Impact Management Plan
Changes in Land Use	Loss of agricultural and/or urban areas  Loss of income	To confine construction activities to designated areas to ensure minimal disturbance  To ensure no long term impacts	Avoid access clearing  Avoid agricultural land wherever possible  Restore all temporary construction disturbance  Compensation and possible resettlement	Site Preparation and Restoration Management Plan  Resettlement and Land Acquisition Frameworks <sup>64</sup>
Increased Road Traffic	Increased dust  Increased noise and vibration  Deterioration of roads	Refer to "Dust" above  Refer to "Noise" above  To minimize road damage	Road maintenance is to occur as necessary	Construction Impact Management Plan
Accidents and Unplanned Events	Increase in injury potential	The minimize health and safety risks to all employees and local residents	Safety training and monitoring will be provided  The Contractor will provide proper tools for the job and protective equipment to the employees  Vehicles and equipment will be properly maintained and inspected regularly	Safety Management Plan  Construction Impact Management Plan

<sup>64</sup> Not part of this ESMP

Environmental Aspect	Impact	Mitigation Objective/Standard	Project Mitigation Measures	Relevant Plan
Construction Equipment Maintenance	Soil, water and vegetation  Air quality	To minimize impact to the adjacent environment  To maintain air quality standards	Construction vehicles and equipment will be regularly maintained to prevent spills, leaks, and excess emissions	Pollution Prevention Plan
Waste Management	Soil, water and vegetation	To minimize impact to the adjacent environment	Hazardous materials will be contained appropriately.  Spills will be cleaned up immediately as to minimize impact on soil, water or vegetation  Waste is to be collected and disposed of at appropriate locations  Recycle waste if possible	Pollution Prevention Plan  Waste Management Plan
Alteration of Archaeological / Cultural / Historical Sites	Loss of historical/cultural resources	To minimize destruction of new and known sites during construction activities	Follow “Chance Find Procedures”  Consult local residents and authorities about historical sites	Physical Cultural Property – Chance Finds Management Plan
Increased Work Force	Potential job creation for local residents	To ensure equal employment opportunities	Income and employment conditions must be agreed to by the Contractor and local workers	Resettlement and Land Acquisition Frameworks
Changes in Cultural and Ethnic Identities	Change in traditional behavior	To ensure standard of living is maintained as well as traditional activities sustained	Monetary assistance to maintain traditional activities  Services must be made available to local workers and non-local workers	Resettlement and Land Acquisition Frameworks

Environmental Aspect	Impact	Mitigation Objective/Standard	Project Mitigation Measures	Relevant Plan
Health Issues	Disease transmission	To minimize risk of exposure to local residents and decrease disease transmission rates of construction workers	Regular health testing of construction workers will be implemented by Contractor  Local residents will be educated on disease transmission and personal hygiene  Provide locals and workers with necessary health care services	Community Relations and Health Management Plan
Gender Issues	Women's privacy	To ensure the least disturbance possible to women	The Contractor must establish policies in consultation with local elders/authorities	Workforce and Site Installation Management Plan
Demand for Infrastructure and Utilities	Potential social conflicts over: potable water, medical services, wastewater treatment, fuel and construction materials	To ensure construction workers are provided adequate services and locals receive benefits from these  To ensure activities do not impact local resources  To ensure fuel demands for construction activities do not compromise existing	Caution must be taken to ensure local resources are not impacted by construction camp resources  Additional fuel supplies will be provided to prevent conflict	Workforce and Site Installation Management Plan  Construction Impact Management Plan

Environmental Aspect	Impact	Mitigation Objective/Standard	Project Mitigation Measures	Relevant Plan
Disturbance to Natural Resources	Loss of biodiversity and habitat	To minimize disturbance during clearing and construction	Potable water supplies and wastewater treatment services for the construction camp shall not conflict with local water needs	Aesthetics and Ecological Management Plan
	Increase pressure on water resources	To ensure construction workers and local residents receive potable water and waste water disposal	Rare species habitat will be determined and avoided when possible	
	Wildlife accidents	To minimize the impact on wildlife	Waste will be collected and removed so it does not attract wildlife to the construction sites and camp sites, creating a hazard to workers and local residents	
Resettlement	Loss of homes	To ensure affected people are effectively resettled or compensated	New homes will provide the same standard of living or better to those affected	Resettlement and Land Acquisition Frameworks
	Loss of cultural identity and family networks	To ensure affected people can reestablish traditional way of life in their new location	Social, educational and communication programs will be available to those affected to support resettlement	

Environmental Aspect	Impact	Mitigation Objective/Standard	Project Mitigation Measures	Relevant Plan
Cumulative Effects	Impact of the CASA 1000 Project in conjunction with all past, present and possible future projects and activities within a defined spatial and temporal framework	Minimize cumulative effects and implement effective land and resource management process	Not to exceed threshold or some defined limit of acceptability to system change	Not defined yet

## **4. PLAN COMPONENTS AND STRUCTURE**

This section discusses the specific component of each of the various environmental management plans, their structure, objectives, timing and responsibility for implementation. Preliminary ESMP costs are presented in Section 12.

Figure D4-1 shows the organizational structure of the ESMP for the CASA-1000 Project. The ESMP has the following component areas:

- Workforce and Site Installation Management Plan
- Site Preparation and Restoration Management Plan
- Construction Impact Management Plan
- Waste Management Plan
- Pollution Prevention Plan
- Aesthetics and Ecological Management Plan
- Safety Management Plan
- Physical Cultural Property – Chance Finds Management Plan
- Community Relations and Health Management Plan
- Training and Capacity Building
- Plan Implementation Schedule and Cost

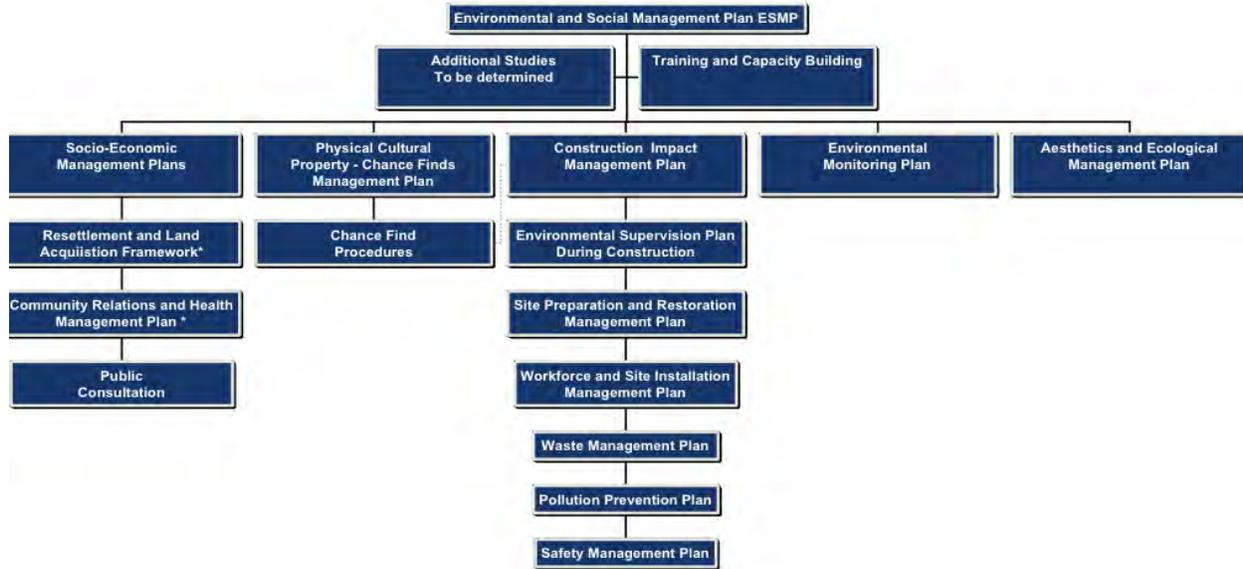
### **4.1 ESMP RESPONSIBILITIES**

ESMP Roles and Responsibilities towards the implementation of the Environmental and Social Management Plan are discussed in Section 5. Table D4-1 shows the primary responsibility for implementation of each plan component. In some cases the primary responsibility may be shared between two organizations.

### **4.2 EMP STRUCTURE, ORGANIZATION AND CONTENT**

The tables that follows describes the objectives, contents, timing and responsibility for each of the management plans described above.

Figure D4-1: Organization of CASA 1000 ESMP



\* Not included in EMP

**Table D4-1: Primary Responsibility of the CASA-1000 EMP**

Plan	PMU & PEO	CSE	Contractor	IEMC
Workforce and Site Installation Management Plan			✓	
Site Preparation and Restoration Management Plan			✓	
Construction Impact Management Plan			✓	
Waste Management Plan			✓	
Pollution Prevention Plan			✓	
Safety Management Plan			✓	
Physical Cultural Property – Chance Finds Management Plan	✓		✓	
Community Relations and Health Management Plan	✓		✓	
Aesthetics and Ecological Management Plan	✓			
Construction Supervision – Environmental/Social		✓		
Environmental and Social Monitoring				✓
Training and Capacity Building	✓	✓	✓	

The tables that follow present a synopsis of various management plans that are contained within this ESMP. Details of each management plan are contained in Annexes 2 through 10.

This ESMP provides a framework for development of specific management plans that are to be produced prior to the onset of construction activities. The responsibilities for plan preparation are indicated in Table D4-1: Primary Responsibility of the CASA-1000 EMP above.

**Table D4-2: Workforce and Campsite Installation Management Plan**

Workforce and Camp Site Installation Management Plan
<p><b>Objectives:</b></p> <p>Minimize negative impacts on local communities and the natural environment from construction camps.</p>
<p><b>Description:</b></p> <p>Preparation of the Workforce and Camp Site Installation Management Plan will be responsibility of the construction contractor. Specifications for preparation of this plan are to be presented in the construction bid.</p> <p>Details are presented in Annex 2. The plan addresses the following elements:</p> <ul style="list-style-type: none"> <li>▪ General Workforce</li> <li>▪ Workers’ Camp and Site Installation Requirements</li> <li>▪ Sanitary Facilities</li> <li>▪ Maintenance of Camp Facilities</li> <li>▪ Medical Facilities</li> <li>▪ Code of Conduct</li> <li>▪ Security</li> <li>▪ Prohibitions</li> <li>▪ Environmental Training for Construction Workers</li> </ul>
<p><b>Timing/Schedule:</b></p> <ul style="list-style-type: none"> <li>▪ Pre-construction: Design requirements, safety and security, sanitary and waste management, camp maintenance, worker code of conduct, prohibitions</li> <li>▪ Construction: camp maintenance and operation, medical and security, environmental training</li> <li>▪ Operation: camp site restoration</li> <li>▪ The plan shall be in place 2 months after the onset of construction.</li> </ul>
<p><b>Responsibility:</b></p> <ul style="list-style-type: none"> <li>▪ Preparation and implementation of the Workforce and Camp Site Installation Management Plan will be the responsibility of the Construction Contractor.</li> <li>▪ The PMU and PEO in each of the four CASAREM countries will prepare bid documents incorporating plan provisions.</li> <li>▪ The Supervising Consultant will oversee implementation of the plan.</li> </ul> <p>The PEO will review compliance of plan implementation against the plan terms of reference.</p>

**Table D4-3: Site Preparation and Restoration Management Plan**

Site Preparation and Restoration Management Plan
<p><b>Objectives:</b></p> <p>Minimize impacts of site clearing and preparation associated with construction of the CASA 1000 project and ensure site restoration is completed to pre-existing conditions, or as agreed to by all parties regarding final end land use.</p>
<p><b>Description:</b></p> <p>The Site Preparation and Restoration Management Plan contains provisions for the clearing of construction camps, tower locations and the Right-of-Way as required, timber salvage, revegetation and site restoration and special provisions adjacent to communities and residential areas. Plan preparation will be responsibility of the construction contractor. Specifications for preparation of this plan are to be presented in the construction bid. Details are presented in Annex 3.</p> <p>The plan addresses the following elements:</p> <ul style="list-style-type: none"> <li>▪ Clearing of construction areas and timber salvage</li> <li>▪ Revegetation and restoration</li> <li>▪ Special provisions for communities and residential areas</li> </ul>
<p><b>Timing/Schedule:</b></p> <ul style="list-style-type: none"> <li>▪ Pre-construction: Site clearing and ROW preparation plan</li> <li>▪ Construction: Site restoration for temporary construction disturbance</li> <li>▪ Operation: Camp site restoration</li> <li>▪ Decommissioning: Site restoration</li> <li>▪ The plan shall be in place 2 months after the onset of construction.</li> </ul>
<p><b>Responsibility:</b></p> <ul style="list-style-type: none"> <li>▪ Preparation and implementation of the Site Preparation and Restoration Management Plan will be the responsibility of the Construction Contractor.</li> <li>▪ The PMU and PEO in each of the four CASAREM countries will prepare bid documents incorporating plan provisions.</li> <li>▪ The Supervising Consultant will oversee implementation of the plan.</li> </ul> <p>The PEO will review compliance of plan implementation against the plan terms of reference.</p>

**Table D4-4: Construction Impact Management Plan**

Construction Impact Management Plan	
<b>Objectives:</b>	Minimize negative impacts of construction activities on local communities and the natural environment.
<b>Description:</b>	<p>The Construction Impact Management Plan will contain detailed method statements and mitigation measures as to how construction related impacts on the natural environment and local communities will be minimized.</p> <p>Preparation of the Construction Impact Management Plan will be responsibility of the construction contractor. Specifications for preparation of this plan are to be presented in the construction bid. Details are presented in Annex 4. The plan addresses the following elements:</p> <ul style="list-style-type: none"> <li>▪ New and Existing Access Roads</li> <li>▪ Substations</li> <li>▪ Erosion and Sedimentation Control</li> <li>▪ Emissions and Dust</li> <li>▪ Noise Control</li> <li>▪ Earthworks, Cuts and Fill Slopes</li> <li>▪ Stockpiles, Quarries and Borrow Pits</li> <li>▪ Soil Compaction</li> </ul>
<b>Timing/Schedule:</b>	<ul style="list-style-type: none"> <li>▪ Pre-construction: Design requirements and method statements developed, access management plan prepared</li> <li>▪ Construction: implementation of detailed mitigation measures</li> <li>▪ The plan shall be in place 2 months after the onset of construction.</li> </ul>
<b>Responsibility:</b>	<ul style="list-style-type: none"> <li>▪ Preparation and implementation of the Construction Impact Management Plan will be the responsibility of the Construction Contractor.</li> <li>▪ The PMU and PEO in each of the four CASAREM countries will prepare bid documents incorporating plan provisions.</li> <li>▪ The Supervising Consultant will oversee implementation of the plan.</li> <li>▪ The PEO will review compliance of plan implementation against the plan terms of reference.</li> </ul>

**Table D4-5: Waste Management Plan**

Waste Management Plan
<p><b>Objectives:</b></p> <p>To minimize impacts of solid and liquid waste discharges on the natural environment and local communities during construction.</p>
<p><b>Description:</b></p> <p>The waste management plan will address management of site runoff, wastewater (grey and black), solid waste discharges and hazardous and chemical waste.</p> <p>Preparation of the Waste Management Plan will be responsibility of the construction contractor. Specifications for preparation of this plan are to be presented in the construction bid. Details are presented in Annex 5. The plan addresses the following elements:</p> <ul style="list-style-type: none"> <li>▪ Site runoff and drainage</li> <li>▪ Wastewater – black and grey</li> <li>▪ Solid waste – spoil and construction waste</li> <li>▪ Domestic waste</li> <li>▪ Hazardous and chemical waste</li> </ul>
<p><b>Timing/Schedule:</b></p> <ul style="list-style-type: none"> <li>▪ Pre-construction: Design requirements of wastewater treatment facilities, identification of waste disposal sites, waste transportation and manifest procedures, waste tracking and waste register procedures</li> <li>▪ Construction: implementation of detailed mitigation measures, waste audits</li> <li>▪ The plan shall be in place 2 months after the onset of construction.</li> </ul>
<p><b>Responsibility:</b></p> <ul style="list-style-type: none"> <li>▪ Preparation and implementation of the Waste Management Plan will be the responsibility of the Construction Contractor.</li> <li>▪ The Contractor will be responsible for waste tracking procedures, registers and manifests.</li> <li>▪ The PMU and PEO in each of the four CASAREM countries will prepare bid documents incorporating plan provisions.</li> <li>▪ The PEO will oversee implementation of the plan.</li> </ul>

**Table D4-6: Pollution Prevention Plan**

Pollution Prevention Plan
<p><b>Objectives:</b> To minimize the impact of accidental or other discharges on the natural environment and local communities.</p>
<p><b>Description:</b> The Pollution Prevention Plan details measures the contractor will take to prevent accidental discharges of construction related discharges on the environment and local communities. The Pollution Prevention Plan also details response and cleanup measures in the event of a spill or incident.</p> <p>Preparation of the Pollution Prevention Plan will be responsibility of the construction contractor. Specifications for preparation of this plan are to be presented in the construction bid. Details are presented in Annex 6. The plan addresses the following elements:</p> <ul style="list-style-type: none"> <li>▪ Maintenance on the RoW and Camps during construction</li> <li>▪ Maintenance of construction equipment</li> <li>▪ Material transportation and storage</li> <li>▪ Hazardous and chemical substances</li> </ul>
<p><b>Timing/Schedule:</b></p> <ul style="list-style-type: none"> <li>▪ Pre-construction: Design requirements for chemical, hazardous and other material storage, MSDS implementation at all worksites, identification of material transportation routes.</li> <li>▪ Construction: implementation of material storage procedures, camp, construction and RoW pollution prevention procedures, audits and monitoring</li> <li>▪ The plan shall be in place 2 months after the onset of construction.</li> </ul>
<p><b>Responsibility:</b></p> <ul style="list-style-type: none"> <li>▪ Preparation and implementation of the Pollution Prevention Plan will be the responsibility of the Construction Contractor.</li> <li>▪ The Contractor will be responsible for storage of all project related construction materials and ensuring their safe storage.</li> <li>▪ The PMU and PEO in each of the four CASAREM countries will prepare bid documents incorporating plan provisions.</li> <li>▪ The PEO will oversee implementation of the plan.</li> </ul>

**Table D4-7: Aesthetics and Ecological Management Plan**

Aesthetics and Ecological Management Plan
<p><b>Objectives:</b></p> <p>To put in place measures to protect landscape and scenic views, native flora and fauna, agricultural or pastoral lands, watercourses, wetlands and forested lands along the CASA 1000 RoW.</p>
<p><b>Description:</b></p> <p>The design, location, construction, and RoW management of the CASA project can mitigate some of the adverse aesthetic effects and ecological effects on natural landscapes, flora, fauna and visual resources.</p> <p>Preparation of the Aesthetics and Ecological Plan will be responsibility of the PMU and ECO. Aspects of this plan may be presented in the construction bid. Details are presented in Annex 7.</p> <p>The plan addresses the following elements:</p> <ul style="list-style-type: none"> <li>▪ Visual aesthetics and landscape management</li> <li>▪ Flora and Fauna</li> <li>▪ Impacts on protected areas, reserves or areas of ecological importance</li> <li>▪ Bird protection and minimizing bird strikes</li> <li>▪ Agricultural lands, pasture and grasslands</li> <li>▪ Watercourses</li> <li>▪ Wetlands</li> <li>▪ Woodlands (where they naturally occur)</li> </ul>
<p><b>Timing/Schedule:</b></p> <ul style="list-style-type: none"> <li>▪ Pre-construction: detailed routing for final selection of RoW, identification of any aesthetic or ecological constraints, if any, preparation of a plan to avoid and mitigate bird strikes where relevant.</li> <li>▪ Construction: implementation of mitigation measures, monitoring.</li> <li>▪ The plan shall be in place at least 3 months prior to the onset of construction.</li> </ul>
<p><b>Responsibility:</b></p> <ul style="list-style-type: none"> <li>▪ Preparation and implementation of the Pollution Prevention Plan will be the responsibility of the PEO/PMU.</li> <li>▪ The Contractor will be responsible for implementation of all aesthetic and ecological protection measures.</li> <li>▪ The PEO will oversee implementation of the plan.</li> </ul>

**Table D4-8: Safety Management Plan**

Safety Management Plan
<p><b>Objectives:</b> To ensure the safety of all CASA-1000 workers and local communities</p>
<p><b>Description:</b></p> <p>The Safety Management Plan will address safety aspects of construction of the CASA 1000 project including construction site safety, blasting, fire control, unexploded ordinance, airports/airstrips, traffic management and environmental emergencies.</p> <p>Preparation of the Safety Management Plan will be responsibility of the construction contractor. Specifications for preparation of this plan are to be presented in the construction bid. Details are presented in Annex 8. The plan addresses the following elements:</p> <ul style="list-style-type: none"> <li>▪ Construction site safety</li> <li>▪ Blasting</li> <li>▪ Fire Control</li> <li>▪ Landmines and UXO</li> <li>▪ Airports and airstrips</li> <li>▪ Electrical shock hazards</li> <li>▪ Traffic safety</li> <li>▪ Environmental Emergency Procedures</li> </ul>
<p><b>Timing/Schedule:</b></p> <ul style="list-style-type: none"> <li>▪ Pre-construction: Survey of final detailed routing for UXO and landmines, preparation of safety plan, training plan for workers.</li> <li>▪ Construction: implementation of safety procedures, safety training and record system, PPE provision, safety checks and safety audits.</li> <li>▪ The plan shall be in place at the onset of construction.</li> </ul>
<p><b>Responsibility:</b></p> <ul style="list-style-type: none"> <li>▪ Preparation and implementation of the Safety Management Plan will be the responsibility of the Construction Contractor.</li> <li>▪ The Contractor will be responsible for all safety related procedures for CASA 1000 personnel.</li> <li>▪ The PMU and PEO in each of the four CASAREM countries will prepare bid documents incorporating plan provisions.</li> <li>▪ The PEO/CSE will oversee implementation of the plan.</li> </ul>

**Table D4-9: Physical Cultural Property Chance Find Procedures Plan**

<b>Physical Cultural Property Chance Find Procedures Plan</b>	
<b>Objectives:</b>	To prevent any inadvertent loss of physical and cultural resources during project construction.
<b>Description:</b>	<ul style="list-style-type: none"> <li>▪ Physical and cultural resources (chance finds) may be encountered during construction. The Contractor will develop a Physical Cultural Property Chance Find Procedures Plan that identifies what measures shall be taken to protect these cultural resources.</li> <li>▪ Chance Find Procedures, which identify what measures should be taken in the event that physical cultural resources are encountered, are outlined in Annex 9.</li> <li>▪ The plan should also address measures to monitor physical cultural sites in the vicinity of COI and implement measures to protect these sites.</li> </ul>
<b>Timing/Schedule:</b>	The Physical Cultural Property Chance Find Procedures Plan shall be in place two months prior to the onset of site construction works for the main project site.
<b>Responsibility:</b>	<ul style="list-style-type: none"> <li>▪ Preparation and implementation of the Physical Cultural Property Chance Find Procedures Plan will be the responsibility of the Construction Contractor.</li> <li>▪ The Contractor will be responsible for all loss or damage to physical cultural resources that occur due to non-implementation of this plan</li> <li>▪ The PMU and PEO in each of the four CASAREM countries will prepare bid documents incorporating plan provisions.</li> <li>▪ The Construction Contractor shall coordinate the preparation and implementation of the Physical Cultural Resources Management Plan for review by the PEO and the appropriate cultural authority or Ministry in each of the four CASAREM countries.</li> <li>▪ The PEO will oversee implementation of the plan.</li> </ul>

**Table D4-10: Community Relations and Health Management Plan**

Community Relations and Health Management Plan
<p><b>Objectives:</b></p> <p>To maintain good community relations along the entire CASA-1000 RoW during construction and to minimize health related impacts to project personnel and local communities.</p>
<p><b>Description:</b></p> <p>The Construction Contractor will be required to complete a Community Relations and Health Management Plan. Plan details are presented in Annex 10.</p> <p><b>Community Relations</b></p> <p>The Contractor shall prepare a Community Relations and Community Safety Plan aimed at the following:</p> <ul style="list-style-type: none"> <li>▪ To inform the population about construction and work schedules, interruption of services, traffic detour routes and construction restrictions as appropriate;</li> <li>▪ To ensure that construction activities shall occur mainly during daylight hours. If necessary, night work shall be carefully scheduled and local communities shall be properly informed;</li> <li>▪ To provide adequate notification - at least five days in advance of any service interruption (including water, electricity, telephone, and transportation routes) the community must be advised appropriately;</li> <li>▪ Maintain open communications between local governments and communities;</li> <li>▪ Maintain a mailing list to include interested agencies, organizations, tribal groups and residents - disseminate project information to all affected parties; and</li> <li>▪ Respond to telephone inquiries and written correspondence in a timely and accurate manner and provide a grievance mechanism and means for addressing disputes or concerns.</li> </ul> <p><b>Worker and Community Health</b></p> <ul style="list-style-type: none"> <li>▪ Screen workers prior to and during employment;</li> <li>▪ Implementation education on health and provide vaccinations;</li> <li>▪ Implement programs for control of STDs, especially HIV/AIDS;</li> <li>▪ Provide basic first aid services to workers and emergency services, when needed;</li> <li>▪ Implement a pest management program; and</li> <li>▪ Ensure proper operations of water supply and treatment systems.</li> </ul>
<p><b>Timing/Schedule:</b></p> <p>The Community Relations and Community Safety Plan shall be in place two months after the onset of construction</p>
<p><b>Responsibility:</b></p> <ul style="list-style-type: none"> <li>▪ Preparation and implementation of the Community Relations and Health Management Plan will be the responsibility of the Construction Contractor.</li> <li>▪ Local authorities will coordinate their regional health programs with the Construction Contractor in regard to community health;</li> <li>▪ The PMU and PEO in each of the four CASAREM countries will prepare bid documents incorporating plan provisions.</li> <li>▪ The PEO will oversee implementation of the plan.</li> </ul>

**Table D4-11: Environmental Monitoring Plan**

Environmental Monitoring Plan
<p><b>Objectives:</b></p> <p>The objectives of the environmental monitoring plan are to a) ensure project components are compliant with all laws and approval conditions; b) to measure the success of proposed mitigation measures; c) to continue baseline monitoring and d) to facilitate a continual review of post-construction and operation activities.</p>
<p><b>Description:</b></p> <p>Environmental monitoring will be done during construction and operation. Details of the proposed environmental monitoring program are presented in Section 7 of the ESMP. The focus of monitoring during the construction phase will be to implement systematic observations to periodically measure the success of proposed mitigation measures and continue baseline data collection following EIA completion.</p> <p>Environmental sampling during the construction phase will be done by the Environmental Unit and/or IEMC. Specific monitoring aspects to be addressed during construction include:</p> <ul style="list-style-type: none"> <li>▪ Noise</li> <li>▪ Air quality</li> <li>▪ Water quality and water resources</li> <li>▪ Sedimentation and erosion</li> <li>▪ Protected and ecological areas of importance, if applicable</li> <li>▪ Physical cultural resources</li> <li>▪ Access roads</li> <li>▪ Resettlement of displaced persons</li> <li>▪ Land acquisition and compensation</li> <li>▪ Reclamation</li> </ul> <p>Oversight and performance assessment of monitoring activities shall be carried out by the Independent Environmental Monitoring Consultant (IEMC).</p>
<p><b>Timing/Schedule:</b></p> <p>Environmental monitoring shall start as soon as the project is given the go-ahead, and monitors shall be ready to be mobilized prior to the onset of construction activities.</p>
<p><b>Responsibility:</b></p> <ul style="list-style-type: none"> <li>▪ The IEMC shall be responsible for environmental monitoring during construction.</li> <li>▪ The PMU and PEO in each of the four CASAREM countries will prepare work scopes for environmental monitoring.</li> <li>▪ The PEO will oversee the environmental monitoring program.</li> </ul>



## 5. ESMP ROLES AND RESPONSIBILITIES - CONSTRUCTION

The implementation of environmental procedures for the CASA-1000 Project requires the involvement of several agencies and institutions within each of the four CASAREM countries, each fulfilling a different but vital role, to ensure effective environmental and management during the construction of the Project.

While the final decision for the structure of environmental and social management responsibilities will be made by the regulatory authorities in each of the four CASAREM countries, the following structure is proposed as a guideline as to how a multi-tiered mechanism for environmental responsibility could be developed. Five organizational layers are suggested.

The following section deals only with construction aspects. Similar operational measures and procedures will be developed prior to onset of operations.

### Five Organizational Layers of the ESMP

- Project Management Unit (PMU) – the National Electricity Board or comparable institution for overall environmental and social responsibility at the national level;
- Environmental Control Officer – day to day implementation of environmental responsibility on behalf of the PMU;
- Construction Supervision Engineer
- Construction Contractor
- Independent Environmental Monitoring Consultant (IEMC)

### 5.1 PROJECT MANAGEMENT UNIT (PMU) OF THE NATIONAL ELECTRICITY BOARD (NEB)

The NEB, or equivalent regulatory authority in each CASAREM country, has the overall responsibility for environmental and social performance of CASA-1000 project. The NEB shall appoint a Project Management Unit (PMU), which will be the executing agency for the Project. As such, the PMU will be responsible for environmental and social management with, but not limited to, the following specific responsibilities:

- Responsible for day to day supervision and management of all aspects of project preparation and construction, including procurement and the signing of contracts on behalf of the NEB;
- Coordination with local authorities to facilitate the participation of local communities and projected affected persons during project preparation and implementation;
- Responsible for ensuring that the requirements of World Bank safeguards policies (and other IFI lender requirements) are met and that all measures set out in the project Environmental and Social Management Plan (ESMP), the respective ESAs and other project environmental and social documentation are carried out;
- Ensure that project commitments of the construction contractor are fulfilled, including the detailed development of project level specific environmental and social management plans as outlined in this document;

- Report ongoing status ESMP implementation to the World Bank, other lenders and the NEB; and
- Develop full time professional and other safeguard (e.g., resettlement) staff to assist with supervision and management efforts for environmental and social management of project preparation and construction phases.

## **5.2 PROJECT ENVIRONMENTAL OFFICER (PEO)**

The PMU shall engage the services of a Project Environmental Officer (PEO), who will be the person responsible for overall coordination of ESMP implementation. The PEO must have adequate professional knowledge and capacity on the principles of environmental management systems (EMS), construction impacts relating to transmission lines, and be versed in the national legislative requirements as they apply to environmental and social management as outlined in the ESMP. The PEO should report directly to the PMU, or the NEB only.

The PEO, and their delegated personnel, shall have the authority to stop construction works if in his/her opinion there is/may be a serious threat or impact to the environment or local communities caused directly or indirectly by the construction operations. His/her authority shall also extend to emergency situations where consultation with the Construction Supervision Engineers (CSE) is not immediately possible. In all such work stoppage situations, the PEO is to inform the CSE of the reasons for the stoppage within 24 hours of occurrence of the non-compliant event.

Upon failure by the Contractor or their employees, or subcontractors, to show adequate consideration to the environmental and social aspects of this ESMP, the PEO may recommend to the CSE to have the Construction Contractor's representative or any employee(s) removed from the work site, fined or suspend all work until the non-compliant matter is effectively remedied. No extension of time will be granted in the case of such suspensions and all costs will be borne by the Construction Contractor. The PEO shall be on-site daily during the construction phase.

The duties of the PEO shall include the following:

- Ensure that the ESMP is implemented in compliance with relevant legislation;
- Assist the PMU in ensuring that the necessary environmental authorizations and permits have been obtained;
- Maintain open and direct lines of communication between PMU, the CSE and the Contractors with regard to environmental and social matters;
- Monthly reporting to PMU on environmental issues at construction sites;
- Review and approve the Contractor's construction method statements;
- Organize regular site inspections of all construction areas with regard to compliance with the ESMP;

- Monitor and verify adherence to the ESMP at all times, and that environmental and social impacts are kept to a minimum;
- Coordinate oversight and response to ESMP non-compliances with the CSE and SES;
- Take appropriate action if the specifications are not followed; and
- Assist the Contractor in finding environmentally and socially responsible solutions to problems.

### 5.3 CONSTRUCTION SUPERVISION ENGINEERS (CSE) AND THE WORKPLACE SAFETY AND ENVIRONMENTAL SUPERVISOR (SES)

The Construction Supervision Engineers (CSE) are generally included in the Project team and responsible for inspection, supervision, audits and oversight of all construction related works and other activities undertaken by the Contractor(s), and for ensuring compliance with the environmental specification and contractual requirements. The CSE shall include qualified staff (e.g. Environmental Engineers or EMS specialists) with adequate knowledge on environmental protection and construction project management to perform the required duties and to supervise the Contractor's performance. The CSE team shall be led by a **Safety and Environment Supervisor (SES)** who shall have extensive experience in construction management and oversight, environmental management, supervision and monitoring on construction projects and be familiar with environmental legislatives requirements. The terms of Reference for the CSE shall be clearly stipulated in the contract signed between CSE and NEB. The CSE shall report to PMU. Depending on the project requirements, CSE personnel may be required to work full-time on-site.

The responsibilities of the CSE and the SES include, but are not limited to:

- Integrate project engineering design and the ESMP with regard to environmental/social protection and impact mitigation. Construction shall not commence until this review has been completed and the CSE is satisfied with environmental and social management measures compliant with the ESMP;
- Provide assistance to the PEO as necessary in the implementation of the environmental monitoring and supervising program;
- Regularly monitor the performance of the Contractor's environment staff, verifying monitoring methodologies and results. In case the CSE considers that the Contractor's environment staff fails to discharge duties or fails to comply with the contractual requirements, work with the PEO to instruct the Contractor(s) to replace the Contractor's environment staff;
- Instruct the Construction Contractors to take corrective action within the CSE determined response timeframe;
- Supervise the Construction Contractor's activities and ensure that the requirements of the ESMP and contract specifications are fully complied with;

- Instruct the Contractor(s) to take actions to reduce impacts and follow the required ESMP procedures in case of identified non-compliance and/or discrepancies;
- In the case of Chance Find identification, the CSE will order the Construction Contractor to provide site protection and report to relevant authorities and the PEO;
- Request and monitor Construction Contractor to cut trees and vegetation and clear terrain strictly in accordance with the pre-determined area, numbers, species, etc.;
- Engage a qualified staff, preferably a Landscape Architect, to review and monitor the Contractor's submitted Site Preparation and Restoration Management Plan, and to supervise the Contractor's landscaping works where required;
- Ensure that all social management procedures are fully implemented by the Construction Contractor including oversight of compensation and resettlement and effective implementation of grievance procedures; and
- Adhere to the procedures for carrying out complaint investigation.

Terms of reference for Environmental Supervision are presented in Annex 12.

#### **5.4 THE CONSTRUCTION CONTRACTOR AND SUB-CONTRACTORS**

The Contractor, all employees and sub-contractors shall adhere to the mitigation measures set in the ESMP to minimize project impacts on the environment and local communities.

Remedial actions which cannot be effectively carried out during construction should be carried out on completion of the works (and before issuance of the acceptance of completion of works).

The duties of the Construction Contractor and his Sub-Contractors include but not limited to:

- Compliance with relevant legislative requirements governing the environment, public health and safety;
- Compliance with the ESMP and establish an internal environmental and social unit to prepare and implement specific management sub-plans;
- Complete day to day supervision and compliance of construction operation through the SEO to ensure ESMP provisions are upheld;
- Work within the scope of contractual requirements and other tender conditions for compliance with the ESMP and other applicable environmental and social documentation;
- Organize representatives of the construction team to participate in the joint site inspections undertaken by the CSE/SES;

- Carry out any corrective actions as instructed by the PEO or the CSE/SES;
- Provide and update information to the PEO regarding works activities which may contribute, or be continuing to the generation of adverse environmental conditions;
- In case of non-compliances/discrepancies, carry out investigation and submit proposals on mitigation measures, and implement remedial measures to reduce environmental impact; and
- Stop construction activities which generate adverse impacts upon receiving instructions from the PEO. Propose and carry out corrective actions and implement alternative construction method, if required, in order to minimize the environmental impacts. Major non-compliance by the Contractor will be cause for suspension of works and other penalties until the non-compliance has been resolved to the satisfaction of the PEO.

#### 5.4.1 CONTRACTOR'S SITE ENVIRONMENTAL OFFICER (SEO)

The Construction Contractor will be required to appoint at least one competent individual as the **Contractor's Site Environmental Officer (SEO)**. The SEO must be appropriately trained in environmental/social management and must possess the skills necessary to impart environmental and social management and performance measures to all company personnel. The qualifications and competence of the proposed SEO shall be approved by the PMU/PEO prior to commencement of the project. The SEO will be responsible for overseeing the Contractor's internal compliance with the ESMP requirements and ensuring that the environmental specifications are adhered to. The SEO will be a full-time employee of the Construction Contractor.

The SEO will be responsible for monitoring the Contractor's compliance with the ESMP requirements and the environmental specifications. The duties of the SEO shall include but not be limited to the following:

- Carry out environmental site inspections to assess and audit the Contractors' site practice, equipment and work methodologies with respect to pollution control and adequacy of environmental mitigation measures implemented;
- Monitor compliance with environmental protection measures, pollution prevention and control measures and contractual requirements;
- Ensure education, training and awareness of all employees and subcontractors in regard to ESMP provisions and specifically in relation to their respective job duties;
- Monitor the implementation of environmental mitigation measures;
- Prepare audit reports for the environmental monitoring data and site environmental conditions for submission to the PEO and CSE/SES;
- Investigate complaints and recommend any required corrective measures;

- Advise the Contractor on environmental improvement, awareness and proactive pollution prevention measures;
- Complete start-up, weekly, monthly and site-closure checklists;
- Follow the procedures in the ESMP and recommend suitable mitigation measures to the Contractor in the case of non-compliance. Carry out additional monitoring of noncompliance within the specified timeframe instructed by the PEO;
- Liaise with the Construction Contractor Site Manager, CSE and PEO on all environmental performance matters; and Contractor's submission of ESMP Implementation Plan reports to the PEO, SES, and relevant administrative authorities, if required;
- Keep detailed records of all site activities that may pertain to the environment;
- Supervise construction works where environmental and social management is a key aspect (e.g. in sensitive areas, with high environmental risk, etc.);
- Strengthen coordination with the CSE and PEO;
- Keep a photographic record of progress on site from an environmental and social perspective;
- Prepare and maintain registers documenting environmental performance (e.g. waste management, wastewater management etc.);
- Keep a register of complaints in the site office and recording and dealing with any community comments or issues; and
- Keep a record of on-site incidents and accidents and how these were dealt with.

## **5.5 INDEPENDENT ENVIRONMENTAL MONITORING CONSULTANT (IEMC)**

The IEMC shall be a professionally accredited organization directly appointed by NEB. The IEMC shall have extensive knowledge and experience in environmental monitoring and auditing to provide independent, objective and professional advice on the environmental performance of the project. The IEMC shall monitor the Contractor's ESMP implementation plan in both construction and operation stages. The IEMC will also be responsible to prepare monitoring reports on ESMP implementation and submit these reports to PMU for approval. In order to minimize potential conflict of interests, the IEMC shall not be part of PMU, NEB, or the Construction Supervision Team.

The IEMC will perform the following duties:

- The IEMC shall familiarize himself with the project works through review of the reports, including the project ESIA and ESMP;

- Review and audit in an independent, objective and professional manner all aspects of the ESMP;
- Validate and confirm the accuracy of monitoring results, monitoring equipment, monitoring locations, monitoring procedures and locations of sensitive receivers;
- Carry out random sample checks and audits of monitoring data and sampling procedures, etc;
- Conduct random site inspections;
- Audit the ESIA recommendations, commitments and requirements against the status of implementation of environmental protection measures;
- Review the effectiveness of environmental mitigation measures and project environmental performance;
- Verify the investigation results of any non-compliance of the environmental quality performance and the effectiveness of corrective measures; and
- Submit audit results to the PEO, and SES according to ESMP procedures.

Complete terms of Reference for the Independent Environmental Monitoring Consultant are presented in Annex 13.

## **5.6 PROJECT INITIATION AND STAFFING**

The PMU should be put in place in a timely manner to ensure that can adequately manage and execute the Project within each CASAREM country.

It is anticipated that the CSE and the SES, will be mobilized one month before the start of construction activities. The one month start up time will be utilized by the SES to review and familiarize itself with the project, the project design, the technical specifications, contract documents, the EIA, ESMP and other project relevant documents and reports. Following the review, the SES will prepare a brief report on the potential issues and challenges arising from the implementation of the ESMP and the condition of contracts and make recommendations to the PEO/PMU about how best to improve the implementation of the ESMP. The PEO is expected to be mobilized at the beginning of the contract, to prepare the necessary guidelines, documentation, training, etc.

The Construction Contractor shall ensure that the SEO is put in place prior to mobilization and provided with all resources and personnel necessary to complete their job as specified above.

## **5.7 ENVIRONMENTAL COMPLIANCE FRAMEWORK**

The following sections details how initial compliance with the ESMP will be incorporated during project design and during construction.

### **5.7.1 CONTRACTOR'S ESMP IMPLEMENTATION PLAN**

Prior to commencement of construction activities, the Contractor will be required to submit a detailed ESMP Implementation Plan to the PEO/PMU based on the Contractor's actual construction methodologies, work program, method statements, management of construction activities and management of the workforce during construction. The ESMP Implementation Plan shall demonstrate compliance with local environmental requirements, provisions of this ESMP, implementation of mitigation measures set down in the general specifications for Contractors (see Annex 1-10) and World Bank safeguards, other IFI lender requirements, and relevant applicable policies and standards. The content of the Contractor's ESMP shall detail how specific ESMP sub-plans will be prepared and shall be enhanced by the Contractor's works practices, implementation procedures and program. The Plan shall be certified by the SEO and verified by the SES in accordance with the project and the ESIA requirements and, approved by the PEO/PMU.

The Contractor's ESMP Implementation Plan shall provide details such as commitment to environmental protection by the Contractor's employees; specific methods for implementing the project ESMP; detailed designs and installation of pollution control and prevention facilities (e.g. drainage channels, settling tanks, noise and dust reduction, access control etc); environmental control mechanisms; detailed management plans and site operation plans outlining proposed measures to minimize, mitigate and manage the effects for the duration of the construction works; and environmental monitoring program during different stages of construction period (see ESMP Annexes for guidance on sub-plan content).

### **5.8 CONSTRUCTION CONTRACTOR MANAGEMENT**

It is recognized that the Construction Contractor will be a key component of environmental and social management, pollution control and impact mitigation during construction. A number of measures will be taken to ensure that the Construction Contractor is fully aware of their responsibilities and obligations towards the ESMP. These measures shall include:

- ESMP specifications presented in Annex 1-10 will be included in tendering documents for Construction Contractors as qualification and selection criteria and eventually in the construction contract. Contractors will be required to monitor their environmental activities and provide a diary on environmental performance on a daily or weekly basis. These records will be subject to supervision and review by the PEO, and SES;
- Contractors will be required to communicate and consult with project affected communities near the construction work site. A visible public notice board shall be established in the immediate vicinity of the Project ROW, or other central location, to notify the public of the main construction activities and their duration. The board shall also provide contact names and telephone numbers to the public to express their concerns and complaints about the construction activities;

- All contractors and their staff as well as the CSE will be required to participate in a mandatory environmental/social training program prior to the start of construction onsite. The contents of the environmental training program shall cover:
  - National and local environmental regulations and standards;
  - Technical guidelines on environmental/social protection and management;
  - ESMP, ESIA and other project related documentation;
  - Environmental monitoring methods and requirements, as well as reporting and communication procedures;
  - Mitigation measures;
  - Regulations for evaluation and protection of cultural heritage;
  - Emergency response measures;
  - Worker code of conduct and project prohibitions;
  - Long-term public consultation and response; and
  - Obligation of the contractor to environmental and social protection and management.

Training and compliance to the ESMP shall be considered an ongoing process and procedures will be developed to enforce these measures at the start and close of each working day.

In addition, the CSE shall be responsible for implementation of Project mitigation measures. The requirements for Construction Supervision for environmental and social management will be included in all bid documents.

## **5.9 COMPLIANCE WITH LEGAL AND CONTRACTUAL REQUIREMENTS**

The Construction Contractor and all subcontractors shall comply not only with the environmental and social specifications and provisions of the ESMP on an on-going basis, but also with environmental protection and pollution control laws and regulations of each country. Any failure on their part to do so will entitle the PEO/PMU to impose a financial penalty. For minor infringements—an incident which causes temporary but reversible damage—the Contractor (s) will be given a reasonable period of time to remediate the problem and to restore the environment.

In the event of non-compliance the following recommended process shall be followed:

- If the SEO or the SES concludes that the current status on license/permit application and any environmental protection and pollution control preparation works may not comply with the proposed construction works, or may result in potential violation of ESMP environmental and

social protection and pollution control requirements, they shall notify the Contractor and the PEO accordingly;

- The PEO/PMU shall issue a notice of non-compliance to the Contractor, stating the nature and magnitude of the contravention. A copy shall be provided to the CSE;
- The Contractor shall act to correct the non-compliance within 24 hours of receipt of the notice, or within a period that may be specified within the notice;
- The Contractor shall provide the PEO/PMU with a written statement describing the actions to be taken to discontinue the non-conformance, the actions taken to mitigate its effects and the expected results of the actions. A copy shall be provided to the CSE/SES. If restoration is done satisfactorily during the established period, no further actions will be taken;
- In the case the Contractor fails to remedy the situation within the predetermined time frame, the PEO/PMU shall impose a monetary penalty based on the conditions of the contract;
- In the case of non-compliance giving rise to physical environmental damage or destruction, the PEO/PMU shall be entitled to undertake or to cause to be undertaken such remedial works as may be required to make good such damage and to recover from the Contractor the full costs incurred in doing so;
- In the event of a dispute, difference of opinion, etc. between any parties in regard to or arising out of interpretation of the conditions of the ESMP, disagreement regarding the implementation or method of implementation of conditions of the EMP, etc. any party shall be entitled to require that the issue be referred to specialists or government authorities for arbitration determination; and
- The PEO shall at all times have the right to stop work and/or certain activities on site in the case of non-compliance or failure to implement agreed to remediation measures.

If remedial measures are not completed within the specified time period granted, the PEO/PMU will immediately arrange for another contractor to do the restoration, and deduct that cost from the Construction Contractor's next payment. For major infringements—an incident where there is long-term or irreversible damage—there will be a financial penalty in addition to the cost for restoration activities. To minimize the damage, the restoration activities will be implemented without delay.

The Construction Contractor(s) shall regularly copy relevant documents to the PEO and the SES. The document shall at least include the updated Work Progress Reports, the updated Works Program, and the application letters for different license/permits under the environmental protection laws, and all the valid license/permit. The PEO and the SEO shall also have access, upon request, to the Site Log-Book.

After reviewing the documents, the PEO shall advise the PMU and the Contractor of any non-compliance with the contractual and legislative requirements on environmental protection and pollution control for them to take follow-up actions. If the PEO or the SES concludes that the current status on license/permit

application and any environmental protection and pollution control preparation works may not comply with the works program, or may result in potential violation of environmental protection and pollution control requirements by the works in due course, they shall notify the Contractor and the PMU accordingly.

#### **5.10 PENALTY SYSTEM**

Any inexcusable non-compliance with the conditions of the ESMP shall be considered sufficient ground for the imposition of a financial penalty. A system of penalties for offences in terms of this ESMP shall be proposed as a guideline to be use on site. The PEO may, after consultation with the CSE, adjust these fine values, based on the severity, actual or potential impact and environmental risk involved at the time of the offence. These penalties will be considered additional to any financial penalty imposed for damages by relevant government authorities.



## 6. ENVIRONMENTAL SUPERVISION AND COMPLIANCE FRAMEWORK

Environmental supervision is required during the construction phase to ensure construction activities comply with government regulations and follow the mitigation measures described in the ESIA and this ESMP.

Construction supervision is considered to be an integral component of ensuring Contractor compliance with the ESMP during the CASA 1000 construction phase.

### 6.1 CONSTRUCTION SUPERVISION FRAMEWORK

Supervision of construction activities is continuous during Project activities. The Supervisor will be a designated individual or group and will be accountable for compliance of ESIA and ESMP. Construction supervision will be undertaken by the Construction Supervision Engineer (CSE) and their representatives (see Section 6.2 for a detailed description of supervision roles and responsibilities).

Complete terms of reference for environmental supervision are presented in Annex 12.

### 6.2 CONSTRUCTION SUPERVISION – CONSTRUCTION SUPERVISION ENGINEER (CSE) AND SAFETY ENVIRONMENT SUPERVISOR (SES)

Supervision will be the responsibility of the CSE and their team to ensure the following:

- That the Contractor's documents include the ESMP requirements and ESIA provisions;
- That Contractors and all sub-contractors comply daily with ESMP/ESIA requirements;
- That dedicated resources/personnel are available to supervise ESMP/ESIA performance;
- That compliance audits are scheduled and conducted and results are provided to the World Bank or to the Government of each CASAREM country;
- That mitigation measures are properly monitored and implemented; and
- That data is accurately obtained and recorded for reporting purposes.

The CSE will report to the PEO as indicated in Figure D6-1. Responsibilities of the SES/CSE in regard to supervision of construction works are presented in Table D6-1.

The SEO and the SES shall make reference to the following information/documentation in conducting the inspection:

- The contractor's environmental performance, and ESMP Implementation program;
- Good practices and general environmental mitigation measures;
- Compliance with the ESMP requirements, contractual specification and relevant legislation;

- Protection to sensitive locations and control mechanism to any restricted areas;
- The contractor's construction methodologies and condition of construction equipment;
- Individual work statements or methodology proposals (which shall include proposals on associated pollution control measures);
- Works progress and program;
- The adequacy and efficiency of the contractor's pollution control measures/ treatment facilities for minimizing environmental impacts;
- Landscaping and soil erosion controls;
- Location, management and pollution control at the waste/material storage areas, borrow pits and access roads; and
- Previous site inspection results.

The Contractor shall update the SEO and the SES with all relevant information of the construction contract to carry out the site inspections. The inspection results and its associated recommendations on improvements to the environmental protection and pollution control works shall be submitted in a timely manner to the PMU and the Contractor for reference and immediate remedial action.

### **6.3 SITE INSPECTIONS**

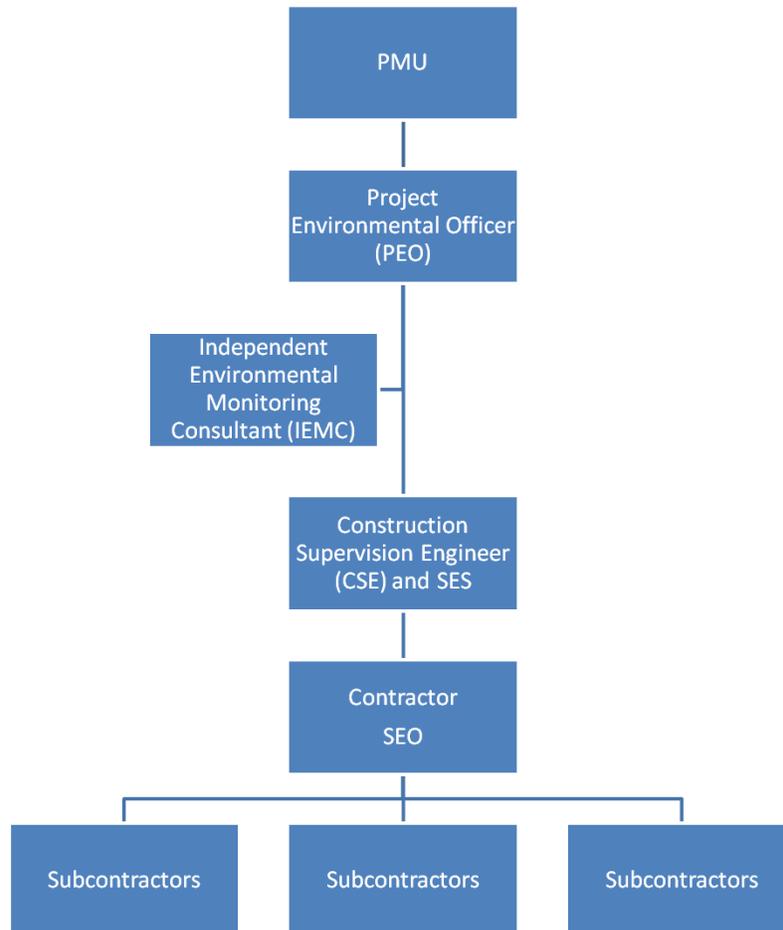
The SEO and the SES shall carry out a supervision program on a daily, or as needed basis, at selected construction site locations and at regular site inspection sites. The supervision program shall include, as a minimum:

- Monitoring of noise levels at identified sensitive receptors by portable monitoring equipment; the monitoring shall take place during construction activities, such as excavation, drilling, power generation, material transportation and night time construction, if any. Noise monitoring shall be conducted near villages, schools, and other sensitive receptors along the project alignment;
- Visual inspections to check for air-borne dust, during demolition, bulk material handling and storage, transportation routes near the villages; and
- Visual inspection to check the water quality in the receiving rivers, fish ponds and lakes affected by any construction activity such as increased turbidity, smell, color, fish kills, etc. Inspections should also include receiving water bodies adjacent to construction sites and construction camps.

During the peak construction period, or at the request from the PEO/ PMU, the SES shall also carry out additional measurements using hand-held equipment in order to determine compliance with ESMP

standards. Once non-compliance with environmental quality performance criteria is identified, additional inspections and monitoring shall be carried out.

**Figure D6-1: Supervision Structure for CASA 1000**



**Table D6-1: Environmental Supervision Framework and Procedures**

Environmental/Social Concern	Parameter	Location	Procedure
<b>Forest / vegetation clearing</b>	Clearing techniques		Daily visual observations
	Waste storage and disposal	Construction sites	Incident reporting Photos
	Exploitation of natural resources	Camp sites	
	Local community involvement as part of LARP		
<b>Noise</b>	Noise generated during construction (hours and days)	Construction sites	Auditory observations or portable noise monitors
	Frequency of disturbance to local residents	Settlements in close proximity	Report forms
<b>Dust</b>	Quantity of dust generated during construction	Construction sites	Daily visual observations
	Need for dust control and availability of water	Access Roads Water withdrawal sites	Incident reporting
<b>Hazardous Waste</b>	Storage location, containment and housekeeping	Hazardous materials storage area	Inventory checklists Incident reporting Photos
<b>Non-Hazardous Construction Waste</b>	Volume generated	Approved disposal location	Waste tracking sheets
	Volume disposed	Construction sites	Incident reporting Photos
	Recycling and proper disposal	Camp sites	

Environmental/Social Concern	Parameter	Location	Procedure
<b>Wastewater</b>	Availability and quality of services	Construction sites	Daily checklists
	Abuse of services	Camp sites	Incident reporting
	Disposal		Wastewater register
<b>Water Resources</b>	Shortage of natural water sources due to Project use	Construction site	Daily checklists
	Contamination of potable water	Camp sites	Incident reporting
<b>Maintenance of construction equipment and vehicles</b>	Equipment and vehicles are properly operated maintained	Construction site	Daily checklists
	Leaks and spills of oil, fuel, and lubricant and gas emissions	Equipment storage area	Incident reporting
	Disorderly conduct or misuse of equipment / vehicles	Access roads	
<b>Worker Code of Conduct and Safety</b>	Worker safety	Construction site	Daily safety meetings
	Incidents and accidents	Camp sites	Incident reporting
	Conflict with residents		



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## **7. ENVIRONMENTAL MONITORING FRAMEWORK**

### **7.1 OBJECTIVES**

Independent Environmental Monitoring should be done to ensure compliance and project performance in regard to data gaps identified in the ESIA and to continue baseline data collection, where needed. It is essential to design the monitoring program and monitoring frequency appropriately to be able to demonstrate both the overall performance of the project works, as well as the short-term impact due to peak construction activities. More specifically, as the integral and critical part of the ESMP, the environmental monitoring program should have the following objectives:

- Determine the actual extent of project related environmental and social impacts;
- Control impacts which are generated from construction process as specified in the Environmental and Social Impact Assessment ESIA report(s);
- Check environmental pollution standards applied to the project during construction;
- Check and supervise implementation of environmental protection solutions during construction based on ESIA report;
- Collect additional baseline data, where necessary, to ensure project mitigations are working and effective;
- Suggest mitigation measures in case of unexpected impacts;
- Suggest to the Client to coordinate with central and local environmental organizations to solve pending issues relating to environmental protection under the scope of the Project;
- Assess the effect of mitigation measures in pre-construction, construction and operation stages; and
- Confirm the impacts forecasted in the ESIA, including those impacts which were not predicted.

### **7.2 ROLE OF THE INDEPENDENT ENVIRONMENTAL MONITORING CONSULTANT (IEMC)**

In order to minimize the environmental impacts during construction of the CASA-1000 Project, the PMU shall ensure that Project-specific monitoring requirements are established for the project. The monitoring shall be carried out by an Independent Environmental Monitoring Consultant (IEMC) appointed by PMU.

The IEMC will be responsible for carrying out environmental sampling and monitoring on a quarterly basis for all environmental-related issues regarding construction works. The IEMC will check, review, verify and validate the overall environmental performance of the project through regular inspections and review. This review will provide confirmation that the reported results are valid and that the

relevant mitigation measures and monitoring program provided in the Project ESMP are fully complied with. The IEMC will also supply specialized assistance to PMU and PEO in environmental matters.

During the peak construction period, or at the request of the PMU, the IEMC will also carry out additional measurements using hand-held equipment in order to monitor short-term impact. Once non-compliance with environmental quality performance criteria is identified, additional monitoring will be carried out.

Complete terms of reference for the IEMC are presented in Annex 13.

### **7.3 MONITORING FRAMEWORK**

The Environmental Monitoring Framework will outline the roles and responsibilities of the IEMC during the construction period. Additional monitoring may continue through the operation phase as determined by the PMU.

Objectives of environmental monitoring are as follows:

- To ensure construction activities comply with and adhere to all government regulations and conditions of the ESIA;
- To determine if mitigation measures were successful in reducing potential environmental and social impacts;
- To obtain additional environmental and social baseline data;
- To review feedback on the success of mitigation measures from local communities; and
- To enforce compliance and implement contingency plans where warranted, if proposed mitigation measures are unsuccessful in minimizing or eliminating impacts associated with the Project.

Monitoring during construction of the CASA 1000 project will include the following two activities:

- Measuring the success of the implemented mitigation measures; and
- Collection of data to evaluate environmental conditions before and after construction.

Visual observations, to identify potential environmental and social concerns, in conjunction with checklists are the major component of construction monitoring. Enforcement of government laws and regulations as well as conditions of the ESIA shall also occur during monitoring to ensure compliance. A typical monitoring framework is presented in Table D7-2; a detailed monitoring terms of reference is presented in Annexes.

Table D7-2: Environmental Monitoring Framework- Construction Phase

Environmental/Social Concern	Standard	Frequency	Parameter	Location	Procedure
<b>Noise</b>	ESMP	Daily	Frequency of disturbance to local residents	Construction sites	Auditory or portable noise monitoring equipment
				Settlements in close proximity	Reporting forms Monthly reporting
<b>Dust/Air Quality</b>	ESMP	Monthly	Quantity of dust	Construction sites	Visual
			Need for dust control/ water availability	Access roads Water withdrawal sites	Reporting forms Monthly reporting
<b>Water Quality</b>	ESMP	Weekly	Standard water quality parameters (BOD, pH, COD, TSS, DO, temp., coliforms, etc.)	Water reserves and resources Sewage disposal sites	Water sampling Laboratory testing Monthly reporting
<b>Water Resources</b>	ESMP	Weekly	Construction site, camp site and local demands for potable water	Water reserves and resources Construction and camp sites Local settlements	Consultation with affected residents Monthly reporting
<b>Vegetation Clearing</b>	ESMP	Daily during clearing activities	Clearing boundaries and concerns defined in ESMP	ROW	Visual inspection
<b>Waste Management</b>	ESMP	Daily	Disposal methods	Construction sites Camp sites	Visual inspection

Environmental/Social Concern	Standard	Frequency	Parameter	Location	Procedure
<b>Sedimentation and Erosion</b>		Daily	Degree of erosion and sediments being released by wind or water	Construction sites	Visual inspection
				Camp sites	Daily environmental checklists
				Cleared areas	Monthly reporting
<b>Accidents/Health</b>	ESMP	Daily	Hazardous activities	Construction sites	Daily
			Consultations with local settlements	Camp sites	
			Appropriate safety training	Local settlements	
			Accident reports		
<b>Discovery of cultural or historical significant artifact or site</b>	ESMP	Daily	Article of cultural or historical significance	Excavation sites	Visual
				Borrow sites	Implement Chance Find Procedures
				Construction sites	
<b>Resettlement and land acquisition</b>	LARF	Ongoing during construction	Record of affected people and their new location Relocation compensation	New residence of affected people	Consultation with resettled individuals to ensure success
					Reporting forms
					Database to track resettled people and related social impacts
					Monthly reporting
<b>Site Reclamation</b>	ESMP	Post-construction	Post-construction condition of soils, vegetation, water resources, flora and fauna	Construction sites	Monthly assessments
				Camp sites	Quarterly reporting

## 8. COMMUNICATION AND REPORTING

The following section describes the communication and reporting mechanisms to be implemented as part of the ESMP.

### 8.1 COMMUNICATION PROCESS

Table D8-1 below describes the lines of communication for construction workers, local villagers, local authorities, project organizations and other project-related individuals with respect to filing grievances or incidences throughout the construction and operation of the CASA-1000 Project.

**Table D8-1: Communication Pathways**

Stakeholder	Potential Interest/Concern	Means of Contact	Key Contact
Project Affected Peoples in the Corridor of Interests	Adequate compensation package (financial payment, or equivalent in land or other agreed-to compensation)	Complaints/concerns shall be communicated to local village leaders, through a grievance process.	PEO
	Location of resettled households	Information broadcasts and project updates shall be provided by the Contractor to local authorities	Project Compensation and Resettlement Specialist
	Disturbance from construction camp and associated activities	Grievance process	PEO
	Loss of agriculture lands, trees, fisheries, etc.	Compensation and Land Acquisition Framework	Project Compensation and Resettlement Specialist
	Maintenance of cultural heritage	Cultural Property and Chance Finds Procedures	PEO
	Safety and security of local villagers and communities	Direct contact	PEO
Potential Employees	Employment opportunities (local women and affected households)	Recruitment of locals at the project site and through word of mouth	Contractor

Stakeholder	Potential Interest/Concern	Means of Contact	Key Contact
	Adequate resources (food, water, etc.) and shelter	Issues shall be conveyed to SEO	Contractor
	Competitive wages	SEO or Contractor’s hiring representative	Contractor
Government Stakeholders	Chronic or severe environmental and socio-economic impacts	Bring attention to PEO	PMU
Construction workers and camp sites	Worker code of conduct	Weekly meetings with construction workers	Contractor
	Social conflicts between local villagers and workers	Individual meeting with disorderly workers re: prohibitions – decision on whether removal is necessary	Contractor
	Non-compliance with Project prohibitions established in worker code of conduct (gambling, drugs, etc.)	Individual meeting with disorderly workers re: prohibitions – decision on whether removal is necessary	Contractor
	Environmental issues (exploitation of natural resources, etc.)	Bring attention to PEO	PEO

## 8.2 REPORTING PROCESS

The Supervisory Consultant and the PEO will be responsible for submitting a monthly environmental/ social report on the status and effectiveness of overall environmental and social mitigation and management compliance. Reports shall be produced through the course of implementation of monitoring programs, collecting incident/grievances forms, consulting with local authorities and community representatives and auditing performance of existing programs/mitigation measures within the ESIA and EMP.

Table D8-2 describes the types of reports that shall be prepared.

Table D8-2: Reporting Types CASA 1000 ESMP

Responsibility	Type of Report	Purpose of Reporting	Frequency of Submission	Submit to:
<b>Construction Supervision Engineer (CSE)</b>	Accidents/Incident Report	Filing/notification of accidents or unplanned events.	Within 24 hours of the incident	PEO, copy to contractor
	Non-compliance Report	Detail the cause, nature and effect of any environmental and/or socio-economic non-compliant event and remedial action prescribed.	Within one week of the event	PEO, copy to contractor
	Chance Discovery Report	Documentation and registry of newly discovered artifacts	Within 24 of archaeological site, old human remains or artifact	PEO, copy to contractor, copy to Cultural Authority
	Monthly Compliance Report	Report to the Construction Supervision Team	Report of compliance and non-compliance measures on a monthly basis	PEO
<b>Workplace Safety Environmental Officer (SES)</b>	Daily Compliance Checklist	Checklist of environmental and social compliance of construction	Daily	CSE
	Monthly Compliance Report	Monthly report of compliance within 10 days of receipt of report from Contractor	Monthly	CSE
<b>Project Environmental Officer (PEO)</b>	EMP updates, including any changes in management or monitoring procedures	For approval prior to implementation	As required, prior to implementation	PMU
	Key changes in project activities that may trigger Environmental Approvals	Ensure compliance with environmental regulatory approvals	As required, prior to implementation	PMU
	Environmental monitoring reports	Received from IEMC	Dependent on environmental parameter: weekly, monthly, quarterly or annually	PMU, copy to CSE and Contractor

Responsibility	Type of Report	Purpose of Reporting	Frequency of Submission	Submit to:
	Monthly compliance report	Monthly summary of non-compliances and remedial actions	Monthly	PMU, copy to CSE and Contractor
<b>Construction Contractor</b>	Registers	Develop reporting registers on access roads, waste management, non-compliances and other matters that require ongoing reporting	Ongoing	CSE
	Daily Compliance Report	Walk-around and site inspection to ensure compliance with management sub-plans on a daily basis	Daily	Internal
	Monthly Compliance Report	Monthly summary of non-compliances, remedial actions and observations on management plans	Monthly	CSE, copy to PEO
<b>Social Safeguard Team of PMU</b>	Land Acquisition and Resettlement Framework	Ensure resettled/displaced households transition successfully into resettled sites. Ensure adequate compensation for project related damages or losses	On-going	PEO, PMU
<b>PMU</b>	Quarterly Environmental and Social Performance Report	Summary of environmental and social reports to World Bank and to the IGC in each CASAREM country, or to another appropriate reporting agency	3 times a year	WB and IGC

These reporting requirements are considered to be preliminary and subject to change once the PEO and PMU have been established.

## 9. CAPACITY BUILDING AND TRAINING

A key component of ESMP success depends of effective capacity building of the CASAREM countries, the training of staff and all others involved in the ESMP, including the construction contractor and all sub-consultants. These efforts will also be assisted by the implementation of technical assistance by outside consultants, where required.

All those responsible for the management, implementation and operation of any aspect of the ESMP shall be adequately trained for their role. Training records shall be maintained on site, for each employee, to provide evidence for auditing/inspection purposes.

The following training shall be considered for each organization.

### 9.1 PMU OF THE NATIONAL ELECTRIC BOARD

The PMU is the Executing Agency for CASA 1000 and responsible for day to day supervision and management of all aspects of project preparation and construction, including procurement.

The PMU staff shall be trained in project management and general environmental and social management relating to electrical transmission projects including the following:

- Fundamentals of project management;
- Principles and procedures for environmental impact assessment;
- Fundamentals of environmental management, including the ISO 14000 family;

### PROJECT ENVIRONMENTAL OFFICER

The PEO will be responsible for overall coordination of ESMP implementation. Training should be given to the PEO in the following:

- Fundamentals of environmental management;
- Principles and procedures for environmental impact assessment;
- Project management;
- Compliance assessment, auditing, monitoring and follow-up;
- Construction impacts, including civil works, sediment and erosion control, soil handling and vegetation removal;
- Waste management;
- Fuel and hazardous materials management; and

- Mediation and conflict resolution.

## **9.2 CONSTRUCTION SUPERVISION ENGINEER (CSE) AND WORKPLACE SAFETY AND ENVIRONMENTAL SUPERVISOR (SES)**

The CSE shall be trained in the oversight and compliance assessment of large infrastructure projects, and the preparation of compliance reports and environmental sampling procedures, including the following:

- Principles and procedures for environmental impact assessment;
- Fundamentals of environmental management;
- Compliance assessment, monitoring and follow-up;
- Air, soil and water sampling procedures;
- Construction impacts, including civil works, sediment and erosion control, soil handling and vegetation removal;
- Waste management;
- Fuel and hazardous materials management;
- Construction camp management;
- Community relations and public consultation procedures; and
- Auditing and follow-up.

## **CONSTRUCTION CONTRACTOR AND ON-SITE ENVIRONMENTAL OFFICER (SEO)**

The construction contractor shall have environmental staff trained to ensure contractor and all subcontractor compliance with ESMP requirements. The construction contractor shall maintain training records, including attendance and specific course, for inspection by the PMU and PEO. Specific training to the construction contractor environmental unit should be provided as follows:

- Principles and procedures for environmental impact assessment;
- Fundamentals of environmental management;
- Compliance assessment, monitoring and follow-up;
- Air, soil and water sampling procedures;
- Construction impacts, including civil works, sediment and erosion control, soil handling and vegetation removal;
- Waste management;

- Fuel and hazardous materials management;
- Construction camp management;
- Community relations and public consultation procedures; and
- Auditing and follow-up.

**Technical Assistance**

In addition to staff training, technical assistance for outside consultants should be included into the training budget. Technical assistance could be full-time onsite or include short visits by outside consultants to provide training seminars and workshops.



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## 10. ESMP MONITORING AND REVIEW

The PMU and PEO shall periodically review, monitor and audit the effectiveness of the ESMP within each CASAREM country, including all sub-plans. The audit program should adequately cover the scope, audit frequency and methods that are typically required for large infrastructure projects. The frequency of audits should reflect the intensity of activities (typically more common during construction), severity of environmental and social impacts and non-compliances raised in prior audits.

### 10.1 REVIEW OF THE EMP

The PMU/PEO shall review the ESMP to assess its effectiveness and relevance as follows:

- Within six months of contract award to ensure that all components are being adequately implemented;
- A full review shall be undertaken annually;
- Following a reportable incident, or a significant non-compliance; and
- Following an addition, up-date or change order to the EMP, or a sub-plan.

The review of the ESMP should consider the following:

- Adequacy of data collection, analysis and review;
- Roles and responsibilities are fully understood and being implemented at all levels;
- Reporting procedures;
- Non-compliances and other infractions; and
- Corrective actions implemented.

The ESMP shall also be reviewed periodically to evaluate environmental and social controls and procedures to make sure they are still applicable to the activities being carried out. Reviews will be undertaken by the PMU/PEO as follows:

- Within three months of initiation by the Construction Contractor;
- Full review of the ESMP at least annually;
- Review of relevant parts of the ESMP following a reportable incident;
- Review of relevant parts of the ESMP following the receipt of an updated sub-plan; and
- At the request of stakeholders, local authorities, government regulators and financial institutions.

The review shall include analysis of the data collection and analysis of data, definition of roles and responsibilities, sub plan implementation and feedback, supervision and monitoring reports, incident reports, complaints/grievances and feedback from stakeholders, consultation or community meeting minutes and training records to evaluate the effectiveness of ESMP procedures. Site visits, interviews and other auditing methods may also be used.

## **10.2 CONTROL AND UPDATE OF THE ESMP**

Control and update procedures to the ESMP will be developed by the PEO/PMU in each CASAREM country. The ESMP will be issued as a controlled document to all relevant parties and organizations. The procedure to be followed to control the issue of the documents, provide a review of its effectiveness and provide updates will be as follows:

- Issued copies by the PEO/PMU shall be numbered;
- The PEO/OPMU shall initiate a review of any relevant sections following modification to the ESMP and any sub plan; and
- Upon changes in regulatory procedures by local authorities, or a change to internal procedures based on corrective actions or improvements in methodologies or analytical procedures.

## 11. IMPLEMENTATION PLAN AND SCHEDULE

### 11.1 IMPLEMENTATION

The PMU/PEO shall assume overall responsibility for the implementation of the ESMP as described including the following activities:

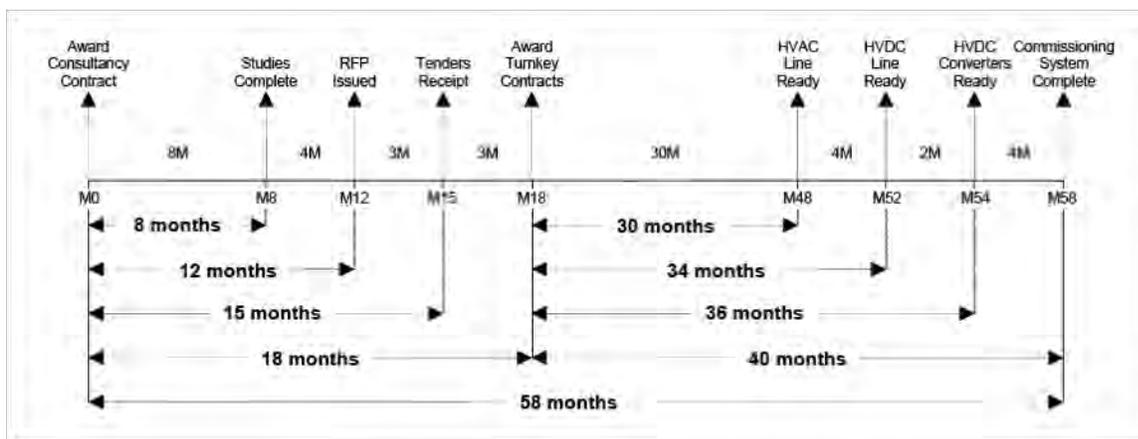
- Oversight of Contractor ESMP requirements and responses;
- Preparation of various management plans;
- Implementation and progress; and
- Training

The PMU/PEO should prepare an implementation plan for the EMP considering the requirements identified in Figure D11-2.

### 11.2 SCHEDULE

A tentative project schedule is provided in Figure D11-1 of the timing for preparation and construction of the CASA 1000 Project.

**Figure D11-1: CASA 1000 Project Schedule Preparation and Construction (SNC 2011)**



The following key milestones are indicated:

- Initial studies and design will be complete 8 months after project initiation;
- Construction RFP will be issued 12 months after project initiation;
- Turnkey construction contract(s) issued 18 months after project initiation;
- HVAC line ready 30 months after onset of construction;

- HVDC line ready 34 months after onset of construction;
- HVDC converters ready 36 months after onset of construction;
- Commissioning system complete 40 months after onset of construction, or 58 month after project initiation.

In regard to the ESMP, the following schedule implications should be considered as shown below and in Figure D11-2:

- 12 months after project initiation
  - Formation of the PMU and environmental/social unit, including the PEO
- 15 months after project initiation
  - Preparation of Aesthetics and Ecological Management Plan and Physical Cultural Property – Chance Finds Management Plan by the PEO/PMU
  - Construction Supervision Engineer selected
  - The Independent Environmental Monitoring Consultant will be selected
- 19 months after project initiation, or 1 month after award of contract
  - Contractor will submit a detailed ESMP Implementation Plan to the PEO/PMU
  - The Contractor shall staff the environmental and social unit
- 20 months after project initiation, or 2 months after award of contract
  - The Construction Contractor will complete the Workforce and Site Installation Management Plan, Site Preparation and Restoration Management Plan, Construction Impact Management Plan, Waste Management Plan, Pollution Prevention Plan, Safety Management Plan and Community Relations and Health Management Plan

Figure D11-2: Preliminary ESMP Schedule

Plan or Activity	Project Phase																			
	Preconstruction								Construction											
	1				2				3				4				5			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Project Initiation																				
Project Studies and Design																				
Award of Construction Contract																				
Formation of PMU/PEO																				
Select CSE																				
PMU Plan Preparation																				
Contractor Submission of ESMP Implementation Plan																				
Contractor Staffs Environmental Unit																				
Contractor Completes ESMP Sub-Plans																				
Contractor Safety Management Plan in Place																				
Review of ESMP Plan Implementation																				
Annual ESMP Review and Reporting																				
Construction Supervision																				
Construction Monitoring																				
ESMP Plan Implementation by Contractor																				
Project Resettlement and Land Acquisition																				
Consultation Guidance Implementation																				
Consultation																				

Table D11-1: ESMP Implementation Plan <sup>65</sup>

Implementation Item	Description	By When
Formation of PMU/PEO Environmental Unit	A Environmental Unit shall be formed to implement the ESMP for the CASA 1000 Project based on: <ul style="list-style-type: none"> <li>Construction supervision</li> <li>Environmental monitoring</li> </ul>	6 months before initiation of preparation of construction site for the main work
Prepare Bid Specifications for Construction Contractor	To prepare environmental and social provisions for inclusion into the contract for the Construction Contractor	Before finalization of any bid process
Contractor Management Plans	The Construction Contractor shall be responsible for in the preparation of the following management plans for approval by the PMU/PEO: <ul style="list-style-type: none"> <li>Workforce and Site Installation Management Plan</li> <li>Site Preparation and</li> </ul>	Before initiation of any construction activity

<sup>65</sup> This is a preliminary schedule that will be finalized after project approval and financing arrangements and selection of the construction contractor

Implementation Item	Description	By When
	<p>Restoration Management Plan</p> <ul style="list-style-type: none"> <li>▪ Construction Impact Management Plan</li> <li>▪ Waste Management Plan</li> <li>▪ Pollution Prevention Plan</li> <li>▪ Safety Management Plan</li> <li>▪ Physical Cultural Property – Chance Finds Management Plan</li> <li>▪ Community Relations and Health Management Plan (jointly with PMU)</li> </ul>	
<b>Contractor Management Plans</b>	<p>The Construction Contractor shall be responsible for in the preparation of the following management plans for approval by the PMU/PEO:</p> <ul style="list-style-type: none"> <li>▪ Workforce and Site Installation Management Plan</li> <li>▪ Site Preparation and Restoration Management Plan</li> <li>▪ Construction Impact Management Plan</li> <li>▪ Waste Management Plan</li> <li>▪ Pollution Prevention Plan</li> <li>▪ Safety Management Plan</li> <li>▪ Physical Cultural Property – Chance Finds Management Plan</li> <li>▪ Community Relations and Health Management Plan (jointly with PMU)</li> </ul>	Before initiation of any construction activity
<b>Preparation of PMU Management Plans</b>	<p>Preparation of the following management plans</p> <ul style="list-style-type: none"> <li>▪ Aesthetics and Environmental Monitoring Plan</li> <li>▪ Environmental Monitoring Plan</li> <li>▪ Health Management Plan (jointly with Contractor)</li> <li>▪ Physical Cultural Resources Management Plan</li> </ul>	2 months before initiation of preparation of construction site for the main project works
<b>Training</b>	<ul style="list-style-type: none"> <li>▪ Develop a training plan outlining training requirements, topics, and areas of capacity building</li> <li>▪ Identify courses/seminars</li> <li>▪ Identify staff requiring training</li> <li>▪ Implement training plan</li> </ul>	Upon project approval

## 12. ESMP COSTS

Estimated costs for the initial implementation of the ESMP are presented below in Table D12-1. Costs have been defined on an initial set up basis and should be regarded as preliminary and subject to change. The PMU/PEO will revise these costs and develop annual operating costs for the ESMP. Costs have been developed on the basis of implementation across all four CASAREM countries.

**Table D12-1: Preliminary Estimate of EMP Costs**

ESMP Component	Estimated Cost (\$US)
Contractor – built into contract	
Supervision – environment – to be built into the contract for Engineering Supervision (includes sampling for environmental quality)	10-25% of engineering supervision cost
Independent Environmental Monitoring (IEMC)	\$200,000
Institutional Strengthening, Training and Capacity Building <sup>66</sup> <ul style="list-style-type: none"> <li>▪ Formation of PMU environmental unit</li> <li>▪ Local authorities, communities and other stakeholders</li> <li>▪ On-site training</li> <li>▪ Offsite training</li> <li>▪ Local capacity building</li> <li>▪ Equipment and logistics</li> </ul>	\$100,000
Chance Finds Procedures and Cultural Property Salvage (including downstream erosion assessment)	\$100,000
Aesthetics and Ecological Management Plan	\$75,000
Community Relations and Regional Health Program	\$100,000
Cumulative Effects Assessment	\$100,000 <sup>67</sup>
<b>Total Initial ESMP Costs</b>	<b>\$675,000.00<sup>68</sup></b>

<sup>66</sup> Costs of salaries, administration and function of the environmental unit paid by PMU

<sup>67</sup> A cumulative effects assessment should be done across all four countries

<sup>68</sup> Note: The ESMP costs do not include costs of environmental supervision which are included in the engineering supervision costs of the project



## 13. ANNEXES

### ANNEX 1: ENVIRONMENTAL AND SOCIAL SPECIFICATIONS FOR CONTRACTORS

This Annex is an overview of the environmental and social specifications that must be included in both the bidding documents and construction contracts to ensure an adequate management of environmental and social issues during all the phases of the CASA-1000 project. The mitigation measures and actions proposed in these specifications will become contractual obligations for Contractors and can be enforced by PMU and PEO. However, this information is intended solely as broad guidance to be used in conjunction with local and national regulations. It will be up to each of the four CASAREM countries through the NEB and financial institutions to incorporate these into legal contract documents.

The Contractor and his employees shall adhere to the mitigation measures set down in:

- The mitigation measures included in project design and bill of quantities;
- General specifications of the Environmental and Social Management Plan; and
- The specifications, procedures, and best practices included in these specifications. These specifications complement any technical specifications included in the work quantities and the requirements of any relevant regulations and standards.

The Annexes that follow provide a framework and overall guidance for the content of specific ESMP management plans to be developed by the Construction Contractor.

Nine specific ESMP implementation plans that shall be submitted by the Contractor(s) as follows:

- Workforce and Site Installation Management Plan
- Site Preparation and Restoration Management Plan
- Construction Impact Management Plan
- Waste Management Plan
- Pollution Prevention Plan
- Aesthetics and Ecological Management Plan
- Safety Management Plan
- Physical Cultural Property – Chance Finds Management Plan
- Community Relations and Health Management Plan

## **ANNEX 2: WORKFORCE AND SITE INSTALLATION MANAGEMENT PLAN**

This Annex deals with the Project Workforce and environmental and social provisions for the installation and operation of worker camps for the CASA 1000 project. Specific components of this Management Plan are as follows:

- General Workforce
- Workers' Camp and Site Installation Requirements
- Sanitary Facilities
- Maintenance of Camp Facilities
- Medical Facilities
- Code of Conduct
- Security
- Prohibitions
- Environmental Training for Construction Workers

### **Construction Workforce**

The Construction Workforce includes all personnel hire by the Contractor and Sub-Contractors on the CASA 1000 Project. Contractors shall provide suitable accommodation, in the form of camps, to those workers who are not considered to be local labor. Workers' camps will be located at appropriate areas away from villages, schools and hospitals, as well as rivers to minimize water course impacts.

The Construction Contractor shall:

- Give priority to hire local labor for construction works;
- Advertise that local labor will be hired from villages located near the project construction front;
- Provide work safety training to those local laborers upon hiring;
- Ensure that the construction workforce have all appropriate training and health and safety certificates as required (for example, health checks, labor contracts, insurance, occupational safety training, etc);
- Provide education and training on HIV and sexually transmitted diseases (see Annex 10 for a more detailed description on this topic);

- 
- Ensure adequate use of resources and proper waste management;
  - Provide transportation in and out of the construction site;
  - Provide high quality accommodation to those workers not considered to be local labor; and
  - Provide appropriate food and refreshment to all workers.

### **Worker Camp and Site Installation Requirements**

Construction camp sites will have to be approved by local authorities. The Contractor shall present the design of all camps, including details of all buildings, facilities and services for approval no later than two months before initiation of any construction work. Approvals and permits shall be obtained in accordance with applicable laws, applicable standards and environmental requirements camp facilities.

The location of construction camps and construction sites will be selected following the criteria below:

- Pre-construction surveys shall be completed including analysis of drainage, soils, vegetative cover, and most importantly, potential environmental and/or social concerns. Steps may vary depending on the region, state, or town, but all sites shall be deemed suitable and approved by authorities so that environmental and social impacts are minimized;
- Site offices, camps, depots, and workshops shall be located in appropriate areas as agreed by local authorities and approved by PEO and not within 1 km of existing residential settlements.
- Camp facilities should not be located in steep slopes or areas subject to erosion;
- The Contractor shall implement effective sediment control measures during construction and operation of construction work camps in accordance with the environmental requirements especially near watercourses;
- Camp areas shall be located to allow effective natural drainage;
- Fuel storage and refueling sites shall not be located, at a minimum, within 100 m of watercourses, and be operated so that no pollutants enter watercourses. Spill kits and adequate training in their use shall be provided;
- All construction camps shall be zoned according to their use. For example, workers' camp zone, canteen, sanitary facilities, offices, etc;
- Construction camps shall not be located in areas with high scenic or aesthetic value;
- The workforce shall be provided with safe, suitable and comfortable accommodation. The camp shall be maintained in clean and sanitary condition;
- In every camp location adequate and suitable facilities for laundry shall be provided and maintained for the use by workers;

- Potable water for human consumption, food preparation and bathing shall be provided at camps, site offices, medical facilities, and other areas. Potable water shall comply with national standards for drinking water quality of the respective CASAREM country;
- The Contractor shall provide recreational facilities to the workforce. Such facilities will help mitigate against potential conflicts and impact on the local population as the incentive to go outside the camp will be reduced; and
- Drainage, wastewater treatment and solid waste disposal of the construction site shall follow national regulations and the mitigation measures presented in the Contractor's Waste Management Plan.

### **Sanitary Facilities**

- The Contractor shall install and maintain a temporary septic tank or a sewage treatment facility which shall be operated so that discharges will not cause pollution of nearby watercourses. Wastewater (both black and grey) shall not be disposed into water bodies without treatment;
- At every camp, separate and adequate lavatory facilities (toilets and washing areas) shall be provided for the use of male and female workers. Toilet facilities should also be provided with adequate supplies running water, soap, and toilet paper. Such facilities shall be conveniently accessible and shall be kept in clean and hygienic conditions;
- Where workers of both sexes are employed, there shall be displayed outside each block of latrine and urinal, a notice in the language understood by the majority of the workers "For Men Only" or "For Women Only" as the case may be;
- Sanitary arrangements, latrines and urinals shall be provided in every work place on the following scale: Where female workers are employed, there shall be at least one latrine for every 25 females or part thereof; Where males are employed, there shall be at least one latrine for every 25 males or part thereof;
- At every construction camp, there must be at least one septic tank. The wastewater from the tank shall not be discharged into any watercourses. The wastewater shall be periodically transported away by a vacuum truck to the nearest treatment plant or an approved municipal sewage treatment facility;
- Sewage treatment facilities shall be designed, installed and operated by the Contractor(s) in accordance with the National Specifications, or World Bank discharge standards.

### **Maintenance of Camp Facilities**

The following measures shall be implemented to ensure that the construction camp and its facilities will be organized and maintained to acceptable and appropriate standards:

- Designated meal times shall be established;

- Lunches, or other meals, shall be provided to workers who are away from the camp site during designated meal times;
- Hot meals and drinks shall be provided during winter or cold weather;
- A kitchen and dining area shall be provided. Cooking or preparation of food shall be prohibited in accommodation quarters;
- Designated rest times shall be established;
- Designated recreational hours shall be established;
- Designated smoking areas shall be established, outside of all buildings and public spaces;
- Procedures to maintain the condition of the construction camp and facilities and ensure adequate cleanliness and hygiene shall be put in place;
- The latrines and urinals shall be adequately lighted and shall be maintained in a clean sanitary condition at all times; and
- Water shall be provided in or near the latrines and urinals by storage in drums or provided by an adequately designed water supply system; and
- A complaint register to receive and respond to complaints from the construction camp residents regarding facilities and services shall be provided.

### **Medical Facilities**

- Medical and first aid facilities shall be provided at each camp area. A First aid box shall be provided at every construction campsite under the charge of a responsible person who shall always be readily available during working hours of the work place. He/she shall be adequately trained in administering first aid-treatment. If there is no ambulance on site, formal arrangement shall be prescribed to make motor transport available to carry injured workers or any person suddenly taken ill to the nearest hospital;
- All consumables as the first aid equipment, cleaning equipment for maintaining hygiene and sanitation should be collected immediately and disposed as below; and
- All medical related waste shall be disposed off in proper containers, or dealt with accordingly with establish procedures for safe disposal.

### **Worker Code of Contact**

A major concern during a construction of the CASA 1000 project is the potentially negative impact of workforce interactions with local communities. For that reason, a Worker Code of Conduct shall be established, outlining appropriate behavior and conduct, prevention of drug and alcohol abuse, and compliance with relevant laws and regulations. Each employee shall be informed of the Worker Code of Conduct and bound by it while in the employment of the Client or its Contractors. The Code of Conduct

shall be available to local communities at the project information centers or other place easily accessible to the communities. The Code of Conduct shall address the following measures (but not limited to them):

- All of the workforce shall abide by the laws and regulations of the respective CASAREM country;
- Illegal substances, weapons and firearms shall be prohibited;
- Pornographic material and gambling shall be prohibited;
- Vehicles shall be parked in designated areas and speed limits established;
- Pets shall be prohibited;
- Workers will not be allowed to hunt or fish while in camp. The keeping or consumption of wild animals shall be prohibited;
- Fighting (physical or verbal) shall be prohibited;
- Smoking shall only be allowed in designated areas;
- Consumption of alcohol shall be prohibited during work hours and a no tolerance policy put in place;
- Maintenance of appropriate standards of dress and personal hygiene shall be put in place;
- Maintenance of appropriate standards hygiene in their accommodation quarters shall be established;
- Proper evacuation procedures and muster areas shall be established in case of fire, or other emergency;
- Creating nuisances and disturbances in or near communities shall be prohibited;
- Disrespecting local customs and traditions shall be prohibited; and
- Workers will be prohibited from visiting local communities.

Failure to comply with the Code of Conduct, or the rules, regulations, and procedures implemented at the construction camp will result in disciplinary action or removal from the workforce.

### **Security**

Security measures shall be put into place to ensure the safe and secure running of the camp and prevent unauthorized entry. These measures shall include, but not be limited to the following:

- Adequate, day-time night-time lighting shall be provided;

- Control of camp access shall be enforced. Access to the camp shall be limited to the residing workforce, construction camp employees, and those visiting personnel on business purposes;
- All visitors will be required to provide proper credentials and their names shall be recorded;
- Prior approval from the construction camp manager for visitor's access to the construction camp shall be required;
- A perimeter security fence shall be provided at least 2m in height constructed from appropriate materials;
- Insect and animal disease vectors shall be adequately controlled;
- Material Safety Data Sheets (MSDS) shall be provided for all chemicals or products stored on site;
- Approved fire extinguishers, or other firefighting materials, shall be provided at strategic locations; and
- An evacuation plan and muster point shall be established in the event of an emergency.

### **Prohibitions**

The following activities shall be prohibited on or near the project site:

- Cutting of trees for any reason outside the approved construction area;
- Hunting, fishing, wildlife capture, or plant collection;
- Buying of wild animals for food;
- Having caged wild animals (especially birds) in camps;
- Poaching of any description;
- Explosive and chemical fishing;
- Use of unapproved toxic materials, including lead-based paints, asbestos, etc.;
- Disturbance to anything with architectural or historical value;
- Building of fires;
- Collection of firewood and use as fuel for cooking or heating in any labor camp or base camp. The Contractor shall provide approved cooking facilities in the kitchen and adequate heating facilities in all camp locations;
- Use of firearms (except authorized security guards);

- Use of alcohol by workers during office or working hours (the Contractor may impose a complete prohibition of alcohol at the work site);
- Washing cars or machinery in streams or creeks;
- Doing maintenance (change of oils and filters) of cars and equipment outside authorized areas;
- Disposing trash in unauthorized places;
- Driving in an unsafe manner in local roads;
- Working without approved personal protective equipment, PPE (including boots and helmets);
- Creating nuisances and disturbances in or near communities;
- The use of rivers and streams for washing clothes, dishes and utensils;
- Indiscriminate disposal of rubbish or construction wastes or rubble;
- Littering the site;
- Spillage of potential pollutants, such as petroleum products;
- Collection of firewood;
- Urinating or defecating outside of designated latrine facilities. Portable latrines shall be provided at all worksites outside of camps; and
- Burning of wastes and/or cleared vegetation.

Any construction worker, office staff, Contractor's employees, the PEO's employee, subcontractors or any other person related to the project found violating these prohibitions will be subject to disciplinary action. This can range from a simple reprimand to termination of his/her employment, depending on the seriousness of the violation.

#### **ENVIRONMENTAL TRAINING FOR CONSTRUCTION WORKERS**

The Contractor shall prepare an Environmental Training Plan for all construction workers and staff to ensure that all concerned staff is aware of the relevant environmental requirements as stipulated in the environmental legislation of the respective country and the Contract specifications. The following provisions shall be implemented:

- The Contractor shall distribute to key staff, including new workers, (1) the Contractor's Environmental Policy; and (2) Copies of relevant extracts from environmental laws, standards and regulations;

- The Contractor is responsible for providing appropriate training to all staff according to their level of responsibility for environmental matters. Managerial staff shall receive additional training;
- The Environmental Policy and all relevant material to the ESMP shall be clearly posted at key locations around the camp;
- All Contractor's employees shall be required to comply with environmental protection procedures and training records shall be kept;
- All training materials and methods -- which shall include formal training sessions, posters, pamphlets or newsletters, signs in construction and camp areas and 'tool box' meetings -- shall be reviewed by the SES and submitted to the PEO for approval;
- The Plan shall educate all construction workers on the following issues but not limited to them: fire arm possession, traffic regulations, illegal logging and collection of non-timber forestry products, non disturbance of resettlement communities, hunting and fishing restrictions, waste management, protection of surface water, erosion control, health and safety issues, all prohibited activities, the Code of Conduct requirements and disciplinary procedures, general information on the environment in which they will be working and living; and establishment of penalties for those who violate the rules;
- All the above materials should be available to local communities upon request;
- Periodic training shall be provided when necessary; and
- Records shall be maintained (e.g. attendance records for environmental awareness training, topics covered) and submitted to the PEO upon request.



### **ANNEX 3: SITE PREPARATION AND RESTORATION MANAGEMENT PLAN**

The Site Preparation and Restoration Management Plan contains provisions for the clearing of construction camps, tower locations and the Right-of-Way as required, timber salvage, revegetation and site restoration and special provisions adjacent to communities and residential areas.

#### **CLEARING OF CONSTRUCTION AREAS AND SALVAGE OF TIMBER**

Areas proposed for clearing shall be approved by the PEO. The Vegetation Clearing Plan shall consider the existing usage of the proposed right-of-way to allow its existing usage to continue as long as is practicable, without interference with the Contractor's activities. Vegetation shall not be disturbed in those areas not submitted with the Plan for non-objection.

Initially, the right-of-way (ROW) shall be cleared of trees and vegetation to provide the necessary access for construction equipment and a safe work area for crews. Clearing of the ROW and tower locations ensures an environment that safely and reliably supports the construction and ongoing operation of the transmission lines.

The Contractor shall:

- Identify vegetation to be preserved during the planning process. Vegetation to be preserved should be delineated in the field with temporary construction fencing or marking. Preserving natural vegetation provides buffer zones and stabilized areas, which help control erosion, protect water quality, and enhance aesthetic benefits;
- Clear the right -of -way (ROW) of trees and vegetation to provide the necessary access to construction, operation and maintenance equipment and a safe work area for crews;
- All felled trees deemed to have economic value to individuals or communities shall be adequately compensated, according to established compensatory procedures. This shall be established by the PEO in conjunction with local authorities and the project Land Acquisition Framework;
- Use “brush rakes” of bulldozers to minimize disturbance of ground cover. Save as much vegetation as possible;
- When determining the time and method of clearing, consider soil stability, the protection of natural vegetation, the protection of adjacent resources (such as wildlife habitat) and the prevention of siltation of water courses;
- Avoid burning of removed vegetation. Dispose removed vegetation to designated areas;
- Encourage local people to make use of removed vegetation such as composting in gardens;
- Clear vegetation in a phased manner in order to retain vegetation cover for as long as possible and prevent large areas from becoming exposed to wind and get eroded;

- Stockpile all indigenous plant material removed from cleared areas to be used later in restoration. All remaining non-indigenous vegetation shall be removed and disposed of at an approved landfill site;
- Remove topsoil from all areas where topsoil will be impacted on by construction activities, including temporary activities such as storage and stockpiling, etc. Stripped topsoil shall be stockpiled in areas agreed with the PEO for later use in re-vegetation and shall be adequately protected from wind and water erosion and toxic materials;
- Remove or cut down trees that could become tall enough to grow or fall into high voltage transmission lines to prevent flashovers that might result in outages and fires. Trees and shrubs that do not represent any danger to the transmission lines shall not be cut or removed;
- When the ROW crosses major highways and rivers, leave a screen of natural vegetation on each side of the road or river. If natural vegetation is such that a screen cannot be left, consider planting native types of plants and low-growing trees to provide a screen or visual barrier;
- When clearing cannot be avoided adjacent to residences, orchards, or other sensitive areas with high exposure to public view, perform it in a manner which will minimize visual impact;
- When clearing within 30 m of permanent streams or 15 m of intermittent streams, the Contractor shall use hand cutting or winching to remove timber;
- Provide a plan for timber salvage indicating type of timber to be salvaged, methods of storage, and transportation and use of timber;
- In artificial forests, trees shall be cut properly in accordance with the agreement with the affected owners and the timber deposited where the owner indicates within the premises;
- Selectively cut vegetation and restrict grubbing in steep slopes, erosion-prone soils, and ecologically sensitive areas;
- Large or significant trees in camp areas and access roads should be preserved wherever possible;
- Minimize the application of chemicals for vegetation clearing. To the extent possible, non-residual chemicals shall be selected and with negligible adverse effects on human health; all chemicals need to be approved by the PEO;
- Herbicides use in the project shall be approved by the PEO and shown to be effective against the target vegetation, have minimum effect on the natural environment, and be demonstrated to be safe for inhabitants and domestic animals in the treated areas, as well for personnel applying them;
- Rapid re-growth trees shall be cut to a height of 30 cm and the stumps treated with authorized herbicide products to prevent re-growth within a range of 30 m on both sides of the axis of the ROW;

- The Contractor shall replace at his/her own cost damaged or destroyed vegetation outside the areas approved for clearing.

### **RE-VEGETATION AND SITE RESTORATION**

- Re-vegetation shall start at the earliest opportunity. Appropriate local native species of vegetation shall be selected for the compensatory planting and restoration of natural landforms;
- Appropriate grass, or other erosion control material (such as jute) should be planted in high embankment slopes to recover vegetable cover and protect from erosion;
- Restoration of cleared areas such disposal areas, site facilities, workers' camps, stockpiles areas, working platforms and any areas temporarily occupied during construction of the project works shall be accomplished using landscaping, adequate drainage and re-vegetation;
- The Contractor shall use mulch, blankets and mats, along with native grass seeds, in situations when disturbed soil is difficult to stabilize such as bare or exposed soil, steep slopes, (generally steeper than 1:3), slopes where the erosion potential is high, disturbed areas where plants are slow to develop, channels with flows exceeding 1 m/second, stockpiles and slopes adjacent to water bodies and other sensitive resources.
- Spoil heaps and excavated slopes shall be re-profiled to stabilized and cover established to prevent erosion;
- Restoration and re-vegetation shall be carried out timely for on exposed slopes/soils and finished areas shall be reinstated in order to achieve the stability of slopes and maintain soil integrity;
- All affected areas shall be landscaped and any necessary remedial works shall be undertaken without delay, including grassing and reforestation;
- Water courses and sites should be cleared of debris and drains and culverts checked for clear flow paths. Debris and all excess material shall be properly disposed; and
- Under no circumstances shall the Right-of-Way be allowed for permanent vehicle access.

### **RESIDENTIAL AREAS AND COMMUNITIES**

Construction near residential areas requires special precautions to minimize disturbance to residences and maximize safety considerations. Impacts to residences near construction sites will be minimized by implementing the following applicable mitigation measures:

- Residences or other major or inhabited buildings within the right-of-way will require removal to comply with electrical safety codes that restrict residential uses within the transmission line right-of-way;
- Strip and store, and replace topsoil after construction;

- Apply erosion, sedimentation, dust and noise control measures (refer to Construction Impact Management Plan as many of the mitigation measures discussed there are applicable to residential areas);
- Install a visible safety fence (orange or other color) between the construction area and residences;
- Avoid removal of trees and vegetation wherever possible adjacent to residential area;
- Maintain access to residences at all times during construction;
- Notify residences within 48 hours of start of construction and construction during nighttime hours. Review permits for additional requirements for nighttime construction;
- Restoration of residential areas must be initiated within 24 hours of completion of construction. All disturbed areas must be graded to pre-construction contours. Topsoil (either segregated and replaced, or newly imported) must be placed and raked smooth;
- The disturbed areas must be reseeded or re-sodded according to landowner requests; and
- All ornamental shrubs and other landscaping must be restored in accordance with the landowner's request, or compensate the landowner in an agreed amount or replace damaged landscaping. Restoration work should be performed Contractor's personnel familiar with local horticultural and turf establishment practices.

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## **ANNEX 4: CONSTRUCTION IMPACT MANAGEMENT PLAN**

The Construction Impact Management Plan details procedures to minimize construction impacts relating to the following:

- New and Existing Access Roads
- Substations
- Erosion and Sedimentation Control
- Emissions and Dust
- Noise Control
- Earthworks, Cuts and Fill Slopes
- Stockpiles, Quarries and Borrow Pits
- Soil Compaction

### **NEW AND EXISTING ACCESS ROADS**

Access roads are temporary or permanent roads that provide safe, fixed routes of travel for moving equipment and supplies. Construction of these roads represents one of the largest land disturbance activities associated with construction and maintenance of transmission lines. To minimize the impact of access road on the environment, the following measures should be put into place;

- The Contractor shall provide an Access Management Plan that establishes an access road register of all new access roads, existing access roads and those subject to widening or modification, including a plan for restoration of all access roads after construction, unless agreed to by local communities;
- To the extent possible, the Contractor shall try to use the existing local roads, to reduce the construction of new access roads;
- When a Contractor proposes a new road, the PMU, and PEO shall give their no objection. A road engineer has to corroborate that the proposed access road is properly designed and the road shall be added to the access road register;
- The Contractor has to present a 1:5000 scale map of the road;
- The design of the new access road shall follow the landform and avoid alignments that require large volumes of excavation.
- In areas with steep slopes, the width of the road cannot exceed 3.5 m. In general, access roads should not be more than 6 m wide;

- The new access road shall include a drainage ditch and all unstable slopes shall include retaining walls or other appropriate structures to control erosion and landslides;
- New access roads shall avoid areas of high scenic value, and protected and sensitive areas;
- Access roads should avoid agricultural areas where reasonable and practical;
- The Contractor shall avoid road construction on unstable slopes;
- The Contractor shall improve existing low-standard roads, which will be used for future access for the operation and maintenance of the transmission line;
- Night construction activities near sensitive receptors such as residential areas, hospitals, rest homes, etc. shall be prohibited;
- The Contractor shall set all necessary warning signs, and speed bumps near sensitive receptors to reduce speed and increase traffic safety;
- For unpaved access roads, the Contractor shall spray water 2-3 times a day during the dry season to reduce the production of dust;
- If temporary bridges are needed, their design shall be reviewed by a licensed engineer and approved by the PEO. These bridges can be fabricated from locally available materials, or the Contractor can use pre-fabricated bridges if available. All temporary bridges shall be removed after construction is concluded;
- Once the construction of the transmission line is finished, all access roads will be either given back to local governments/communities or decommissioned, and the area re-stored to its pre-construction condition, or used as access for maintenance of the transmission line; and
- In access roads adjacent to communities, the Contractor shall inform local communities of traffic patterns and usage and provide education materials to schools to inform children about traffic safety.

## **SUBSTATIONS**

Substations are an assemblage of equipment within a fenced area that switch, change, or regulate voltage in electric transmission and distribution systems used to transform high voltage for safe delivery of electricity to homes and businesses.

Substation construction requires stripping of topsoil, excavation of additional material, and placement of impervious surfaces which all aid in the transport of sediment-laden storm water.

To reduce impacts on the environment caused by substations, the Contractor shall:

- Undertake a preconstruction survey of proposed substation locations to minimize any environmental or social impact;
- Avoid agricultural land wherever possible;
- Put into place a spill prevention control and countermeasure plan to ensure that hazardous spills don't contaminate the land and water courses (for more detailed description on hazardous spills, refer to Hazardous and Chemical Waste Management Plan );
- Install storm water treatment systems, such as retention ponds or infiltration basins, in sites two ha in size or greater;
- If required, put into place erosion control measures (for more detail see Erosion and Sedimentation Control, below);
- Implement noise and dust control measures (for more information see Emission and Dust and Noise Control below); and
- After completion of works, landscape adjacent areas with native vegetation (for more detail refer to Re-vegetation and Restoration Management Plan).

#### **EROSION AND SEDIMENTATION CONTROL**

There is the potential for site erosion and sedimentation of nearby land, lakes, streams, and wetlands if the site activities are not carefully managed. Transported soil or subsoil has the potential for significant impacts on aquatic ecosystems.

In order to avoid negative impacts in the project area, the Contractor shall carry out the following activities:

- The Contractor shall protect all areas susceptible to erosion by installing necessary temporary and permanent drainage works as soon as possible and by taking any other measures necessary to prevent storm water from concentrating in streams and scouring slopes, banks, etc.;
- Implement terraces and other erosion control measures where necessary to prevent soil erosion along the ROW;
- Areas of the site not disturbed by construction activities shall be maintained in their existing condition;
- As a general rule, do not machine clear (bulldozer) on slopes exceeding 35%;

- Preserve as much vegetation as possible. Preserving vegetation is beneficial in the following areas: floodplains, buffers, wetlands, stream banks, steep slopes, and other sensitive resource areas where it might be difficult to establish, install, or maintain erosion control devices;
- Disturb as little ground area as possible, stabilize that area as quickly as possible, control drainage through the area, and trap sediment onsite. Erect erosion control barriers around perimeter of cuts, disposal pits, and access roads;
- Reduce water speed and volume by increasing the number of drainage culverts and selecting proper places for culvert placement to avoid erosion effects;
- Conserve topsoil with its leaf litter and organic matter, and reapply this material to local disturbed areas to promote the growth of local native vegetation;
- Apply local, native grass seed and mulch to barren erosive soil areas or closed construction surfaces;
- Apply erosion control measures before the rainy season begins preferably immediately following construction. Install erosion control measures as each construction site is completed;
- Install slope breakers such as silt fences, staked hay or straw bales, or sand bags to reduce runoff velocity and divert water off the construction ROW. Slope breakers must be installed on slopes greater than 5 percent where the base of the slope is less than 15 m (50 ft) from water bodies, wetlands, and road crossings;
- Install sediment control structures where needed to slow or redirect runoff and trap sediment until vegetation is established. Sediment control structures include windrows of slash, rock berms, sediment catchment basins, straw bales, brush fences, silt fences and silt curtains, fiber rolls, etc;
- In areas where construction activities have been completed and where no further disturbance would take place, re-vegetation should commence as soon as possible;
- Spray water as needed on unpaved roads, cuts, fill material and stockpiled soil to reduce wind-induced erosion;
- Traffic and movement over stabilized areas shall be restricted and controlled, and damage to stabilized areas shall be repaired and maintained to the satisfaction of the SES and PEO;
- Slope works and earth moving/excavation shall be conducted in order to minimize exposure of soil surface both in terms of area and duration. Temporary soil erosion control and slope protection works shall be carried out in sequence to the construction; and
- Exposed soil and material stockpiles shall be protected against wind erosion and the location of stockpiles shall take into consideration the prevailing wind directions and locations of sensitive receptors.

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## AIR EMISSIONS AND DUST

Sources of air pollution during construction that can be a nuisance and cause health problems are:

- Fugitive dust emissions due to exposure of slope surface, uncovered stockpiling area, earth moving and excavation activities;
- Dust due to blasting;
- Dust from vehicles and unpaved roads;
- Dust from construction equipment; and
- Air pollutant emissions from exhaust of construction plant and vehicles such as CO, CO<sub>2</sub>, NO<sub>x</sub>, and SO<sub>2</sub>.

In order to ensure that dust generation due to the construction activities is minimized, the following activities should be put into place:

- The Contractor shall be responsible for compliance with relevant legislation with respect to ambient air quality;
- The Contractor shall ensure that dust generation is minimized and shall implement a dust control program to maintain a safe working environment, minimize nuisance for surrounding residential areas / dwellings, and vulnerable people (children, elders) and protect damage to natural vegetation, crops, etc.;
- The Contractor shall implement dust suppression measures (e.g. water spray vehicles, covering of material stockpiles, etc.) if and when required;
- Watering of roads shall be carried out on dry and windy days, at least twice a day (morning and afternoon). The frequency of water spray near local communities shall be increased as may be needed. Removal of water for road spraying shall not conflict with local water uses;
- Construction vehicles that generate serious air pollution and those which are poorly maintained shall not be allowed at construction sites;
- Exhaust gases from construction machinery and vehicles shall comply with local or other applicable standards and regulations. Construction machinery shall be inspected and adjusted as required to minimize pollution levels;
- Trucks transporting loose materials such as cement, sand, and lime shall be properly covered and secured during transportation to prevent unnecessary emissions; and
- In case blasting is required during the construction activities, water shall be sprayed on the surface of the blast area to increase its moisture content, wire mesh gunny sacks and sandbags shall be used

on top of the blast area at each shot to prevent flying rocks and dust. Blasting shall not be carried out under adverse weather conditions.

## **NOISE CONTROL**

Construction equipment will be the primary noise source during construction of CASA 1000 Project. Clearing, grading, tower erection and conductor stringing all require use of heavy equipment generating noise during working hours. Construction of access roads and bridges may also require large equipment typical of a highway construction project. Under certain weather conditions, line operation can generate audible noise (crackling) along the right-of-way (ROW).

To minimize noise during construction, the following measures shall be put into place:

- The Contractor shall be responsible for compliance with relevant legislation with respect to noise and noise levels;
- If there are schools near the construction area, high-noise construction equipment should be used preferably after school classes. If such an arrangement is not feasible, the use of such equipment shall be kept to a minimum, and the contractors shall be required to provide advanced warning to the schools or develop other possible solutions;
- In sensitive areas (for example, hospitals, rest homes, etc.), construction activity shall be scheduled in daytime only, and the noisy equipment shall be prohibited from night operation (including blasting);
- The Contractor shall schedule the construction activities to avoid the breeding season of sensitive wildlife or wildlife protected by the government;
- The Contractor shall notify residences within 48 hours of any construction activity during nighttime hours. The Contractor shall comply with any relevant requirements for nighttime construction;
- Concreted mixers, power generated and other stationary equipment shall be carefully placed as far away from local communities to reduce noise impacts from these machines. Where possible, municipal power supply shall be utilized in construction including night time construction as diesel generators are extremely noisy and avoiding their use is the best mitigation possible;
- The transportation schedule shall be carefully designed to minimize the adverse impact on residents and students as well as the traffic on the existing road. The transportation vehicles will be required to slow down when passing townships and nearby schools. Transportation during peak hours should be minimized;
- The construction equipment shall be well maintained to keep it best operating conditions and lowest noise levels possible. Properly designed silencers, mufflers, acoustically dampened panels and acoustic sheds or shields, etc shall be used during construction. Mufflers and other noise control devices shall be repaired or replaced if defective; and

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- Hearing protection shall be provided for workers who must work with high noise sources such as piling, explosion, construction machinery, cement mixing and other construction equipment.

### **EARTHWORKS, CUTS AND FILL SLOPES**

Earthworks, cuts and fill slopes shall be carefully managed to minimize negative impacts on the environment through the following measures:

- The Contractor shall maintain stable cut and fill slopes at all times and cause the least possible disturbance to areas outside the prescribed limits of the construction works;
- All earthworks shall be properly controlled, especially during the rainy season;
- The Contractor shall complete cut and fill operations to final cross-sections at any one location as soon as possible and preferably in one continuous operation to avoid partially completed earthworks, especially during the rainy season;
- In order to protect any cut or fill slopes from erosion, in accordance with engineering drawings, cut off drains and toe-drains shall be provided at the top and bottom of slopes and be planted with grass or other cover. Cut off drains should be provided above high cuts to minimize water runoff and slope erosion;
- Any excavated cut or unsuitable material shall be disposed of in designated disposal areas as agreed to by the SES and PEO;
- Spoil disposal sites should not be located where they can cause future slides, interfere with agricultural land or any other properties, or cause soil from the dump to be washed into any watercourse. Drains may need to be dug within and around the tips, as directed by the SEO or SES and to the satisfaction of the PEO.

### **STOCKPILES, QUARRIES AND BORROW PITS**

In case that borrow pits and quarries are needed during the construction of access roads, the Contractor shall carry out the following activities:

- Locations of stockpiles, quarries and borrow pits shall be identified and demarcated, ensuring that they are a minimum of 25m from critical areas such as steep slopes, erosion-prone soils, cultivated lands, and areas that drain directly into water bodies. Locations of stockpiles, quarries and borrow pits shall be in non-productive land to the maximum extent possible and be approved by the PEO;
- Location of stockpiles, quarries, and borrow pits shall avoid sensitive areas such as nature reserves, protected areas, areas of high ecological value, scenic areas, forest parks, water source protection areas, etc.;
- Limit extraction of material to approved and demarcated quarries and borrow pits;

- Stockpile topsoil when first opening the borrow pit. After all usable borrow has been removed, the previously stockpiled topsoil should be spread back over the borrow area and graded to a smooth, uniform surface, sloped to drain and re-vegetated. On steep slopes, benches or terraces may have to be established to help control erosion;
- Excess overburden should be stabilized and re-vegetated. Where appropriate, organic debris and overburden should be spread over the disturbed site to promote re-vegetation. Natural re-vegetation is preferred to the extent practicable;
- Existing drainage channels in areas affected by the operation should be kept free of overburden;
- The Contractor shall ensure that all borrow pits used are left in a trim and tidy condition with stable side slopes, re-establishment of vegetation, restoration of natural water courses, avoidance of flooding of the excavated areas wherever possible so no stagnant water bodies are created which could breed mosquitoes;
- When borrow pits cannot be refilled or reasonably drained, the Contractor shall consult with the local community to determine their preference for reuse such as fish farming, stock water ponds or other community purposes;
- No foreign material generated/ deposited during construction shall remain on site; and
- Areas affected by stockpiling shall be reinstated to the satisfaction of the SES and PEO.

#### **SOIL COMPACTION**

The Contractor shall present to the PMU and PEO the measures to be taken to minimize soil compaction during construction, maintenance and operation of CASA 1000 Project. In general, the Contractor shall:

- Stop construction where excessively wet conditions will result in soil compaction;
- Minimize and control vehicle movement on the ROW to minimize soil compaction;
- Following construction, disc or furrow the disturbed land and cultivated areas to produce a roughened surface and friable rooting medium. Substations in particular may require remedial actions;
- When appropriate, alleviate subsoil compaction;
- Avoid using heavy equipment except in access roads and areas that will be restored to their original conditions; and
- Use deep plowing and disking equipment on highly compacted soils at the construction site.

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## **ANNEX 5: WASTE MANAGEMENT PLAN**

During the construction stage, the Contractor shall prepare a Waste Management Plan before commencement of project works. The Plan shall include the following Sub-Plans:

### **SITE DRAINAGE AND RUNOFF CONTROL**

For all facilities requiring drainage, a Site Drainage Sub-Plan shall be developed containing the following:

- A review of the preliminary site drainage design prepared during detailed design;
- An update of the preliminary design based on the actual construction program and the site specific conditions (e.g. the geographical conditions, location of slopes and the nature of construction work);
- A detailed implementation program, approved by local authorities or irrigation engineers;
- Detailed design including drawings, location maps, specifications of drainage collection channels, pumping systems, temporary water pipes, and wastewater treatment facilities;
- Proposed discharge locations and treatment standards; and
- As part of the design of the site drainage system, surface runoff within the construction site shall be diverted in order to avoid flushing away soil material and the water is treated by device such as sediment trap before discharge;

### **WASTEWATER**

- The Contractor shall be responsible for compliance with the relevant national legislation related to wastewater discharges into watercourses;
- The Contractor shall submit a method statement to the PEO detailing how wastewater would be collected from all wastewater generating areas, as well as storage and disposal methods. If the Contractor intends to carry out any on-site wastewater treatment, this should also be included;
- Runoff from fuel depots / workshops / machinery washing etc, shall be collected into a holding tank, or suitable lined pond, tested and then disposed off site as approved by the SES or PEO;
- Domestic sewage from site office and toilets shall either be collected by a licensed waste collector or treated by on-site treatment facilities. Discharge of treated wastewater must comply with the discharge limits according to relevant national legislation;
- Chemical toilets can be provided on site for construction workers. Domestic sewage collected from the site office and chemical toilets shall be cleaned up on regular basis. Only licensed waste collectors shall be employed for this disposal;

- At completion of construction works, soak pits and septic tanks shall be covered and effectively sealed off; and
- Wastewater shall not be disposed in watercourses without treatment.

#### **SOLID WASTE**

- The Contractor shall submit a method statement detailing a solid waste control plan (storage, provision of bins, site clean-up schedule, bin clean-out schedule, etc.) to the PEO for approval.
- The Contractor shall ensure that all construction facilities are maintained in a neat and tidy condition and sites shall be kept free of litter (garbage);
- Measures shall be taken to reduce the potential for litter and negligent behavior with regard to the disposal of all refuse. At all places of work, the Contractor shall provide litter bins, containers and refuse collection facilities for later disposal;
- Solid waste may be temporarily stored on site in a designated area approved by the SES prior to collection and disposal through a licensed waste collector;
- Waste storage containers shall be covered, tip-proof, weatherproof and scavenger proof. The waste storage area shall be fenced off to prevent wind-blown litter;
- No burning, on-site burying or dumping of waste shall occur;
- All solid waste shall be disposed of offsite at an approved disposal site. The Contractor shall supply the SES and PEO with certificates of disposal;
- Random disposal of solid waste in scenery areas shall be strictly prohibited;
- The Contractor shall identify and demarcate disposal areas clearly indicating the specific materials that can be deposited in each; and
- Recyclable materials such as wooden plates for trench works, steel, scaffolding material, site holding, packaging material, etc shall be collected and separated on-site from other waste sources. Collected recyclable material shall be re-used for other projects or sold to waste collector for recycling.

#### **DOMESTIC WASTE**

- The Contractor shall provide refuse bins, all with lids, for all buildings and construction sites;
- Refuse shall be collected and removed from all facilities at least twice per week;
- A waste register should be developed to track all waste volumes;

- Domestic waste shall be transported to an approved refuse disposal site in covered containers or trucks; and
- Collection and disposal of domestic waste shall be coordinated with local authorities.

#### **HAZARDOUS AND CHEMICAL WASTE**

- All hazardous and chemical waste shall be disposed of at an approved hazardous landfill site and in accordance with local legislative requirements. The Contractor shall provide disposal manifests to the PEO;
- The removal of hazardous and chemical waste shall be performed and disposed of by specially trained workers. Proper training and Personal Protective Equipment (PPE) shall be provided for this purpose;
- Used oil and grease shall be removed from site and sold to an approved used oil recycling facility;
- Under no circumstances shall the disposal of tar or hydrocarbon products be allowed on the site, over embankments, in borrow pits or any burying;
- Unused or rejected tar or hydrocarbon products shall be returned to the supplier's production plant;
- Used oil, lubricants, cleaning materials, etc. from the maintenance of vehicles and machinery shall be collected in holding tanks and sent back to the supplier or removed from site by a specialist oil recycling company for disposal at an approved hazardous waste site;
- Soil contaminated with chemicals or hazardous substances shall be removed and transported and buried in approved waste disposal areas for this purpose;
- Inform the SES and SEO of any accidental spill or incident;
- Initiate a remedial action following any spill or incident; and
- Provide a report explaining the reasons for the spill or incident, remedial action taken, consequences/damage from the spill, and proposed corrective actions.



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## ANNEX 6: POLLUTION PREVENTION PLAN

### MAINTENANCE DURING CONSTRUCTION

The Contractor shall keep all CASA 1000 Project work sites clean carrying out the following activities:

- Establish and enforce daily site clean-up procedures, including maintenance of adequate disposal facilities for debris;
- Trash and debris shall not be buried within fill or backfill areas;
- Collect construction, demolition, clearing, grubbing debris, and other trash weekly for disposal off-site. No on-site burning shall be permitted;
- The disposal of construction debris shall be carried out only at sites identified and approved by the SES and PEO. The contractor should ensure that these sites (a) are not located within designated forest or cultivated areas; (b) do not impact natural drainage courses; and (c) do not impact endangered/rare flora. Under no circumstances shall the contractor dispose of any material in environmentally sensitive areas;
- Maintain silt fence and other temporary erosion and sediment controls in working order throughout the project;
- In the event any debris or silt from the sites is deposited on adjacent land, the Contractor shall immediately remove such debris or silt and restore the affected area to its original state to the satisfaction of the SES;
- Excess sediment behind silt fences and Bio Rolls shall be removed and properly disposed when sediments reach one-third the height of the structure;
- Construction entrances/exits shall be maintained daily;
- Remove all remaining temporary and accumulated silt fences 30 days after site has undergone final stabilization;
- Water courses, drains and culverts shall be cleared of debris and checked for clear flow paths;
- Include provisions for incorporating the most appropriate stabilization techniques for each disposal site and determine that the selected spoil disposal sites do not cause unwanted surface drainage;
- Assess risk of any potential impact regarding leaching of spoil material on surface water; and
- Once the job is completed, all construction -generated debris should be removed from the site.

## **MAINTENANCE OF CONSTRUCTION EQUIPMENT**

The Contractor shall:

- Identify and demarcate equipment maintenance areas (> 100 m from rivers, streams, lakes or wetlands). Fuel storage shall be located in proper areas and approved by SES or PEO;
- Take appropriate spill prevention precaution procedures where conditions require construction equipment (e.g., barge mounted backhoes, trench dewatering pumps) be refueled within 100 m of water bodies;
- Ensure that all instruments, machines, and construction equipment meet quality standards before they are put into use;
- Ensure that all equipment maintenance activities, including oil changes, are conducted within demarcated maintenance areas; never dispose spent oils on the ground, in water courses, drainage canals or in sewer systems. Waste oils shall be disposed in facilities approved by the SES or PEO;
- All spills and collected petroleum products shall be disposed of in accordance with standard environmental procedures/guidelines; and
- Fuel storage and refilling areas shall be located at least 100 m from all cross drainage structures and important water bodies or as directed by SES or PEO.

## **MATERIAL TRANSPORTATION AND STORAGE**

Environmental considerations shall be taken into account in the site selection and location of any material storage areas.

## **TRANSPORTATION**

- The Contractor shall ensure that all suppliers and their delivery drivers are aware of procedures and restrictions (e.g. restricted areas);
- A manifest system shall be implemented to ensure that delivery occurs to the intended location;
- Material shall be appropriately secured in vehicles to ensure safe passage between destinations during transportation;
- Loads shall have an appropriate cover to prevent them spilling from the vehicle during transit;
- The Contractor shall be responsible for any clean-up resulting from the failure by his employees or suppliers to properly secure transported materials; and
- Transportation of hazardous and chemical substances shall be carried out in strong leak-free containers.

**HAZARDOUS AND CHEMICAL SUBSTANCES**

The Contractor shall provide a method statement detailing the hazardous substances / material that are to be used during construction, as well as the storage, handling, and disposal procedures for each substance / material. Emergency procedures in the event of misuse or spillage that might negatively affect the environment shall also be provided in the method statement. In general terms, the following activities shall be carried out:

- The Hazardous Waste Management Plan shall be made available to all persons involved in operations and transport activities. Training on the Waste Management Plan shall be provided;
- All hazardous material / substances (e.g. petrochemicals, oils, etc.) shall be stored on site only under controlled conditions;
- All hazardous material / substances shall be stored in a secured, appointed area that is fenced and has restricted entry. All storage shall take place using suitable containers to the approval of the SES and PEO;
- The Contractor shall not store hazardous materials, chemicals, fuels, lubricating oils, pesticides, herbicides, or perform concrete coating activities within 100 m of streams, watercourses or within municipal watershed areas (except at locations within these areas that are designated for these purposes by an appropriate governmental authority);
- Hazard signs indicating the nature of the stored materials shall be displayed on the storage facility or containment structure. Material Safety Data Sheets of all hazardous materials on site shall be readily available;
- Fuel shall be stored in a steel tank supplied and maintained by the fuel suppliers. The tank shall be located in a secure, demarcated area;
- Herbicides shall be appropriately packaged, labeled, handled, stored, disposed of, and applied according to national standards; and
- Personnel shall be required to wear appropriate personal protective equipment (PPE) and respirators when working with hazardous or chemical substances. All personnel shall be trained in handling procedures and cautions with respect to hazardous substances.



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## ANNEX 7: AESTHETICS AND ECOLOGICAL MANAGEMENT PLAN

The Aesthetics and Ecological Management Plan considers measures that will be put in place to protect landscape and scenic views, native flora and fauna, agricultural or pastoral lands, watercourses, wetlands and forested lands.

### AESTHETICS AND LANDSCAPE MANAGEMENT

The design, location construction, and ROW management can mitigate some of the adverse aesthetic effects of a line. It is in the interest of the applicants and the affected landowners to discuss these measures early on during the planning and design process.

To minimize aesthetic impact of the transmission lines on scenic views and sensitive areas, the Contractor shall:

- When feasible, consider re-routing the transmission line and/or access roads in order to avoid areas with high scenic value;
- Locate towers to maximize the screening effect of existing topography and vegetation wherever possible;
- Where transmission lines cross major highways and rivers, locate transmission lines strategically to minimize visibility and surface disturbance;
- At road crossings of two or more circuits, where only a portion of the line is visible from the highway, consider using multiple circuit towers to minimize the visual impact of the line at that point;
- Locate towers at least 15 m (50 ft) from public roads;
- Use high strength conductors particularly at scenic views, ravines, and valley crossings to pick up the line sag and allow for straighter line profiles;
- Consider the use of helicopters for construction of ROW in mountainous or otherwise inaccessible terrain and areas with scenic or historic, aesthetic or cultural significance;
- In scenic or ecologically sensitive areas, consider tension stringing of conductors to reduce vegetation clearing;
- Wherever possible, consider routing the proposed transmission line parallel to an existing transmission line ROW to reduce visual impacts;
- Mitigate aesthetic impacts caused by the ROW by: planting vegetative screens to block views of the line, leaving the ROW in a natural state at road crossings, creating curved or wavy ROW boundaries; and

- In areas of forested or wildlife habitat, consider pruning trees to create a feathered effect, and screening and piling brush from the cleared ROW so that it provides wildlife habitat.

## **FLORA AND FAUNA**

Construction and maintenance of transmission lines may destroy individual plants and animals or alter their habitat so that it becomes unsuitable for them. For example, trees used by rare birds for nesting may be cut down or soil erosion may degrade rivers and wetlands that provide required aquatic habitat.

Impacts to rare and protected species can usually be avoided or minimized by redesigning or relocating the transmission line. When rare plants or animals are known to be present in the project area, the area shall be surveyed in order to identify the exact location of species and mitigation measures shall be put into place. These measures may include the modification of the route, special construction techniques, or limiting construction time to specific seasons.

The Contractor shall carry out the necessary procedures aimed at preserving the local flora and fauna, minimize negative impacts on sensitive, rare, threatened and/or endangered species, and preserve fauna and flora with commercial value (for example, fruit trees) for local communities. Of particular concern for transmission lines is the potential for bird collisions with power lines or towers.

The Contractor shall carry out the following activities to ensure the protection of flora and fauna along the proposed CASA 1000 route:

- If required, hire a qualified biologist who is familiar with native fauna and flora, and threatened and/or endangered species to help in the final location of the ROW and associated facilities;
- Carry out additional wildlife surveys in areas of identified critical wildlife habitat if required to finalize the biological characterization of the ROW and identify those areas of important wildlife habitat that may be affected by the project;
- Carry out a study of migration patterns of birds and their possible interaction with the CASA 1000 transmission line. Develop protection measures to avoid bird collisions;
- Based on data obtained from the survey on habitats of fauna and flora, their preferences, migration patterns, geographic distribution and biological characteristics, elaborate a list of threatened and/or endangered species that may be found in specific areas of the ROW and in other areas that might be affected by the access roads and the construction of transmission lines;
- Additional to the EIA where required, verify through additional reviews and field visits, those areas where sensitive species susceptible to suffer significant negative impacts may be present;
- Propose viable solutions to avoid or minimize the possible negative impacts for sensitive, rare, threatened and/or endangered species identified in the preceding steps. When feasible, the Contractor shall consider the redesign and relocation of the transmission line and/or access roads in order to avoid crossing through areas that constitute important or critical wildlife habitat.

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## PROTECTION OF FLORA AND FAUNA

The Contractor shall:

- Clean construction equipment brought in from outside the project to minimize the risk of introducing invasive weeds;
- Schedule the construction activities in such a way that they do not interfere or coincide with critical moments in the seasonal habits of species, such as periods of mating, nesting, spawning, breeding, etc. Consider limiting construction time to specific seasons, if required;
- Demarcate natural habitats for sensitive, rare, threatened and/or endangered species before the commencement of construction activities;
- Schedule construction activities during winter (when fish are not spawning or rearing their young). This mitigation measure needs to be applied only to stream crossings in areas that are known spawning or rearing habitat for important species;
- If fish-bearing streams must be crossed, larger bridge structures with longer spans shall be used;
- Delineate with temporary construction fencing, all vegetation to be preserved (*Also see: Clearing, Re-Vegetation and Restoration Management Plan*)
- Demarcate all natural habitats for sensitive, rare, threatened and/or endangered species that were known from the EIA or supplementary studies. This activity should be adequately considered by the Contractor at the time of the formulation of the contract bid and may not be cause for additional requirements and/or extensions of any kind;
- Be responsible for informing all employees about the need to prevent any harmful effects on natural vegetation on or around the construction site;
- Regularly check the work site boundaries to ensure that they are not exceeded and that no damage occurs to surrounding areas;
- Prohibit and prevent open fires during construction activities and provide temporary firefighting equipment in the work areas, particularly close to forest areas;
- Ensure that no hunting, trapping, shooting, poisoning or otherwise disturbance of any fauna takes place;
- Prohibit the feeding, capture or keeping of any wild animals; and
- Prohibit domestic pets or livestock on site.

## **BIRD PROTECTION**

- The potential for bird collisions along the entire CASA RoW shall be evaluated; including risk assessment for important bird use habitats and bird migratory areas;
- The PEO/PMU should evaluate all current avian protection measures used to prevent bird collisions with transmission lines or towers; and develop an avian protection plan to prevent bird collisions along the ROW;
- Conduct pre-construction surveys to identify seasonal and spatial construction restrictions;
- Transmission line siting will avoid areas of high bird collision risk;
- Transmission line design and construction will incorporate bird safe construction methods, including adequate line to line and line to grounded component spacing (e.g. 152 cm horizontal spacing and 102 cm for vertical spacing for eagles) to accommodate largest bird species known to occur in the area;
- Use marking devices on lines to make the wires more visible to birds if the collision potential is high, including clamp-on markers or other line markers (e.g. bird flight diverters) both on the top (shield) wire and conductors;
- Install perch discouragers on the crossarms in conjunction with other avian protection measures. To discourage perching between the conductor and discourager, leave no more than 13 cm between these components;
- Use caps and covers to protect against bird contact, including bushing caps, arrester caps, cutout covers, insulator covers and hose if adequate spacing is not attainable during design;
- Examine opportunities for constructing specific nest platforms for raptor and other species away from the CASA 1000 transmission line;
- Utilize a biological monitor during construction to ensure application of avian protection measures; and
- Provide adequate training to staff for bird identification and notification procedures in the event a nest is found in or near the ROW during construction.

## **AGRICULTURAL LAND, PASTURE AND GRASSLANDS**

Transmission lines can affect farm operations and increase costs for the farm operator. Potential impacts depend on the transmission line design and the type of farming. Transmission lines can affect field operations, irrigation, grazing, aerial spraying, wind breaks, and future land development.

To minimize adverse impacts on agricultural land and grasslands the following activities shall be implemented:

- 
- The final transmission line routing should consider the costs of crossing agricultural land (compensation) versus routing around agricultural land;
  - The Contractor shall establish a work program so that the construction activities do not interfere with irrigation of cultivated lands or land use for grazing;
  - If the construction activities must be carried out in irrigated areas, the Contractor shall provide for the construction of temporary irrigation canals, water diversion gates, and various structures that are required by affected property owners in order to maintain their irrigation systems;
  - The Contractor shall consult with landowners to determine point of entry to their property;
  - The Contractor shall provide reasonable access to landowners across ROW during all phases of project construction to minimize disruption to normal movements of farm equipment and animals;
  - The Contractor shall confine all construction activities to the ROW, designated access roads and ancillary sites. If additional ROW is required during construction, the Contractor shall obtain written approval from the landowners, the PEO and regulatory agencies. This may require additional land use agreements;
  - If agricultural fields must be crossed, larger structures with longer spans shall be used to span them;
  - Work in agricultural areas shall be performed preferably during the non-rainy season or winter months and when soils are not saturated to reduce the potential for soil compaction, erosion and crop impacts;
  - The Contractor shall maintain uninterrupted access of cattle to grasslands;
  - Existing fences to restrict movement of livestock shall be kept in good condition and gates must remain closed and locked;
  - Damaged wire and fences shall be repaired to the satisfaction of affected property owners after the completion of construction works;
  - If applicable and as necessary, temporary fences, gates, and cattle guards should be installed to control and minimize disturbance to livestock during project construction, operation, and maintenance; and
  - If compaction has occurred, use appropriate tillage implements for chisel plowing to break up compacted layers.

## **WATERCOURSES**

Transmission line impacts to rivers, streams, lakes, ponds, and other water bodies, although can be minimized by:

- Selecting appropriate equipment and vehicle crossing methods. Appropriate equipment and crossing methods shall be approved by SES and PEO, and relevant regulatory agencies;
- Designing the line to span the river, avoiding water and riverbanks;
- Avoiding the placement of poles in or immediately adjacent to river banks to reduce the potential for soil erosion into the stream;
- Using bushes to visually screen the line crossing;
- Maintaining shaded stream areas, where possible;
- Prohibiting construction and maintenance vehicles from driving in waterways as much as possible;
- If extra ROW is needed, obtaining permission for appropriate landowners prior to initiation of watercourse crossing;
- Hand-clear slopes leading to watercourses;
- Removing fallen trees, debris or soil inadvertently deposited within the high water mark of any watercourse to reduce damage to any aquatic habitat;
- Not skidding trees across a watercourse; nor pushing felled trees into a watercourse;
- Protecting watercourses from direct or indirect spills of pollutants, such as sediment, refuse, sewage, cement, oils, fuels, chemicals, wastewater, hydrocarbon products, etc;
- Using drip trays for all pumps, generators, etc. in order to prevent water contamination as a result of fuel spills or leaks;
- In the event of a spill, taking prompt action to clean up the spill as soon as possible in order to prevent the spread of contamination;
- Building temporary embankments to protect riverbanks and ponds from erosion;
- Constructing stream crossings as close to perpendicular to the axis of the stream channel as engineering and routing constraints allow;
- Using existing stream and river crossings locations if crossing is unavoidable, and existing crossings can stand the weight;
- Building temporary stream crossings such as fords, culverts, PVC and HDPE pipe bundles, and portable or on-site constructed bridges when existing crossings cannot be used. Temporary crossings are required to provide safe, erosion-free access across a stream for construction equipment. Properly designed, installed, and maintained temporary stream crossings can greatly reduce costs and help meet concerns of regulating agencies;

- If fording is unavoidable, it shall be undertaken at a slow speed and with clean vehicles (no leaks, etc.) and along a single track. Crossings should be as few as possible and as short as possible. To correctly cross a stream, the crossing should be located on a straight segment of the stream channel that has low banks (except for bridge crossings where higher banks are preferred to support the abutments); and
- All temporary crossings shall be removed at the close of construction. The Contractor shall remove stream crossing structures, restore and stabilize stream beds, banks and other disturbed areas to pre-existing conditions.

### **WETLANDS**

The Contractor shall:

- Avoid placing transmission lines through wetlands;
- Span wetlands wherever possible;
- If compaction of soil has occurred, restore the soil to its pre-construction condition after completion of works;
- Carefully clean construction equipment after working in areas infested by known invasive or exotic species.

### **WOODLANDS**

The Contractor shall:

- Avoid areas of natural forest or tree plantations;
- Adjust tower placement and span length to minimize the need for tree removal and trimming along forest edges; and
- Allow tree and shrub species that do not affect or compromise transmission lines to grow within the ROW.



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## **ANNEX 8: SAFETY MANAGEMENT PLAN**

This Annex deals with safety aspects of construction of the CASA 1000 project including construction site safety, blasting, fire control, unexploded ordinance, airports/airstrips, traffic management and environmental emergencies.

### **CONSTRUCTION SITE SAFETY**

The Contractor's safety responsibilities include the protection of every person and nearby property from construction accidents. The Contractor shall be responsible for complying with all national and local safety requirements and any other measures necessary to avoid accidents, including the following:

- Provide personal protective equipment and clothing (goggles, gloves, dust masks, hard hats, steel-toed boots, etc.) for construction workers and enforce their use;
- During heavy rains, accidents, or emergencies of any kind, suspend all work;
- Conduct sawing, cutting, grinding, sanding, chipping or chiseling with proper guards and anchoring as applicable;
- Establish safe sight distance in both construction areas and construction camp sites;
- Limit the speed of vehicles moving within the construction site;
- Place signs around the construction areas to facilitate traffic movement, provide directions to various components of the works, and provide safety advice and warning;
- Provide post Material Safety Data Sheets for each chemical present on the worksite;
- Require that all workers read, or are read, all Material Safety Data Sheets. Clearly explain the risks to them and their families. Encourage workers to share the information with their physicians, when relevant; and
- Ensure that the removal of toxic substances be performed and disposed of by specially trained workers.

### **BLASTING MEASURES**

In case that blasting is needed during construction of access roads, the following measures shall be put into place:

- When blasting, the Contractor shall take necessary precautions to prevent damage to special feature, the general environment and surrounding structures;
- Environmental damage caused by blasting / drilling shall be repaired at the Contractor's expense to the satisfaction of the SES and the PEO;

- The Contractor shall notify any occupants of surrounding land at least 48 hours prior to blasting and shall address any concerns that they may have to the satisfaction of the SES and PEO; and
- For the transportation, storage, process, package on site, connect, blasting and the disposal of the blasting, the procedure shall be in accordance with the respective national blasting regulations.

#### **FIRE CONTROL**

- The Contractor shall submit a fire control and fire emergency method statement to the PEO for approval. The method statement shall detail the procedures to be followed in the event of fire;
- The Contractor shall take all reasonable steps to avoid increasing the risk of fire through activities on site;
- The Contractor shall ensure that basic fire-fighting equipment is available at all camp areas and facilities;
- The Contractor shall appoint a fire officer who shall be responsible for ensuring immediate and appropriate action in the event of a fire;
- The Contractor shall ensure that all site personnel are aware of the procedure to be followed in the event of a fire and all required evacuation procedures;
- Any work that requires the use of fire may only take place at a designated area approved by the SES and PEO, and must be supervised at all times. Fire-fighting equipment shall be available.

#### **LANDMINES AND RESIDUAL UNEXPLODED ORDNANCE (UXO) PROCEDURES**

The exact location of unexploded ordnance along the CASA 1000 ROW is a major data gap. Clearance of unexploded ordnance shall be made during land acquisition and before commencement of construction work to avoid dangerous situations. Equipment can be destroyed and workers can be injured, or killed, if the area is not carefully surveyed and ordnance removed. Clearance needs to be carried out along the ROW, access roads, installation of substations and temporary construction facilities.

To ensure the safety of people and equipment involving construction and operation of the project, the PMU and PEO will be responsible for unexploded ordnance clearance, which should be implemented at the same time of land acquisition progress. This is a special task that shall be done by a specialized military agency only.

#### **GENERAL PROCEDURES**

The Project Management Unit (PMU) of National Electricity Board (NEB of individual countries) and the PEO have the responsibility of organizing and liaising with relevant de-mining clearance authority (in the particular case of Afghanistan, such agency would be The United Nations Mine Action Centre for

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Afghanistan, UNMACA) for the completion of initial site surveys as well as monitoring the Contractor's compliance with further procedures for landmines and UXO clearance and safety.

The PMU's scope with regards to survey and mine clearance procedures, includes defining the scope of de-mining works required and preparation of cost estimates. The PMU will have overall responsibility for engaging the de-mining Contractor, after receiving the relevant de-mining clearance authority approval. However, the Contractor will be responsible for contracting the successful de-mining company bidder after PMU and relevant de-mining clearance authority have given their non-objection.

A nominal lump sum amount has to be allocated for de-mining activities which has to be paid by the Contractor to the de-mining company and relevant de-mining clearance authority for services rendered.

After discussions with relevant de-mining clearance authority, the following procedures in mine clearance shall be observed:

- Apart from UXO and land-mine incidence, Contractor (s) should familiarize themselves with the security situation in the Project area and take all necessary procedures and precautions to protect their foreign and local workers;
- A scale map or GPS coordinates of alignment for the proposed Project design will be submitted to the relevant de-mining clearance authority. The agency will plot these points and overlay them to make an assessment of potential de-mining requirements for the initial survey;
- The ROW alignment shall be provided, checks will be made; mine clearing requirements in square meters will be given; the names of three accredited mine action companies will be given; and a price for coordination (quality control and certification etc.) by relevant de-mining clearance authority will be given;
- The above shall be undertaken by the PMU together with the Contractor to ensure that the ROW, workers' camps, and workstations, access roads areas, substations / junction station / switching stations areas are de-mined and safe for construction to begin.
- The Contractor will be required to call for tenders from the accredited agencies, with successful bidder chosen in consultation with the PMU and final approval by the relevant de-mining clearance authority;
- The Contractor shall present an evaluation of the three de-mining companies to the PMU and a recommendation for the selection of the de-mining company;
- After relevant de-mining clearance authority approval, the PMU shall issue a "Notice to Proceed" to the Contractor, who will contract the selected de-mining company;
- After de-mining is completed, a Certification of Mine Clearance from relevant de-mining clearance authority shall be submitted to the PMU, which in turn shall give a clearance to the Contractor to initiate construction activities; and

- The PEO shall submit monthly statements about the implementation of de-mining operations to the PMU.

### **UXO AND LANDMINE SAFETY<sup>69</sup>**

Anti-personnel mines and anti-tank mines are normally “off-road” devices, while unexploded ordnances (UXO) are devices such as rockets, bombs and booby traps that have not detonated. UXOs are more dangerous because they are found all over Afghanistan and other countries in rural and urban areas and may detonate without warning or contact.

The UN Security authorities recommend that people stay away from:

- Unused footpaths, tracks and shortcuts;
- Verges of vehicle tracks and roads;
- In and around culverts and bridge abutments;
- Alongside walls, especially damaged buildings;
- In doorways and room corners of empty houses and buildings;
- In and around wells and water access points;
- In irrigation and drainage canals;
- Around abandoned military posts and destroyed vehicles; and
- In low-lying or hidden areas of cover.

### **SIGNS OF POTENTIAL LANDMINES/UXO AREAS<sup>70</sup>**

The UN Mine Action Program paints rocks RED in dangerous areas and known minefields and when safely cleared by de-mining teams (for example, by UNMACA) the rocks are painted WHITE.

Signs of potential landmines or UXO in Unmarked areas include:

- Skeletons and dead animals.
- Small, round but regularly spaced potholes (mine detonation points).
- Uncultivated ground in what would normally be cultivated areas.

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<sup>69</sup> Giradet, E and Water, J (eds) 2004, “CROSSLINES Essential Field Guides to humanitarian and conflict zones: Afghanistan”, Second Edition – Fully Revised. Media Action International by CROSSLINES Publications, Geneva, Switzerland

<sup>70</sup> Giradet, E and Water, J (eds) 2004, “CROSSLINES Essential Field Guides to humanitarian and conflict zones: Afghanistan”, Second Edition – Fully Revised. Media Action International by CROSSLINES Publications, Geneva, Switzerland

- Ammunition containers and cases.

### **PRECAUTIONARY MEASURES DURING CONSTRUCTION ACTIVITIES**

Despite all the best efforts of the demining Company and relevant de-mining clearance authority certification, there is still a slight risk that some landmines and UXO's could be missed during mine clearance operations. Therefore, Contractors shall brief their workers on the safety in landmine and UXO and the ways to identify them.

If explosive materials are detected during the clearing of construction areas, earthwork movements, or any other construction activity, the Contractor shall:

- Stop construction activities immediately;
- Secure the area and inform the local authorities , the PEO and the de-mining company immediately;
- Under any circumstances shall the Contractor or any of the workers try to deactivate any explosive artifacts or lethal weapons; and
- Consider re-routing the alignment of the transmission line or spanning it.

### **AIRPORTS AND AIRSTRIPS**

Transmission lines are a potential hazard to aircraft during takeoff and landing. If the transmission line system is located in the vicinity of approach and departure flight paths from an airport and/or landing strips, the Contractor shall consider:

- Use special low-profile structures;
- Put a portion of the line underground;
- Place warning lights or other attention-getting devices on the conductors for night flights;
- Use markings for daylight such as well-visible ball markers on shield wires or neutral cables.

### **ELECTRICAL SHOCK HAZARDS**

- The Contractor shall ground all large metallic structures located near the line.

### **TRAFFIC MANAGEMENT**

The Contractor shall:

- Use selected routes to the project site, as agreed with the PEO, and appropriately sized vehicles suitable to the class of roads in the area, and restrict loads to prevent damage to local roads and bridges used for transportation purposes;

- Construction vehicles shall comply with established project speed limits;
- Maintain adequate traffic control measures throughout the duration of the construction activities and such measures shall be subject to prior approval of the SES;
- Carefully and clearly mark pedestrian-safe access routes;
- If local roads must be closed during the construction activities, provide alternative routes for residents and businesses that have commercial activities near the construction site;
- If roads must be closed for more than two hours, notify residents three days in advance;
- Promote and disseminate traffic safety information to local residents;
- If school children are in the vicinity, include traffic safety personnel to direct traffic during school hours;
- Ensure traffic safety at intersections, especially near sensitive areas (schools, markets, hospitals, and historical, cultural and religious places);
- Maintain a supply for traffic signs (including paint, easel, sign material, etc.), road marking, and guard rails to maintain pedestrian safety during construction;
- Use signs and flagmen for traffic control;
- Be held responsible for any damage caused to local roads and bridges due to the transportation of excessive loads, and be required to repair such damage to the approval of the SES and PEO;
- Materials leaving or entering the construction site shall be transported during non-peak hours in order to minimize traffic noise due to the increase in traffic volume;
- Not use any vehicles, either on or off road with grossly excessive noise or exhaust emissions, producing bad odors, or overloaded. In any built up areas, noise mufflers shall be installed and maintained in good condition on all motorized equipment under the control of the Contractor; and
- Provide parking spaces for workers' vehicles as well as construction vehicles in order to avoid interferences with the transit and parking of local vehicles, movement of emergency vehicles (fire trucks, ambulances, etc), normal activities of local residents, and construction activities.

#### **ENVIRONMENTAL EMERGENCY PROCEDURES**

Environmental Emergency procedures are unforeseen events that can occur during the construction of transmission lines. The Contractor shall be prepared to take any necessary measures to solve such emergencies on a case-by-case basis. Events related to adverse weather conditions shall be addressed as part of the Contractor's Safety Plan, which shall be submitted to the PEO before commencement of project construction works.

The following environmental emergency procedures shall be implemented during the construction of the Road:

- Training shall be provided to all construction workers and site staff to ensure that they are fully aware of the various possible emergency situations in construction activities, the danger and potential damages caused by the emergency to the environment and local communities, as well as the emergency response procedures to be followed;
- If explosive materials are detected during the clearing of construction areas, earthwork movements, or any other construction activity, the Contractor shall secure the area and inform the local authorities immediately, which in turn shall contact relevant authorities;
- If a person identifies a leakage/spillage, she/he shall immediately check if anyone is injured and shall then inform the Contractor, the SEO and SES;
- The Contractor shall ensure any injured persons are treated and assess what has been spilled/leaked;
- If the accidents/incidents generate serious environmental pollution or the SEO or the SES consider that the incident has the potential of resulting in serious environmental contamination problems (eg. spillage/leakage of toxic or chemicals, large scale spillage/leakage, or spillage/ leakage into the nearby water bodies which are used for irrigation/portable water), the SES or SEO shall inform the PEO immediately;
- In such cases, the Contractor shall take immediate action to stop the spillage / leakage and divert the spilled / leaked liquid to a nearby non-sensitive areas;
- The Contractor shall arrange maintenance staff with appropriate protective clothing to clean up the chemicals/chemical waste. This may be achieved through soaking with sawdust or other specialized absorbents (if the quantity of spillage/leakage is small), sand bags (if the quantity is large); and/or using a shovel to remove the topsoil (if the spillage/leakage occurs on bare ground);
- Depending on the nature and extent of the chemical spill, evacuation of the activity site may be necessary;
- The Contractor(s) shall prepare and present a report to the PEO on the incident detailing the accident, clean-up actions taken, any pollution problems and suggested measures to prevent similar accidents from happening again in future.



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## ANNEX 9: PHYSICAL CULTURAL PROPERTY CHANCE-FIND PROCEDURES

All Contractors and the CSE shall be trained by professionals before the construction starts to understand the procedures and the basics on how to recognize a potential archaeological chance find.

If the Contractor discovers archaeological sites, historical sites, remains and objects, including graveyards and/or individual graves during excavation or construction, the Contractor shall:

- Stop the construction activities in the immediate area of the chance find;
- Delineate the discovered site or area with marking tape or stakes;
- Secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be arranged until the responsible local authorities or the appropriate Cultural Authority takes over;
- Notify the SES or the PEO who in turn will notify responsible local or national authorities (within 24 hours or less);
- Relevant local or national authorities would be in charge of protecting and preserving the site before deciding on subsequent appropriate procedures. This would require a preliminary evaluation of the findings to be performed. The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage; those include the aesthetic, historic, scientific or research, social and economic values;
- Decisions on how to handle the finding shall be taken by the responsible authorities. This could include changes in the layout, or spanning of the line (such as when finding an irremovable remain of cultural or archeological importance) conservation, preservation, restoration and salvage;
- If the cultural sites and/or relics are of high value and site preservation is recommended by the professionals and required by the cultural relics authority, the Project's Owner will need to make necessary design changes to accommodate the request and preserve the site;
- Decisions concerning the management of the finding shall be communicated in writing by relevant authorities;
- Construction works could resume only after permission is granted from the responsible local authorities concerning safeguard of the cultural resource;
- Route changes are seldom necessary. Judicious transmission tower placement can often be used to span sites and avoid impacts to the sites.



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## ANNEX 10: COMMUNITY RELATIONS AND HEALTH MANAGEMENT PLAN

### COMMUNITY RELATIONS

The Contractor shall:

- Maintain open communications between local government and concerned communities;
- Prepare a mailing list to include agencies, organization, and residents that have an interest in the project;
- Disseminate project information to all affected parties (e.g. the local authority, businesses and affected households, etc) through community meetings before construction commencement;
- Provide a community relations contact from whom interested parties can receive information on site activities, project status and project implementation results;
- Provide all information, especially technical findings, in a language that is understandable to the general public and in a form of useful to interested citizens and elected officials through the preparation of fact sheets and news release, when major findings become available during project phase;
- Monitor community concerns and information requirements as the project progresses;
- If possible, establish a project contact telephone number. Respond to telephone inquiries and written correspondence in a timely and accurate manner;
- Inform local residents about construction and work schedules, interruption of services, traffic detour routes and provisional bus routes, as appropriate;
- Notification boards shall be erected at all construction sites providing information about the project, as well as contact information about the site managers, environmental staff, health and safety staff, employment opportunities, telephone numbers and other contact information so that any affected people can have the channel to voice their concerns and suggestions;
- Establish grievance procedures so that individual and community complaints about the project can be duly heard and rectified as soon as possible;
- Limit construction activities at night. When necessary, ensure that night work is carefully scheduled and the community is properly informed so they can take necessary measures;
- At least five days in advance of any service interruption (including water, electricity, telephone, and bus routes) the community must be advised through postings at the project site, at bus stops, and in affected homes/businesses. A coordination system between the Contractor and local authorities shall be set up to solve problems and incidents incurred.

- Before the project is completed, visit affected property owners to develop property-specific restoration plans. These plans will require the final approval of both the property owner and PEO

### **HEALTH MANAGEMENT PLAN**

The Contractor shall prepare and enforce a Health Management Plan to address matters regarding the health and wellbeing of construction workers, project staff and nearby communities. The Contractor Health Management Plan should be coordinated with health services provided by local government authorities.

The Contractor shall include in his proposal the outline of the Health Plan. The PMU will issue a certificate of compliance to the Contractor prior to the initiation of Construction.

The Contractor shall:

- Require screening of all workers on initial recruitment and afterwards annually;
- Implement a vaccination program including but not limited to vaccination against yellow fever, hepatitis A and B, tetanus, polio, etc.;
- Provide periodical health checks to construction workers to ensure their health and well-being;
- Provide appropriate information and education to the workforce on basic personal hygiene, prevention of diseases, including respiratory diseases, vector-borne diseases such as malaria dengue, Crimean-Congo hemorrhagic fever and sandfly fever, water and food borne diseases such as diarrhea and cholera and other infectious disease such as tuberculosis;
- Implement a program for workers and local communities, via an approved service provider, for the prevention, detection, screening, and diagnosis of sexually transmitted diseases, especially with regard to HIV/AIDS;
- Distribute educational materials to all workers including brochures, and leaflets which provide information of Tuberculosis (TB), HIV/AIDs symptoms and counseling and treatment services.
- Implement preventive measures against malaria, if applicable;
- Provide basic first aid services to the workers as well as emergency facilities for emergencies for work related accidents including a medical equipment suitable for the personnel, type of operation, and the degree of treatment likely to be required prior to transportation to hospital;
- Include a Pest Management Program for the construction areas, including construction work camp areas, in the Health Management Plan. The use of pesticides shall follow procedures acceptable to the World Bank and local governments; and
- Ensure correct maintenance of water and water treatment plants to prevent the breeding and proliferation of mosquitoes.

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## ANNEX 11: TRANSMISSION LINE DESIGN CONSIDERATIONS

Several of the specific impact issues that must be considered and the possible magnitude of those impacts are functions of the design parameters of the proposed transmission line. For example, the spacing and design of support structures will affect the amount of land removed from other productive uses for the life of the line. Also, line design and operational parameters will affect the potential for radio and television interference and the magnitude of electromagnetic fields created in the vicinity of the line. Evaluation of these and other system-specific issues requires careful design of the proposed transmission line and associated components.

Design parameters for electric transmission lines include the following:

- Voltage;
- Electric and Magnetic fields;
- Conductor type and configuration;
- Support structure design and spacing;
- Land requirements for construction staging areas, substations, or other facilities;
- Type and size of substations;
- Routing, including the length, width, and acreage of the proposed right-of-way (ROW);
- Areas where construction will require permanent clearing of trees, shrubs, and herbaceous vegetation;
- Changes in topography needed to accommodate the line;
- Aesthetics;
- Airports and airstrips
- Radio and television reception
- Requirements to remove man-made structures and resettlement needs;
- Property owner impacts (ROW easements, property values);
- Areas where transmission lines will be placed underground;
- Safety (fallen lines, lighting, induce voltage, and in the case of CASA project, UXOs)
- Crossing of highways, railways, waterways, wetlands, cultivated land, forested areas, etc;
- Endangered/threatened and protected species;

- Areas of archaeological, historical or recreational interest;
- Location and design of temporary and permanent access roads;
- Schedule

In addition to these design parameters, transmission line projects should include a discussion of the construction equipment to be used and construction method statements to be used (for example, special construction techniques to be used in areas of steep terrain or wetlands).

## ANNEX 12: TERMS OF REFERENCE FOR ENVIRONMENTAL SUPERVISION

This Terms of Reference is for the hiring of the **Workplace Safety and Environment Supervisor (SES)** and Construction Supervision Engineer (CSE).

### OBJECTIVE OF THE ASSIGNMENT

The Consultant is to provide professional technical services (“the Services”) to help ensure effective implementation of the Environmental and Social Management Plan (ESMP), its mitigation measures and environmental specifications during the construction of the CASA-1000 project.

In order to achieve the goal of minimizing the negative environmental impacts of the project, the ESMP has to be integrated in the design of the CASA 1000 transmission line and selection of the right-of-way, and in the technical specifications and contract documents. It will need to be closely followed and implemented by the Contractors. The implementation of the ESMP will therefore involve four parties:

- The **Project Environmental Officer (PEO)** responsible for overall coordination of EPM implementation. This person will be appointed directly by PMU.
- The Contractor’s **On-site Environmental Officer (SEO)** responsible for implementing the EMP and other construction related environmental and safety issues.
- The **Construction Supervision Engineer (CSE)** responsible for supervising and monitoring all construction activities and for ensuring that contractors comply with the requirements of the contracts and the EMP. The CSE will include a **Workplace Safety and Environment Supervisor (SES)**; and
- The **Independent Environmental Monitoring Consultant (IEMC)** who will carry out environmental monitoring twice a year, on all environmental-related issues regarding the contractor’s works.

### SCOPE OF SERVICES:

The general services to be provided by the SES are to inspect, monitor and audit construction activities<sup>71</sup> to ensure that mitigation measures adopted in the ESMP are properly implemented, and that the negative environmental and social impacts of the project are minimized.

The Contractor has the responsibility for ensuring compliance with the project ESMP and contract conditions while undertaking the works. This is overseen by the SES. The SES is therefore considered to provide an independent evaluation to ensure compliance with the ESMP and to ensure adequate performance of the Contractor relating to environmental and social issues.

<sup>71</sup> The term ‘construction activities’ in this TOR pertains to all aspects related to the CASA-1000 Project during the construction phase including, but not limited to, all construction sites, permanent and temporary camps, off-site activities (disposal sites, borrow pits), access roads, right-of-way clearing, structure foundation installation, tower installation, wire stringing, substations, traffic and disturbances (dust, noise) in local roads, areas of impact away from the project site, etc.

The SES will inspect, monitor and carry out environmental review of all construction contract packages and work sites. The SES shall have extensive knowledge and experience in environmental supervision, monitoring and auditing to provide independent, objective and professional advice to the client on the environmental and social performance of the project. The SES team leader shall be familiar with the project works through review of the relevant reports, including the EIA, ESMP as well as project technical specifications and contract documents.

As part of the CSE, the SES is expected to perform the following duties:

***PHASE I: PREPARATION***

The objective of Phase I is to lay the groundwork for the successful execution of the CASA-1000 project. In this phase, the SES shall: (i) review the ESIA, ESMP, project designs and technical specifications and confirm that there have been no major omissions of mitigation measures; (ii) prepare guidelines for contractors on implementing the ESMP; and, (iv) develop and execute a training program for all involved in construction activities.

The main tasks in this phase are:

**Review of Project Documents:** The SES shall review the ESIA, ESMP, project designs and technical specifications and confirm in writing that there have been no major omissions of mitigation measures. If any issues are identified, the SES shall propose to the PEO updates to the ESMP and the design and technical specifications to address these issues. Once approved by PEO, the SES shall update the ESMP.

**Environmental Supervision Checklist:** The SES shall establish a comprehensive checklist which will be used during the construction of the project to monitor the contractor's performance. This shall cover major aspects of the project, required mitigation/control measures and their implementation schedule.

**Log-Book:** The SES shall keep a log-book of each and every circumstance, or change of circumstances which may affect the ESIA or ESMP and non-compliance with the recommendations made by the SES to remediate the non-compliance. The log-book shall be kept readily available for inspection by all persons assisting in the supervision of the implementation of the recommendations of the ESIA, ESMP and Contract.

**Environmental Training:** The SES shall design and execute a comprehensive training program for all actors: Supervision Engineers, , PEO, Contractor's SEOs (and workers as part of the trainings given to the SEO), on the environmental requirements of the project, and how they will be supervised, monitored and audited, giving particular attention to:

- **ESMP:** The requirements of the ESMP, the agreed environmental supervision and inspection checklist, the environmental inspection form, how non-compliance with the ESMP will be handled, and all other key issues shall be covered. Particular attention will be paid to the specific provisions in each contract's technical specifications indicating how the ESMP is to be complied with;

- **Health and Safety:** The health and safety requirements of the project shall be clearly identified and communicated with the Contractors and PEO (included in environmental specifications for contractors).

At the conclusion of the training, Contractors will also sign a statement acknowledging their awareness of the environmental regulations, the ESMP, the compliance framework, and health and safety obligations. The CSE shall sign a similar statement confirming their understanding of the supervision responsibilities. This shall be provided to PMU and the World Bank.

### ***PHASE II: SUPERVISION OF CONSTRUCTION ACTIVITIES***

On behalf of the PEO and the Chief Supervision Engineer, the SES will:

- Review, and inspect in an independent, objective and professional manner in all aspects of the implementation of the ESMP and ESIA;
- Carry out random monitoring checks, and review on records prepared by the Contractor's SEO;
- Conduct regular work site inspections;
- Review the status of implementation of environmental protection measures against the ESMP and contract documents;
- Review the effectiveness of environmental mitigation measures and project environmental performance;
- As needed, review the environmental acceptability of the construction methodology (both temporary and permanent works), relevant design plans and submissions. Where necessary, the SES shall seek and recommend the least environmental impact alternative in consultation with the designer, the Contractor(s), and PMU;
- Verify the investigation results of any non-compliance of the environmental quality performance and the effectiveness of corrective measures;
- Provide regular feedback audit results to PEO and CSE according to the procedures of non-compliance in the ESMP;
- Provide training programs at minimum six monthly intervals and every time there are new workers or new Contractors coming into the site, including CSE and PMU staff, to appraise them of issues identified and how to improve environmental compliance;
- Instruct the Contractor(s) to take remedial actions within a specified timeframe, and carry out additional monitoring, if required, according to the contractual requirements and procedures in the event of non-compliances or complaints;

- Instruct the Contractor(s) to take actions to reduce impacts and follow the required ESMP procedures in case of non-compliance / discrepancies identified;
- Instruct the Contractor(s) to stop activities which generate adverse impacts, and/or when the Contractor(s) fails to implement the ESMP requirements / remedial actions instructed by the SES or the PEO.

**Review of Site Plans:** To ensure consistency across the project, the SES shall provide the final review and recommend clearance of all site plans which may affect the natural environment. The SES will review and approve the ESMP Implementation Plan and the Site Preparation and Restoration Management Plan presented by the Contractor. Where these plans are found not to comply with the ESMP, or ESIA, the SES shall work with the CSE and Contractor to establish a suitable solution.

**Health and Safety:** To ensure consistency across the project, the SES shall provide the final review and recommend clearance of all Contractors' Safety Plans, and, based on these, with inputs from the CSE, prepare an overall Project Safety Management Plan (PSMP). The PSMP shall include procedures such as blasting management, unexploded ordnance and land mines, safety during construction, the prevention of slope failure / soil erosion during the rainfall season, etc. These plans shall be reviewed on an annual basis and updated if necessary.

The SES shall ensure compliance with the requirements of the health and safety clauses in the contract documents. This shall include, but not be limited to: (i) construction activities; (ii) HIV/AIDS education campaign; (iii) compliance with national labor laws; and (iv) road traffic safety. For HIV/AIDS the focus shall not only be on the construction sites themselves, but also on assisting nearby communities.

**Site Inspections:** The SES shall closely audit the construction activities through regular site inspections accomplished through daily site visits, walks and visual inspections to identify areas of potential environmental problems and concerns. As noted in footnote 1 of this TOR, the area of inspection should cover both the construction areas and the environment outside the site area that could be affected, directly or indirectly, by the contractor's activities.

Inspections should be done independently from the Contractor's staff. It is expected that the SES shall have their own hand held and portable monitoring equipment such as cameras, transport and other resources. Where further inspection is necessary to resolve contentious issues or to impose penalties, the SES may contract third parties to carry out specific evaluations at the locations under review.

Where there is infringement of technical specifications, or condition of contracts, or non-compliance with the ESMP, the SES shall be immediately inform the Contractor's Chief Engineer, Supervision Chief Engineer and PEO. The SES shall also report all infringements to the PMU as part of monthly reporting.

Regular joint environmental site inspections (e.g. weekly) should be organized by the SES and CSE, with participation of the SEO. These should be used as an opportunity for the SES to further train the CSE and Contractor's staff.

The CSE field engineer's log-book shall be kept readily available for inspection by all persons assisting in project management, including the PEO/PMU .

The SES shall also regularly review the records of the contractor to ensure that they are up to date, factual and meet the ESMP reporting requirements (*e.g.* environmental complaint monitoring records).

**Complaints:** Complaints will be received by the Contractor's Site Office from local residents with regard to environmental infractions such as noise, dust, traffic safety, etc. The Contractor's Chief Engineer or SES, and the SEO shall be responsible for processing, addressing or reaching solutions for complaints brought to them. The SES shall be provided with a copy of these complaints and shall confirm that they are properly addressed by the Contractors in the same manner as incidents identified during site inspections.

**Unforeseen Impacts:** In the event that an incident arises which was not foreseen in the ESMP or ESIA, the SES shall work closely with the Contractor, and the PEO to confirm satisfactory resolution to the incident. The SES shall then update the ESMP and the implementation guidelines, training the Contractors' staff accordingly.

**Monthly Budget and Payments:** The SES shall confirm the monthly payments for environmentally related activities as recommended by the SES to the client.

**Site Restoration and Landscaping:** The SES shall closely monitor all activities with regard to site restoration and landscaping in areas such as borrow pits, quarries, camps, etc. to ensure that the activities are done to an appropriate and acceptable standard. The SES will agree with the Contractor on a Site Decommissioning and Restoration plan to be implemented before the completion of the construction of the access road and bridges.

**Project Initiation and Staffing:** It is anticipated that the CSE and the SES, will be mobilized three months before the start of the construction activities. The three month start up time will be utilized by the SES to review and familiarize itself with the project, the project design, the technical specifications, contract documents, the EIA, ESMP and other project relevant documents and reports. Following the review, the SES will prepare a brief report on the potential issues and challenges arising from the implementation of the ESMP and the condition of contracts and make recommendations to the PMU about how best to improve the implementation of the ESMP.

The SES is expected to be mobilized at the beginning of the contract, to prepare the necessary guidelines, documentation, training, *etc.*

**Reporting:** As a minimum the SES shall prepare the following written reports:

- Weekly report of non-compliance issues;
- Summary monthly report covering key issues and findings from reviewing and supervision activities; and

- Consolidated summary report from contractor's monthly report.

The SES shall also collect and report on data as requested by the PMU.

At the end of the project, the SES shall prepare a final report summarizing the key findings from their work, the number of infringements, resolutions, etc. as well as advice and guidance for how such assignments should be conducted in the future.

During the course of the project the SES shall provide briefings as requested by the PEO/PMU, environmental agencies, the World Bank, and NEB on the project progress, incidents, and other issues associated with environmental management and supervision. As a minimum these are expected to be at six-month intervals.

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## **ANNEX 13: TERMS OF REFERENCE FOR THE INDEPENDENT ENVIRONMENTAL MONITORING CONSULTANT (IEMC)**

The following is a terms of reference for hiring of the IEMC.

### **OBJECTIVES OF THE ASSIGNMENT**

The Independent Environmental Monitoring Consultant (IEMC) will be contracted to provide professional services (“the Services”) regarding environmental sampling, and reviewing compliance to the Environmental and Social Management Plan (ESMP) and the Environmental Specifications of the Project. The IEMC shall provide support to PMU to establish and operate environmental management systems, offers suggestions for adjusting and building capacity during the implementation period and monitor the Contractor’s EMP implementation plan in both construction and operation stages. The IEMC will also be responsible for prepare monitoring reports on ESMP implementation and submit these reports to PMU for approval.

Through this assignment, the effectiveness of the mitigation measures and reporting procedures will be verified, or recommendations shall be made regarding alteration of construction method or additional mitigation measures to make sure that the potential negative impacts related to the construction and operation of the proposed CASA-1000 Project are minimized.

### **Institutional Arrangements for ESMP implementation**

In order to achieve the goal of minimizing the negative environmental impacts of the project, the ESMP has been integrated in the design of the CASA 1000 project, and in the technical specifications and contract documents. It will need to be closely followed and implemented by the Contractors. The implementation of the ESMP will therefore involve four parties:

- The ***Project Environmental Officer (PEO)*** is the person responsible for overall coordination of EPM implementation. This person will be appointed directly by PMU.
- The ***Construction Supervision Engineers (CSE)*** who are responsible for supervising and monitoring all construction activities and for ensuring that contractors comply with the requirements of the contracts and the EMP. The CSE will include a ***Workplace Safety and Environment Supervisor (SES)***;
- The Contractor’s ***On-site Environmental Officer (SEO)*** responsible for implementing the EMP and other construction related environmental and safety issues.
- The ***Independent Environmental Monitoring Consultant (IEMC)*** who will carry out environmental monitoring three times a year, on all environmental-related issues regarding the contractor’s works.

**SCOPE OF SERVICES**

The IEMC shall carry out monitoring on a quarterly basis (three times a year), on all environmental-related issues regarding the contractor’s works. The IEMC will carry out field sampling, monitoring and check, review, verify and validate the overall environmental and social performance of the project through regular inspections and review. This review will provide confirmation that the reported results are valid and that the relevant mitigation measures and monitoring program provided in the Project ESMP are fully complied with. They will also supply specialized assistance to the PEO/PMU in environmental matters. The IEMC’s specific tasks will include, but not limited to, the following:

**TASK 1: ENVIRONMENTAL SAMPLING MONITORING**

The IEMC shall carry out sampling and monitoring of the air and water quality with parameters and frequency specified in the table below

1	Type of monitoring	Parameters	Locations	Frequency
	<i>Air Quality Monitoring during construction stage</i>	Total dust PM10, noise, vibration, CO, NO <sub>2</sub> ,SO <sub>2</sub> , Pb, O <sub>3</sub>	TBD	Quarterly Review of CSE/SES and SEO records
	<i>Water Quality Monitoring during construction stage- Supervision on domestic water of local people in project study area</i>	- pH; COD; BOD; DO, total N; PO <sub>4</sub> <sup>-</sup> ; total Fe, Oil and grease; Total Suspended Solids; colifom  - pH; COD; BOD; DO, total N; PO <sub>4</sub> <sup>-</sup> ; total Fe, Oil and grease; Total Suspended Solids; colifom	TBD	Quarterly Review of CSE/SES and SEO records

**TASK 2: REVIEW AND ASSESS COMPLIANCE TO ESMP BY PMU, CSE, SES AND THE CONTRACTOR**

The IEMC shall review and evaluate the environmental performance and compliance of ESMP by the PEO/PMU, CSE/SES and the Contractor/SEO from design to construction phases. The IEMC shall also assess the effectiveness of the mitigation measures to be implemented and the effectiveness of the reporting procedures. The review and evaluation should cover, but not limited to the following:

**Desk Top Review:** The IEMC shall review the completeness of the environmental records, reports and documents prepared by the PMU, CSE, SES and the Contractor related to:

- Review the activities carried out and the records and documents created, updated, or maintained by the CSE/SES;
- Written confirmation that there have been no major omissions of mitigation measures, or proposals on the updates to the ESMP and the design and technical specifications to address these issues;

- Checklists developed for use during the construction of the project to monitor contractor performance;
- A log-book of each and every circumstance or change of circumstances which may affect the environmental impact assessment and non-compliance with the recommendations made by the SES to remediate non-compliances;
- Records on the design and training program for Supervision Engineers, Contractors, PMU staff, and workers,
- Records on day-to-day supervision carried out by the CSE/SES, such as:
  - Review and inspect all aspects of the implementation of the ESMP;
  - Random monitoring checks and review on records prepared by the Contractor's SEO;
  - Regular site inspections;
  - Review the status of implementation of environmental protection measures against the EMP and contract documents;
  - Review the effectiveness of environmental mitigation measures and project environmental performance;
  - Review the environmental acceptability of the construction methodology (both temporary and permanent works), relevant design plans and submissions, if applicable;
  - Verification on the investigation results of any non-compliance of the environmental quality performance and the effectiveness of corrective measures;
  - Feedback review results to the PEO/PMU and CSE according to the procedures of non-compliance in the ESMP;
  - Review and recommendations for all site plans prepared by the Contractor;
  - Monitoring of all activities with regard to site restoration and landscaping;
  - Confirmation on proper address of complaints by the Contractor and/or PMU; and
  - Proof of coordination between the SES and the CSE, the Contractors, and the PMU to confirm satisfactory resolution to the unforeseen impacts.
- Review the activities carried out and the records and documents created, updated, or maintained by the Contractor or the SEO:
  - Records and documents prepared for training on environmental awareness for the Contractor's workers;

- Site surveillance to investigate the Contractors' site practice, equipment and work methodologies with respect to pollution control and adequacy of environmental mitigation measures implemented;
  - Monitor the implementation of environmental mitigation measures and the Contractor's compliance with environmental protection, pollution prevention and control measures, and contractual requirements;
  - Advice to the Contractor(s) on environment improvement, awareness and proactive pollution prevention measures;
  - Investigation and proposals on mitigation measures to the Contractor(s) in the case of non-compliance / discrepancies, if applicable;
  - Proof of participation in the monitoring and implementation of remedial measures to reduce environmental impact;
  - Review the success of the ESMP to cost-effectively confirm the adequacy of mitigation measures implemented;
  - Preparation and submission of Contractor's Compliance Reports and inclusion of environmental mitigation measures into Contractor's progress reports;
  - Complaint investigation, evaluation and identification of corrective measures; and
  - Additional monitoring works within the specified timeframe instructed by the Supervision Engineer and/or PMU.
- Review the activities carried out by PEO/PMU and records and environmental documents submitted to PEO/PMU by the SES and Contractor:
    - Allocation of staff responsible for environmental issues;
    - SEO, SES's recommendations, approval and follow up;
    - Records on complaints received and solutions; and
    - Records of the mitigation measures implemented by PMU as specified in the ESMP.

#### **RANDOM SITE AUDIT**

As part of the monitoring process, the IEMC may carry out a random audit check at the site. The IEMC shall visually look at the construction sites and make notes related to the following environmental issues, but not limited to:

- Compliance/violation to prohibitions to Contractor's workers as specified in the Environmental Specifications;

- Application of mitigation measures for soil erosion along the access roads, RoW, substations, workers' camps, construction facilities, watercourses, etc. due to excavation and tree cutting;
- Waste management practices at worker's camps, and at the construction sites;
- Disruption of existing services during construction;
- Status of construction workers' camps and sanitation facilities;
- Water quality control facilities at and surrounding the workers' camp;
- General clean up after construction works;
- Status of landscape rehabilitation, re-vegetation in the disturbed areas, particularly at borrow pits and quarries, disposal sites, workers' camps, access roads, substations, residential areas, etc;
- Impacts of construction works (level of noise, dust) on surrounding residential areas, and damage to roads due to earthworks and transportation of building materials; and
- Status of implementation of safety measures (signboards, restricted zone, fences, the use of protective equipment, etc.), particularly at the intersections and other traffic hotspots.

The IEMC shall also conduct public consultation to:

- Assess the level of involvement by the local authorities in dealing with environmental issues (dust, noise, and damage to roads due to the transport of construction materials, tree cutting on public lands and protected areas);
- Identify any other environmental issues and record environmental complaints from affected people or communities; and
- Report on responses (if any) from appropriate local authorities on environmental complaints or non-compliance.

### **CONSULTANT QUALIFICATIONS AND STAFFING**

It is anticipated that the IEMC will be mobilized three months after the start of the construction activities. Prior to mobilization, time will be needed for the IEMC to review and familiarize itself with the project environmental monitoring program, and ESMP, preparing the inception report and plan for their first field trip.

The Consultant shall submit the qualifications of the following key persons:

#### **ACTIVITY LEADER/SENIOR ENVIRONMENTAL CONSULTANT**

The position will be a senior environmental specialist with at least a Master degree in environmental science or related discipline and have 10 year's experience working with the environmental aspects of

construction. Priority is given to the person who has experience in assessing and monitoring environmental aspects related to transmission lines. The Team leader should be familiar with the World Bank's environmental and social impact guidelines and have a proven record of managerial capabilities. The Team Leader will be responsible for directing the environmental monitoring for the project

He /she will lead the team during the field visit to inspect the Contractor's compliance with the EMP, check the implementation of mitigation measures, assess the effectiveness and adequacy of the mitigation measures proposed/implemented, and give advices on additional mitigation measures or corrective actions, if necessary. At the end of each visit and before leaving the sites, he/she will lead discussion and brief to PMU, SES and SEOs about their main findings and advise them on what need to be improved, evaluate compliance to ESMP. He will take lead in the preparation and quality control of the six monthly monitoring reports. Fluency in spoken and written English will be required.

#### **FIELD ENVIRONMENTAL INSPECTION OFFICER(S)**

This position(s) will require at least 5 year's experience and a good understanding of the environmental issues related to civil works, environmental impacts assessment and management processes. They will visit the project to inspect the Contractor's compliance with the ESMP and check the implementation of mitigation measures. He/she will also check relevant environmental documents and records prepared during construction phase. At the end of each visit and before leaving the sites, they will participate in discussions with PMU, SES and SEOs about their main findings and advise them on what need to be improved. Knowledge of English language is required.

#### **ENVIRONMENTAL MONITORING SPECIALIST(S)**

This position(s) will require at least 5 years experience in environmental analysis and monitoring activities. They will be responsible for conducting environmental monitoring activities, including sampling, analyzing results and writing monitoring reports. Knowledge of the English language is required.

#### **REPORTING REQUIREMENTS AND TIME SCHEDULE**

For each report 10 copies in local language and 3 copies in English shall submitted. In addition to hard copies, one digital electronic copy shall also be submitted. At the end of the contract, a digital copy of all documents relevant to the project shall be compiled in an orderly manner on a CD and be submitted to the Client.

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PART E: LARF

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## **1. INTRODUCTION**

### **1.1 BACKGROUND TO THE LARF**

Norms and principles currently accepted among international financial institutions clearly state that development designs and operations must incorporate social and environmental safeguard mechanisms. This Land Acquisition and Resettlement Framework (LARF) addresses these norms and principles with respect to land acquisition, compensation for loss and resettlement associated with the CASA 1000 Project. This LARF is not to be considered as a final plan(s). Rather, it will guide the processes involved to implement context specific resettlement action plans for each country and within each national context.

The term “ the Project” is used throughout this LARF to refer to the Project Proponent or Authority.

### **1.2 WHAT IS A LARF AND RAP?**

This Land Acquisition and Resettlement Framework (LARF or the Framework) establishes the parameters for the conduct of land acquisition and resettlement of displaced persons who may be affected during implementation of the proposed CASA-1000 transmission line project. While the number of people and magnitude of adverse impacts are expected to be minimal, the Project should work to further minimize the number of displaced persons and/or adverse impacts of this proposed transmission line project. The LARF outlines the tasks that are needed to develop a full Resettlement Action Plans, or RAPs. The LARF essentially provides a guide to enact context-specific RAPs in each country.

### **1.3 LAND ACQUISITION AND RESETTLEMENT FRAMEWORK OBJECTIVES**

The objective of this report is to provide guidance for the CASA 1000 Project on what social mitigation measures should be in place concerning the LARF at all stages of the CASA 1000 Project -- design, construction, and post-construction. Understanding why and how people live in the CASA 1000 RoW areas is the most important element in designing a successful resettlement framework and ensuing resettlement actions plans.

A secondary objective of the LARF is to convey the urgency of putting this framework into operation and of implementing context-specific Resettlement Action Plans in each CASAREM country. This urgency derives from the socio-political contexts of these four countries. In the CASA regions, people are already familiar, directly or indirectly, with what involuntary resettlement means in negative terms, as a result of conflict, natural disasters, or other state-imposed development programs. Such issues can result in delays in land acquisition and resettlement processes. To avoid heightening or attracting additional security and safety concerns, or experiencing project delays, it is highly recommended that project proponents put this Land Acquisition and Resettlement Framework into operation immediately.

## HOW PART E IS ORGANIZED

The LARF is divided into the following sections:

**Section 1.4** describes ten tasks providing guidance for preparing country specific resettlement action plans.

### Ten Action Tasks

**Section 2** provides a brief description of LARF specific World Bank operational policies and guidelines, plus a list of national frameworks. Specific national policy descriptions can be found in Part E of this document. General LARF Mitigation Measures are provided.

### Relevant International & National Frameworks

**Section 3** provides a list of guiding principles for the LARF.

### Guiding Principles

**Section 4** provides a discussion of existing data gaps with regard to carrying out LARF tasks outlined in Section 1.4. Samples of Social Assessment surveys are provided in Appendix 1 of this document.

### Socio-Economic Assessment Guide

**Section 5** provides a guideline for the valuation of compensation entitlements and asset valuation. This section also provides guiding principles with regard to assessing host sites and developing livelihood reconstruction plans.

### Eligibility Criteria & Entitlements Guide

**Section 6** provides a guideline for consultation, participation and grievance mechanisms specific to LARF. Institutional arrangements for the implementation of the LARF specific to each CASAREM country is also discussed.

### Stakeholder Participation Guide

**Section 7** provides a guideline for internal and external and independent monitoring of project operations and LARF action plans.

### Monitoring

**Section 8** provides guidance for the budget of the LARF and country specific RAPs.

### Budget for Resettlement

## 1.4 PROCESS FOR CONVERTING LARF INTO A FULL RAP

### TASK 1 - SCREENING

This Land Acquisition and Resettlement Framework adapts to each country/area/region cultural and social context. The CASA 1000 Project resettlement team (see the Stakeholder Participation Guide Section 6 for guidance) should enact and manage the full Resettlement Action Plan (RAP) from this LARF. Task 1 is a very detailed screening exercise and as such the full RAP would simply have to update this information. This screening exercise involves reading this LARF and outlining where the proponents are in terms of project design planning and potential start construction dates. Have proponents factored in the time to consult, to socially assess and to compensate the affected populations? Action plans can be developed from answering these kinds of questions. This document will assist proponents in their preparation of these context specific resettlement action plans, guided by this land acquisition and resettlement framework (LARF).

### TASK 2 - COMMUNITY CONSULTATION

This is not only a mandatory process but it is a critical component of the resettlement process. The Stakeholder Participation Guide in Section 6 of this LARF will provide guidance about the expectations of consultation and the organizations and institutions that need to be in place to fulfil this task. Effective consultation and “due process” will at all stages of the LARF and RAP ensure that best practices locally, nationally and internationally are being followed. Types of consultations include:

- **Information Exchange:** preliminary information exchanges were conducted in 2008/2009 however to ensure that resettlement is avoided and or mitigated – information exchanges should be incorporated into project design and planning towards this end;
- **Capacity Building and Education:** Affected Peoples should be informed of their options and rights pertaining to resettlement and compensation;
- **Participation Promotion:** Project proponents should also provide ongoing periodic reports to the affected communities that will describe the progress and/or news of any material changes related to the implementation of action plans directly related to ongoing risks or impacts. The frequency of these reports should be proportionate to the concerns of the affected communities, and, at least annually. All stakeholders should be allowed to openly voice their concerns, any issues and possible disputes without fear or recrimination; and,
- **Discussion and Negotiation:** Affected people should be consulted with, and offered choices among technically and economically feasible resettlement and compensation alternatives.

A general grievance mechanism is provided in Section 6 (Stakeholder Consultation Guide), to be tailored in each country and regional context. The affected communities are not a homogenous group and should not be treated as such. There are internal diversities within each affected community that need to be accounted for. A World Bank compliant social assessment will help to more clearly understand

how each country and regional context operates their governance and decision making structures. It cannot be assumed that one model of a grievance redress will work in the same way everywhere. What can remain the same throughout is the way the project proponent will receive the information and deal with it administratively. What will change are the procedures to resolve the problem(s) from one area to the next. These redress mechanisms should come at no cost and without retribution to the party that originated the issue or concern. As well, the redress mechanisms should not impede the complainants' access to local and national judicial or administrative remedies.

### **TASK 3 - BASELINE SOCIAL ASSESSMENTS/HOUSEHOLD AND COMMUNITY SURVEYS**

To determine existing communal property systems and natural resources such as timber and non-timber forest products, fresh water, medicinal plants, hunting and gathering grounds and grazing and cropping areas, a socio-economic/land-use assessment of the potentially affected households and communities is required. It is critical to implement and monitor a successful RAP that is compliant with international and national social safeguards (i.e. WB 2004, Equator Principles 2004). A baseline assessment will determine with any certainty if project related activities are liable or not for future negative circumstances to project affected persons..

These assessments/surveys include:

- **RoW Mapping:** GIS and Field Mapping, socio-economic spatial patterns, and natural features of the resettlement site and the host site;
- **Census:** physically and economically displaced;
- **Asset Inventory:** permanent and temporary losses: homesteads and homestead structures, trees and natural resources, graves associated with each household, community resources including schools, places of worship, and health centers, community land and natural resources, and sites of cultural or historical importance, suite of assets owned i.e. bicycles, television, radios, mobile phones etc.

There has been some valuation of assets completed to date. However, household and community surveys have not been conducted to determine if the categories used are sufficient or not. The Eligibility Criteria and Entitlements Guide in Section 5 of this LARF describes the categories for country specific entitlement matrices that have been recognized. A gender sensitive baseline social assessment will help proponents develop a context specific entitlement matrix that will provide guidance for compensation, resettlement, and livelihood reconstruction assistance planning in each context. The entitlement matrix provides all possible categories of losses to ensure that all resettlement impacts of all components to be finalized during design will be addressed. It is important to know how people use the land on a seasonal basis.

This task especially is vital to the entire LARF process and should be conducted immediately. Further details about the data that needs to be collected to enact this LARF are provided in the Data Gaps & Socio-Economic Assessment Guide Section 4 along with sample questionnaires in Appendix 1.

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#### **TASK 4 - IDENTIFICATION AND EVALUATION OF RESETTLEMENT SITES**

Considerations to be made during site selection process: location, access to natural resources, maintaining community structure, continued access to existing economic activities, impacts on host communities, land ownership and tenure rights.

Resettlement requires the physical relocation of people to a new location. The process to identify and select a resettlement site should be transparent and include consultation with the affected households and if relevant, the host community. The Eligibility Criteria and Entitlements Guide in Section 5 outlines the processes involved to identify and evaluate resettlement sites.

#### **TASK 5 - DETERMINATION AND NEGOTIATION OF ENTITLEMENTS AND COMPENSATION**

As stated in Task 3, through a social assessment, the resettlement process requires the Project to identify households, individuals and communities that are deemed to be entitled to compensation. Lack of title/customary rights recognized under law will not be a bar to entitlement. Hence, non-titled encroachers and squatters as well as tribal or other groups with customary rights over land or resources, if present in the project area, will be eligible for compensation (the entitlement matrix provides additional elements to vulnerable persons). However, people moving into the project area after the cut-off date are not entitled to compensation and resettlement benefits.

Early in the resettlement process, a process of negotiation and agreement needs to be formulated, and agreed to, by all stakeholders involved. For instance, a process of negotiation and agreement might include, and is not limited to, a cut off date of those who will be deemed entitled: a Master List of beneficiaries. The nature of the entitlement will vary between each individual and households. The operation entity and unit of entitlement is generally envisaged as being the household as a whole.

In some instances, the Project can expect that this may have to be re-examined and negotiated with individuals within the household. To ensure that project related activities do not create disunity within any households or communities, criteria as to how these tasks will be negotiated and approved will have to be defined early in the resettlement process and should be agreed to by all stakeholders (see the Stakeholder Participation Guide). The project affected committee outlined in the Stakeholder Participation Guide in Section 6 will help proponents move towards these ends with the household if such an issue arises. The Stakeholder Participation Guide and the Eligibility Criteria Guide outlines the parameters for which the Eligibility Criteria could be negotiated.

#### **TASK 6 - INCOME RESTORATION AND SUSTAINABLE DEVELOPMENT INITIATIVES**

The Socio-economic information collected in Task 3 will assist to identify the economically displaced, and or, land-based livelihood users and develop sustainable livelihood reconstruction plans in collaboration with them, and or, their representatives. The Entitlement Guide, Section 5 provides a general guideline for the processes that are involved to develop context appropriate livelihood reconstruction.

Re-examination and negotiation about proposed livelihood initiatives will need to be conducted in collaboration with said project affected peoples from the beginning. Establishing connections with local government and non-governmental units and advocacy groups will be critical for the success of livelihood reconstruction programming. Livelihood programming generally fails, lacking meaningful consultation with those the programs are supposedly meant for. Drawing from previous social assessments will go a long way to assist those in charge of action planning for this LARF. Section 5 goes into some detail about community development investment strategies to ensure that those receiving these benefits will ensure its viability and sustainability in the long term.

#### **TASK 7 - RESETTLEMENT PLANNING, SCHEDULING, BUDGET AND RESPONSIBILITIES**

Each RAP should provide detailed information in terms of:

**Resettlement planning:** Defining the overall strategy in terms of resettlement, likely phasing and means of compensation. Further consideration will be needed in terms of construction of any resettlement structures, labour and other issues;

**Schedules:** Defining the timing for resettlement in terms of the physical resettlement, payment of cash compensation and ensure that it aligns with any civil engineering required by the project;

**Budgets:** Resettlement costs are often underestimated and thus detailed budgeting/costs for the implementation of the resettlement should be provided. WB 4.12 clearly states that as a result of being affected by the project the affected peoples should not be put at any economic burden. These kinds of considerations need to be incorporated dependent on the context and situation of entitlements and compensation; and

**Roles and Responsibilities:** Organizational structures and responsibilities must be clarified prior to resettlement. Section 6 (Stakeholder Participation Guide) provides known local agencies and institutions that are involved in Land Acquisition and Resettlement in each country context. However, these organizations and institutions may not exist and or their responsibilities may have changed since 2008/2009. A Social Assessment outlined in Section 4 that is required will help determine if such changes have occurred or not.

These various components should be developed based on the outcomes of the previous steps, negotiated and discussed with the relevant consultative parties and relevant local and national authorities.

Time frames are often dictated by the consultative process that has to be followed and the need to reach agreement with affected people. Pointers with regard to these aspects are developed as part of this LARF. Given these countries socio-political contexts a thorough social assessment will take a long time, and, as it has been suggested, years. The scope of these social assessments that were given as part of this LARF is meant to show what this LARF needs immediately as a way to move forward.

Typically the development of each individual RAP (separate from the required social assessments) will take an estimated time of twelve months but overruns to eighteen months can be expected.

#### **TASK 8 - PRODUCTION OF RESETTLEMENT ACTION PLANS**

Within the COI, the resettlement action plan is a plan that provides a synthesis of the outcomes of the above tasks.

#### **TASK 9 - INITIATION OF RESETTLEMENT AND COMPENSATION**

The physical resettlement and compensation should be initiated in line with the relevant RAP. Overall responsibility for the implementation of the RAP's will lie with the Project but managed by the Project environmental and social team, and or, the Project resettlement team.

#### **TASK 10 - MONITORING**

Internal and external independent monitoring mechanisms and indicators are a critical component of the resettlement project. The information gathered through the initial ESA is designed to provide a baseline of data against which all standard World Bank indicators for resettlement can be monitored. Requirements for monitoring are set out in Section 7.



## 2. POLICY AND LEGAL FRAMEWORKS REGARDING LARF

### 2.1 WORLD BANK OPERATIONAL POLICIES

A number of WB Operational Policies address land acquisition and resettlement issues as follows:

#### WB OP 4.01

- Requires proponents to conduct a Strategic Environmental and Social Assessment (updated 2011), and, prepare Social Management plans from baseline data collection.
- Emphasizes the importance of a baseline assessment capturing context specific socio-cultural household and community data.
- Describes the procedures and guidelines for conducting assessments including aspects to be considered in public consultations and information disclosure.
- Provides environmental screening guidelines for classifying projects into various categories (A, B, C and FI).
- Contains three Annexes providing the definition of terms, guidelines for preparation of EA reports and procedures and policies for preparation of Management plans.

#### WB OP 4.11

- Describes policies with regards to cultural properties, sites and structures that have significant archaeological, historical, religious, cultural, or aesthetic value.

#### WB OP 4.12

- Proponents will provide: (1) compensation to replace lost assets, livelihood, and income; (2) assistance for relocation, including provision of relocation sites with appropriate facilities and services; and (3) assistance for rehabilitation to achieve at least the same level of well being with the project as without it. Some or all of the elements may be present in a project involving IR.
- This is a critical policy document for this Resettlement Action Plan and states the following principles:
  - Avoid resettlement whenever feasible, or, where resettlement is unavoidable, minimize its extent by exploring all viable alternatives.
  - Where Land Acquisition and Resettlement is unavoidable, resettlement activities are carried out in a way that provides a sufficient opportunity for the people affected to participate in the planning and implementation of the operation.

- The construction documents must include provisions for minimizing temporary dislocation. These provisions should include precise scheduling of construction and the use of appropriate construction technology to reduce disruption.
- If incomes are adversely affected, adequate investment is required to give the persons displaced by the project the opportunity to at least restore their income.
- If a linear project will displace only a few people, turning to the market for replacement plots and houses will simplify the resettlement process and increase satisfaction of the affected families.
- Because the populations displaced along a linear corridor may be culturally heterogeneous, standardized resettlement solutions may not work. Case-by-case solutions may be required.
- If the affected population is dispersed, negotiation with each family or economic unit may be more effective than negotiating with community representatives.
- Communities should be consulted to determine the location of underpasses and overpasses for people, livestock, and vehicles.
- Whenever possible, people adversely affected are to be made project beneficiaries. For example, they should be provided with access to energy, in transmission line projects; with transportation, in rural road projects; with serviced plots, in irrigation projects; or with water and improved hygienic conditions, in water and sanitation projects.
- Permitting continued seasonal use of nonessential areas within the RoWs and in areas under transmission lines may be especially important for the poorest segments of society.
- Incorporation of project bays, parking spaces, and so forth within the main designs will greatly help in relocating street vendors and others in the informal economy, while ensuring safety for users of roads and railways.
- Establishing a cut-off date for eligibility as soon as project designs are ready is the most efficient way to prevent fraudulent claims for assistance.

## **2.2 COUNTRY SPECIFIC LEGISLATION AND REQUIREMENTS**

The following is a summary of key legislation pertinent to land acquisition and resettlement in each of the four CASAREM countries.

### **PAKISTAN**

- Pakistan Environmental Protection Act, 1997

- Pakistan Environmental Protection Agency Review of IEE and EIA Regulations, 2000
- Land Acquisition Act, 1894
- National Resettlement Policy and Ordinance, 2002
- Provincial Local Government Ordinances, 2001
- The Telegraphy Act, 1910
- Antiquities Act, 1975
- Factories Act, 1934
- Employment of Child Act, 1991
- Frontier Crimes Regulations, 1901
- Pakistan: Punjab Jinnah Abadis for Non-proprietors in Rural Areas Act, 1986
- Electricity Act, 1910
- The Cutting of Trees (Prohibition) Act, 1992
- The NWFP Wildlife (Protection, Preservation, Conservation and Management) Act, 1975
- The NWFP Fisheries Act/Rules, 1976
- Pakistan Penal Code, 1860
- The Convention of Conservation of Migratory Species of Wild Animals, 1979
- The West Pakistan Water and Power Act, 1958
- ILO Convention 169
- The Rio Declaration, 1992

#### **AFGHANISTAN**

- Environment Law of Afghanistan, 2007
- National Environmental Protection Agency (NEPA)
- The Law on Land Expropriation, 2009
- Mine Action Program for Afghanistan, 1989
- Law on the Preservation of Afghanistan's Historical and Cultural Heritages, 2004

- Female Rights to Land Ownership in Afghanistan
- Water Law and the Water Sector Strategy (WSS)
- Cutting of Trees (Prohibition)
- Telegraphy Act
- Antiquities Act
- Afghanistan Penal Code

#### **TAJIKISTAN**

- Nature Protection Law
- Law on Ecological Expertise
- Land Code 1996
- The Law on Migration, 1996 (article 5)
- "Framework" Environment Law, 1993
- Water Code, 2000
- Land Administration, 2001
- Land Management
- Law on Land Administration
- Law on Land Valuation
- Forestry Code
- Law on Air Protection
- Law on Hydro-meteorological Activity
- Law on Mineral Resources
- Law on Mineral Waters
- Law on Protection and Use of Animals
- Law on Protection and Use of Factories
- Law on Factories Quarantine

- Law on Health and Safety
- Law on Securing Sanitary and Epidemiological Safety of Population
- Law on Veterinary Medicine
- Law on Quality and Safety of Food
- Law on Industrial Safety of Hazardous Installations
- Law on Radiation Safety
- Waste and Chemicals Management
- Law on Production and Consumption Waste
- Law on Production and Safe Handling of Pesticides and Agrochemicals
- Water Code
- UN Convention on Biological Diversity, 1997
- UN Framework Convention on Climate Change, 1998
- The Ramsar Convention, 2000
- Convention on the Conservation of Migratory Species of Wild Animals

#### **KYRGYZ REPUBLIC**

- Land Code, 1999, 2009
- Civil Code, 1998
- Kyrgyz Republic Constitution, 2010
- The Law on State Registration of Real Estate Rights and Transactions, 1998
- Construction Regulations 02.04.84
- Law on Municipal Engineering
- Law of the KR on Denationalization
- Privatization of State Property in the Kyrgyz Republic of December 20, 1991

## 2.3 COMPLIANCE WITH BANK POLICIES TO DATE

### PAKISTAN

Comprehensive legislation on the environment, in the form of an act of parliament, is a relatively new phenomenon in Pakistan<sup>72</sup>. The National Resettlement Ordinance (2002), specifies that lacking legal title will not be a bar to compensation entitlement where in the LAA (1894) it is not specified as either. In FATA regions, the LAA (1894) or any other Government of Pakistan law does not apply. Normally land acquisition for development projects is through consultation with the Political Agents, Maliks and Tribal Elders.

The proposed CASA 1000 transmission line in Pakistan falls entirely within the FATA regions. With recent amendments to the Frontier Crimes Regulations in August 2011, it is not known how it will affect tribal autonomy apart from the approval by tribal stakeholders to allow the presence of political parties to campaign in these areas. It is fair to assume that respecting local customs and traditions will still be the norm when negotiating land acquisition. The new amendment brings with it redress for grievances outside of customary rule for FATA vulnerable populations (women, children and the elderly).

There is less guidance about compensating land-based livelihood users, and or, the economically displaced, and or, vulnerable populations.

### AFGHANISTAN

There are guidelines and frameworks to guide land acquisition processes and some aspects of resettlement in Afghanistan's Law on Managing Land Affairs 2008. There is less guidance about compensating land-based livelihood users, and or, the economically displaced, and/or vulnerable populations. Proposed project activities may have potential adverse impacts, albeit limited, on the physical and social environment. The Environmental Law is based on international standards that recognize Afghanistan's current physical and socio-political environment. Afghanistan has signed but not ratified the Basel Convention regarding trans-boundary movement and disposal of hazardous waste, and is in the process of acceding to the Convention on Migratory Species (CMS) and the Ramsar Convention on Wetlands.

The Ministry of Agriculture and Irrigation is the focal point for the UN Convention on Biological Diversity (UNCBD), the UN Convention to Combat Desertification (UNCCD) and the Convention on International Trade of Endangered Species (CITES). Afghanistan has also ratified the ozone treaties, the Vienna Convention and the Montreal Protocol, and the UN Framework Convention on Climate Change (UNFCCC).

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<sup>72</sup> MEPCO 6<sup>th</sup> STG and ELR Project (2006-07) Resettlement Plan.

## **TAJIKISTAN**

In Tajikistan, WB 4.01 is covered to a significant extent under the Law on Nature Protection (1993) and "Guideline (order, procedure) on carrying out environment impact assessment" (2006). WB OP 4.12 and 4.10 is partially covered by Law on Migration (1996) and the Land Code (1992). WB OP 4.11 is covered by the Law on Protection of Architecture Antiquity Act (1975). Laws regarding Land on Property; Law on Rent, Land Code and Housing Code covers aspects of compensation for loss property. There is little guidance about compensating land-based livelihood users, and or, the economically displaced, and or, vulnerable peoples.

## **KYRGYZ REPUBLIC**

There is some guidance in the Land Code (1999) that regulates land related issues. Currently, the Kyrgyz Republic, lacking its own legal and policy frameworks regarding LARF, will follow Tajikistan. There is no official list of signatories/agreement stating that the Kyrgyz Republic would adopt Tajikistan's legal and policy frameworks regarding LARF. There is little guidance about compensating land-based livelihood users, and or, the economically displaced, and or, vulnerable peoples.

### **2.4 LAND ACQUISITION MITIGATION MEASURES**

- In case of temporary land acquisition short-term lease agreements between the landowners and the contractors are recommended.
- Terms and conditions will be negotiated to the satisfaction of the landowners as well as the land operators through this agreement.
- Use of waste/barren land will be preferred instead of cultivatable or presently used land for carrying out the project related activities.
- Even temporary land use may affect the productivity of the land, especially in the case of productive agricultural land. After the project, the lands should be reclaimed to restore their initial productivity.
- The proponents resettlement team will be responsible to monitor the process of land rehabilitation on project completion and will ensure that land operators/owners (in case of private land) are compensated according to the terms of the lease agreements and the restoration actions agreed upon by the contractors are duly carried out.
- Rental terms will be negotiated to the satisfaction of the farmers concerned and agreements will be in their local language.
- Proponents' resettlement team will monitor the process of land rehabilitation on project completion and will ensure that farmers are compensated according to the terms of the lease agreements and the restoration actions agreed upon by the contractors are duly carried out.

- Photo-documentation of the condition of the land prior to the temporary acquisition will be made. This will be helpful in resolving any subsequent conflicts between the farmer and the contractor.
- It is now recommended that project facilities will be located at least 1000 m from existing settlements and built up areas - however, discussion with the project affected may need to be made to determine if 1000 m is agreeable or not to them.
- Prior to the commencement of construction activities, the contractor will submit a development plan to the Engineer-in charge and concerned PMU/PEO<sup>73</sup> for its scrutiny and approval.
- As far as possible, waste/barren land will be used for project infrastructures.
- The final route and tower locations will be selected to avoid any permanent land acquisition and relocation.
- In case relocation is unavoidable appropriate compensation will be paid, i.e. additional payments equivalent to 1 to 3 months rent will be paid to tenants who have to move.
- All losses (buildings/structures and other assets) will be valued as stipulated in the process outlined in Homestead Structures and other Fixed Property section above.
- Ensure that Affected People will be able to continue to carry out their agricultural activities after the installation of towers.

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<sup>73</sup> See the ESMP for definition of these roles and responsibilities

### 3. LARF GUIDING PRINCIPLES

Under these guiding principles, the CASA 1000 Project must:

- avoid or minimize resettlement using it only as a last resort;
- initiate and engage in genuine consultation with affected people, and enable their participation;
- establish a pre-settlement data baseline;
- offer to assist affected people to relocate, where resettlement occurs;
- discuss and negotiate options for fair and equitable compensation;
- follow legal requirements and international best practices when undertaking resettlement initiatives;
- specifically provide for tribal peoples, ethnic minorities and vulnerable social groups;
- consider resettlement costs as an “upfront” project cost;
- set up an independent process to monitor resettlement impacts and outcomes; and
- establish and maintain a grievance procedure for affected people.



## 4. DATA GAPS & SOCIO-ECONOMIC ASSESSMENT GUIDE

### 4.1 EXISTING DATA AND REQUIREMENTS FOR THE IMPLEMENTATION RAP PHASE

Data has already been collected and it provides a general picture of the CASA 1000 Project.

The limitations of the CASA 1000 \_Project are that detailed project affected household and community information is still needed to facilitate the RAP tasks and ultimately, the full implementation of the RAP for each country/area/regional cultural and social context. This information was not collected as part of initial environmental and social assessments.

That is, an assessment is needed of their socio-economic status and demographic information. In order to meet the objectives of World Bank, the Project needs to understand the seasonal land use patterns of the people who not only occupy the area, but who use the area. Information is needed about local decision-making protocols to develop meaningful participation and negotiation mechanisms between the project-proponent and the project-affected peoples.

Forcible evictions are not acceptable and documented proof that efforts were made to prevent this will be required.

The development of a resettlement team with a community relations officer to meet with affected communities and work with them on creating project-affected committees (please see Section 6 for Stakeholder Participation guidance) should be part of the first steps.

### 4.2 GAP: HOUSEHOLD AND COMMUNITY SURVEY DATA NEEDED

See Appendix 1 for the Baseline and Ongoing Monitoring Survey. The following items have been identified as data gaps for CASA 1000:

- Household Demographics and Family status (number of people in the household and in their care; ages, etc.);
- Seasonal resource patterns (to give us a picture of current livelihood status and the existing mutually dependent networks that which exist to make livelihood for themselves happen; a map developed with the respondent where they point out areas that they use and for what purposes in the RoW areas to be recorded by the consultant; resources/tools used to garner a livelihood);
- Housing status (seasonal or permanent, structure type, secondary structures, land title, how long they have lived there?);
- Educational status (formal or informal or skills learned special to the community/family/individual);
- Community status (social and ritual obligations, patterns of social cohesion: what is the status of networks of trust in the community);

- Conflict resolution, governing and justice (perceived decision making processes on behalf of communities and individuals: who do they usually trust to have a grievance resolved, do they have any one they can trust who is not a local leader or affiliated with the project that they could seek assistance with in case of a grievance with the project?);
- Project status (current conception about the project and perceived expected benefits, what are their major concerns?);
- Health status (physical and mental conditions and general well being, do they go without three meals a day at all throughout the year and if so when and under what conditions, where do they usually seek medical attention, deaths and births.);
- Aspirations (what are they? their perceived status of realistically reaching their goals?); and
- Financial status (how much do they generally spend in one month on all expenses: are they currently in debt? And if so, with whom?); and,
- Inventory of Assets (television, cell phone, bicycle, etc.)

#### **4.3 DATA REQUIREMENTS AND FUTURE SOCIAL IMPACT ASSESSMENTS**

##### **INTRODUCTION**

The purpose of this LARF is to guide the implementation process, not a full RAP as indicated above. A considerable amount of data still needs to be collected along with carrying out the tasks outlined above, as part of developing a full RAP for each country/area/region context. Plus, the current data is out dated and would need to be re-examined in light of world and national events in each country context. The data collected forms a partial socio-economic baseline and it will provide the basis for further investigations of a detailed SIA, once the project has been further defined.

*WB OP 4.12 stipulates: Census and survey procedures for projects with linear resettlements differ from those in most other projects in one important respect: because final technical designs often cannot be known over hundreds of kilometers by appraisal, final designs or the precise corridors of impact are impossible to determine. The remedy is either to deliberately extend the census and surveys to include the maximum envelope of impact or to estimate the resettlement impact in the areas where the route has yet to be finalized and conduct the census and socio-economic census at a later date.*

*If preliminary designs are poorly defined, the maximum envelope of impact may cut a fairly broad swath, making census and survey-taking more expensive and time-consuming. Nonetheless, identifying and enumerating the total potentially affected population and their assets will provide information for the final design process and establish a basis for entitlements, protecting the project from fraudulent or opportunistic resettlement claims. Of course, only those actually affected following final design would*

*be eligible for resettlement assistance.... As soon as a choice has been made about a corridor, a census of the potentially affected population must be undertaken.*

*The initial project resettlement estimates must be updated as soon as possible, and the planning documents must be revised accordingly.... Failure to update the RP can lead to shortfalls in financial resources, as well as imprecise monitoring benchmarks.<sup>74</sup>*

The exact number of affected structures, community infrastructures and affected persons, including tribal people, will be determined once the centerline and all towers have been finalized during the detailed design phase. Only then will it be possible to conduct the detailed evaluation and prepare the project and site specific Land Acquisition and Resettlement Plans. The Project must evaluate the proposed schedule and determine if:

- the baseline information will be gathered early, before the route is finalized, using an inclusive impact area, encompassing an exaggerated number of potential stakeholders, or;
- a more defined baseline collection endeavor will be conducted further along in the project schedule when the transmission line is nearer finalization.

In both scenarios the Project must determine where the baseline information gathering will occur in conjunction with the completion of the detailed SIA.

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<sup>74</sup> World Bank OP 4.12. 2004. Involuntary Resettlement Sourcebook: Planning and Implementation in Development Projects. Washington: World Bank Press: 315

## 5. ELIGIBILITY CRITERIA AND ENTITLEMENTS GUIDE

The persons who will be displaced by project activities are those losing assets or investments, land and property, and/or access to natural and/or economic resources as a result of permanent and or temporary land acquisition. The data previously collected for CASA-1000 does not provide sufficient information to determine if the existing entitlement matrices are deemed satisfactory by affected peoples. As such, it is highly recommended that existing categories are weighted against the household and community baseline social assessments that are required. Data show a very high concern for women's rights and their protection/privacy.

In rural areas especially, expect to be dealing with a majority of people who are deemed vulnerable populations. Vulnerable people are those who by virtue of any characteristic not of their making may be more adversely affected by resettlement than others, and who may be limited in their ability to claim or take advantage of resettlement assistance and related development benefits.

Other vulnerable people will be identified in consultation with the community. The process will be as follows. The resettlement team along with project-affected committees will play a central role in the identification of vulnerable people.

- Determine categories for qualification as vulnerable;
- Advertise the qualifications;
- Provide notice of the Project's intention to provide appropriate assistance for vulnerable people within the PAP population;
- Review each case: This will take place in an interview conducted by a Project resettlement team member, a nominated member from the local authorities and members of the project affected committee for that region/area; and

### Vulnerable people include, and are not limited to possessing the following characteristics:

- Households headed by women or children. Notably, not all female households are likely to be specifically vulnerable but many particularly those headed by aged widows, are potentially vulnerable.
- People with disabilities.
- The extremely poor. The definition of what constitutes extremely poor is difficult to establish with absolute certainty, particularly within the context of endemic relative poverty.
- The elderly - specifically households where members are not below the age of 60.

- Generate a report on the case and recommended actions. For instance, livelihood reconstruction planning may be deemed necessary and it should be designed specific to the local context.

## 5.1 EVALUATION AND COMPENSATION PROCESS

Compensation is generally the most scrutinized component of resettlement and critical in terms of the cost implications for the proponent. Thus the methodologies and outcomes in terms of valuation of procedures should be transparent. This section provides a framework for detailed valuation procedures to be developed in the RAP and in consultation with local stakeholders. The exact amount of land/number of houses and other structures that will be affected can only be determined once the location of the centerline and the towers has been finalized.

### GENERAL APPROACH AND PRELIMINARY OBSERVATIONS

The valuation of assets that may be lost during resettlement will be a sensitive issue and it should be done with care and rigor. This is of particular relevance in cases where compensation may include multiple options including replacement (land and structures) or monetary compensation. The valuation of assets generally fails when short cuts, inconsistencies and delays are made to the valuation and payments of assets.

**WB OP 4.12 provides proponents with this guidance:** *Construction of the transmission line does not require purchase of much land, but construction of associated works, such as power substations, might entail displacement. Building or widening access roads to towers can also affect property use, and restrictions on land use can affect incomes. As with compensation for pipelines, an easement fee, combined with payment for any crop damage, may be appropriate way to compensate for periodic access. Such easement fees range from 5 to 20 percent of the replacement cost of the affected land. In most cases, no compensation is paid for a decrease in property value as a result of construction of transmission lines.<sup>75</sup>*

**WB OP 4.12 also recommends:** *The partial land acquisition characteristic of many linear projects also makes it difficult to carry out accurate surveys. Often, the feasibility of making a living in the remaining area is difficult to assess. Although categories of impact (such as more than 20 percent of a plot taken) can be useful in devising entitlements, case-by-case assessment is highly recommended to ensure that households with particular vulnerabilities are not overlooked.<sup>76</sup>*

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<sup>75</sup> Ibid

<sup>76</sup> Ibid

**WB OP 4.12 also recommends:** *Compensation is normally paid just before the land is actually required. If project implementation is to be phased, the actual compensation and resettlement should not take place several years ahead of the construction phase for a particular segment of the project. Several reasons weigh against premature resettlement:*

- People are likely to resent being asked to move long before the land is actually required.
- The people displaced, or others, are likely to reoccupy the space required if too much time passes between relocation and construction.
- If compensation or assistance is paid several years before people actually move, their situation may have changed, and the assistance is likely to be regarded as insufficient. Children will have come of age; the money will have been spent; and the price of replacement land will have risen.<sup>77</sup>
- The Project should avoid making random promises to communities because villagers will become overly reliant on the Project to solve their problems. Requests from the affected communities should be considered as part of the larger planned program on community investment (discussed further in Section 5, the Entitlement Guide). Establishing a community investment strategy will help communities propose ideas that will lead to sustainable benefits, such as employment and improved agricultural technologies. This makes a cooperative relationship between project affected committees and the CASA Project itself vital towards the efficiency and sustainability of compensation and livelihood reconstruction plans in the long term.

The general approach of the valuation of procedures is summarized below:

- **Identify Eligibility under National Guidelines:** Relevant legislation, policy and valuations guidelines defined by the government in each CASA country context are provided in Part C of this document. This will form the basis for the identification of eligibility to compensation and valuation methodology.
- **Asset Survey:** The asset survey discussed in Section 4, Socio-Economic Assessment Guide will determine assets owned by affected individuals, households or communities. Preliminary and general data are available.
- **Valuation Methodology:** The valuation process will involve the assessment of national guidelines, international best practice and local market research. The outcomes of this process should be a set of practical and measurable values/rates for each asset category.

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<sup>77</sup> Ibid

- Entitlement contracts: Contracts will be produced for affected individuals that will contain a summary of all their assets, adopted compensation rates or options and final valuations.
  - Develop an auditable database of compensation payments that allow for easy determination of benefits and payments made.
  - Disclose the amount of payments to affected individuals in written form. The following information should be disclosed:
    - Name of affected person, amount of payment by asset
    - The deadline and procedure for filing a counter claim or lodging a complaint, and the final deadline by which all claims are to be settled. An appropriate time period for each deadline is thirty days. Enforcing a firm deadline will protect the Project from spurious claims and ongoing complaints that prevent the project from moving forward. It is vital that efforts are made by the Project to process claims quickly and fairly as possible so to devote attention toward benefits that will improve the welfare of whole communities and not just specific individuals.

## 5.2 ASSETS VALUATION

The following sections provide generic valuations of different assets that would be relevant to this project. These valuations should only act as a guide and considerable revisions will need to be made prior to adoption. Affected land owners may sign a sell/purchase agreement with the Project where the compensation amount includes land and all associated structures.

### HOMESTEAD STRUCTURES AND OTHER FIXED PROPERTY

In the valuation of homestead structures and other fixed property, the following steps will be followed:

- Undertake a detailed asset inventory of all persons, possessions, and assets found at individual households as discussed above and building on current information.
- Determine values or compensation options for dwelling structures and other fixed property. Options may include rebuild and/or cash payment and the final choice should rest with the household.
- Determine the needs of the household and replacement structures with regard to potential issues arising out of space required to accommodate polygamous family arrangements, etc.
- Determine the compensation package for each affected individual according to valuations and preferred options. This package should be signed by the affected individual and a community representative (project affected committee member).

- Where there is dispute within the household such dispute will be referred to a grievance and the dispute will be referred to a grievance and disputes committee.

The valuation of physical structures will be based on the following general criteria:

- Survey of physical structures (size, build, materials) and all its related structures and support services.
- Determine average replacement costs of different types of structures based on information on the cost, quantity, and type of materials used for construction (e.g. bricks, rafters, bundles of straw, doors).
- Costs for transportation and delivery of these items to acquire/replace land or building site.
- Estimates of construction of new buildings including labor required.

In terms of compensation for physical structures lost due to resettlement, two major options are provided:

- The first option is for the Project to rebuild houses using a contractor under its supervision and will replace all structures on the homestead plot. Under this option, compensation will be paid by replacing lost structures (irrespective of the title or lack of title that pertains to the affected household) with structures of similar or better quality. Two sub options are envisaged here. The first would include re-building all primary dwellings and any additional outbuildings, latrines, fences and other impacted structures. Replacement structures will be rebuilt on the acquired replacement land.
- In the second option cash compensation may be provided for smaller auxiliary structures but this would be for minor structures.

Option two is the recommended option and is less onerous. In terms of this option it is recommended that the Project will replace the main dwelling structure of the household in lieu of a cash payment. The design should reflect community preferences, applying traditional architecture and locally available materials. The majority of labourers should be recruited from the local area.

**Non-residential Moveable Structures:** These include sheds and verandas of various kinds. These structures are usually almost entirely moveable, and as long as the owner will be able to salvage the materials, the loss will be very limited. Cash compensation at full replacement value is recommended and is mainly intended to cover the labour needed to dismantle and re-establish the structure elsewhere.

**Non-residential Immovable Structures:** These include latrines, kitchens and other dwelling structures. The compensation at full replacement value plus 15% is recommended as this has proven to be acceptable in past projects around the world. This is mainly intended to cover the labour needed to

build the structure at the new site. Non-residential structures that would not fall in one of the above categories will be valued and compensated on a case-by-case basis.

As indicated, the Project will through a formal contractor (or with local builders supervised by an accredited individual), undertake to rebuild peoples' main structures. The main advantage of this option is that the Project has control over the building process and can ensure quality, and thereby guarantee the structure.

In terms of the replacement of other household structures it is recommended that:

- The household is responsible for the replacement of all other structures.
- The Project will pay cash compensation at replacement cost plus 15%.
- The homestead will be entitled to salvage all movable materials and this will not be deducted from the compensation calculation.

To ensure that the move from the original homestead to the new one is as smooth as possible it is recommended that:

- Resettlers are required to move to the new homestead within three days of notification of house availability by the Project following construction (inclusive of all finishings) of the replacement house.
- To assist with resettlement, transport should be made available by the Project to each homestead sufficient to move the family and belongings to their new residence. The day after the second truck and team has removed any moveable assets, the Project has the right to demolish the structure. As such, the Project will assist with the transport of:
  - Resettlers' temporary structures from the homestead to their new homestead. This material may include roofing materials, structural wood, doors, security screens and windy frames.
  - Livestock, food, seed, planting materials and personal effects.
  - The Project will not be liable to pay for, nor assist with the transport of any brick or mortar, firewood or vehicles.

After moving to the new homestead, the resettled individuals will agree to forego all claims and rights in relation to the previous homestead. The household head should sign a document to this effect. All trees and materials left at the old homestead site then become the property of the Project.

After taking occupation, the resettlers will be visited by the Project's resettlement team to compile a list of building defects, if any. The resettlement team will guarantee the structure of the primary concrete dwelling for five years. This guarantee covers the structural integrity of the house, base, walls, toilet

building and roof. It does not include doors, windows, guttering and water tank or the maintenance of a toilet pit. The Project is not responsible for structural problems arising from the occupants building onto or modifying the structure.

With regard to community and/or social buildings, and to ensure that no resettlers are worse off after the resettlement process, it is recommended that all existing community and/or social buildings and structures be replaced (if affected within the COI).

For partially built cement brick/block houses it is recommended that:

- The Project compensates households for the lost materials in partially built houses.
- The amount of compensation will be calculated on the value of the materials in the structure and plus the value of labor.
- The Project does not compensate households for abandoned structures.

Under this option no homestead will be moved by the Project prior to replacement or without suitable housing being made available. Compensation will be made for structures that are:

- Within the development area.
- Directly damaged by construction activities.

A second option is to replace houses by giving a cash payment equivalent to replacement value of the structures being lost. Critical here is that for this to be WB 4.12 compliant value must be replacement and not market. Where households choose the cash option, they should be counselled as to the consequences and sign a waiver indicating that all adult members of the household are in agreement that cash option is preferred. This is not the preferred option and homesteads should be counselled against pursuing this option.

## **LAND**

Permanent land acquisition for a transmission line project will be minimal. However, temporary land acquisition will be required for construction activities.

## **PAKISTAN**

As per Telegraph Act, 1910, NTDC does not acquire land for implementation of the transmission projects. Thus no payment is made for the land at the tower footing as the landowner is allowed to use the area under the towers. Normally people utilize the land at tower footings for agricultural purposes where agricultural activities already exist. State law is not acknowledged in the Federally Administered Tribal Areas. In case, land needs to be acquired, the LAA 1894 and the National Resettlement Ordinance 2002 recognizing usufruct rights will address both land classifications and guide the process of compensation (see Stakeholder Consultation, Section 6 for guidance on reaching an agreement with

project affected committees). The long-term impacts can be minimized by adopting mitigation measures as set out in Part D of the ESMP and this LARF.

There will also be need for Temporary Land Acquisition for:

- Contractors' camps and facilities, i.e. storage, workshop, equipment parking and washing areas, and access roads for haulage, etc. The approximate area required for one contractors' camp will be 2, 500 m<sup>78</sup>.

## **AFGHANISTAN**

No land needs to be permanently acquired for the installation of transmission line projects. People will be able to continue to carry out their agricultural activities after the installation of towers.

There will also be need for Temporary Land Acquisition, the procedures presently adopted by the government of Afghanistan will be followed for both private and collective land including consultations with "meshrano (elders) and wolesi (peoples) jirgas". Some temporary land will have to be acquired for contractors' camps, storage areas workshops, equipment parking, and access roads. The area required for establishment of each camp will be 2,500 m<sup>79</sup>. In all cases, the price of land will be determined as per current market rates and also by land use category.

No religious, cultural, and historical structures have been identified.

- **Temporary Land Acquisition of Land**

Land for construction campsite will be temporarily acquired directly from land operators/owners.

## **TAJIKISTAN AND THE KYRGYZ REPUBLIC**

The Tajik Republic has approved procedures for land allocation. Under the Law on Property, while all land belongs to the state it is allocated for lifetime use by individuals/farmers. In case it is required for a development project local authorities shall compensate the loss with comparable land within the limits of the same administrative territory.

The Government will issue an appropriate decree for reallocation of land in acquisition of land for erection of towers and no payment will be made for the land at the tower footing as the land owner is allowed the use of the area under the towers. Normally people continue to use the land under the towers for agricultural purposes where agricultural activities already exist. Judicious routing of the T/L

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<sup>78</sup> See the ESMP for definition of these roles and responsibilities

<sup>79</sup> See the ESMP for definition of these roles and responsibilities

within the corridor will minimize the amount of land, number of houses and structures that will be affected by the T/L.

Some temporary land will have to be acquired for contractors' camps, storage areas workshops, equipment parking, and access roads. The area required for establishment of each camp will be 2, 500 m<sup>2</sup>.

- **Agricultural Land**

There is agricultural land (cotton fields and orchards) that will be under the transmission lines. While potential damage caused by tree cutting and construction of temporary roads during the construction activity is a concern, this can be minimized by careful routing of the centerline and selection of tower locations during the final design. All construction work will be done during the period when plantations and croplands are not in their productive phase and they will be rehabilitated after completion of construction works. The relevant costs for rehabilitation works should be included in bid documents.

- **Land Tenure**

In Tajikistan, all land is state-owned. Land use is directed/permitted by the State through district administrations (Hukumat). Inheritable land use rights provided for under Tajikistan's land tenure reform, but the process is at a very early stage of implementation. Tajikistan's Land Code addresses potential compensation for people who legally occupy government land and are forced to relocate, but the Land Code does not address compensation for people who are illegally occupying government land and are forced to relocate.

## **CROPS AND TREES**

In a rural setting, the valuation of crops, trees, and other natural resources is an important step and is generally costly. If crops or trees are acquired by the Project, then compensation is due prior to construction and displacement. The affected communities should be given information about the procedures that will be used for the counting of trees and crops, the methodology applied in their valuation, rates of compensation, timing and delivery of compensation, and grievance mechanisms. Notably, procedures should be in place so illiterate and/or elderly land users fully understand the assessment process.

For trees the compensation rates will be based on information obtained through comparing market rates with government rates. The higher the rate will be paid. Only productive trees will be compensated for. An alternative is to provide a seedling and to pay the tree owner an annual sum to compensate for the lost production for the period that tree requires coming to full maturity.

Standing crops that are acquired should be assessed according to government rates/market rates for the different crops. Again the higher of the two should be paid. The crop owner/farmer will be paid the rate by the number of crops acquired or the acreage covered. It should be noted that international

practice usually allows any standing crops to be harvested even if the family may have physically moved to their new location.

Actual loss of crops and trees during the construction period will be assessed once the location of the centerline and the towers, construction methods and schedule are determined. This will be done by the Project's contractor/consultant who will prepare the detailed design and construction plan.

## **GRAVES**

In the period leading to implementation the following guidance is provided:

Should graves be found the general principle is that the exhumation and re-burial of individual graves will only commence following the resettlement of associated families. When this occurs the Project will:

- Make exhumation and re-burial arrangements with local entities (municipality, and traditional leaders, as well as religious leaders).
- In consultation with the local authorities, identify land for the purposes of preparing such land as a formal re-burial within the designated cemeteries or where the homestead so chooses. Homesteads may alternatively choose to re-bury people on or near their resettlement plot. Providing this does not contradict any by-laws or customary restrictions, this should be permitted.
- Negotiate the timing and arrangements for the relocation and re-burial of the deceased with the affected family and record the outcomes of this negotiation.
- Meet the following costs:
  - Exhumation, transport and re-burial (re-interment) of the deceased.
  - Provision of a cloth-lined coffin. An approved supplier will provide the coffin.
  - Provision of a flat rate per grave to satisfy any customary cost.
  - All works associated with the burial.
  - A replacement tombstone where such exists on the site exhumed.
  - The family will organize ceremonial process in accordance with its religious beliefs and/or custom and uses.
  - The Project will inform the communities, and all other relevant authorities, when the resettlement and grave relocation process is completed.

## **COMMUNITY INFRASTRUCTURE**

Public infrastructure such as electric poles may have to be moved during the construction of the T/L. The final identification of the infrastructures that will be moved can only be determined once the location of the centerline and the towers have been fixed during the final design phase of the project development. This will be done by the Project's contractor and the consultant or resettlement team.

In the event that this does occur, community infrastructure and resources will need to be replaced as part of the resettlement process. The valuation of community structures and resources will require additional consultation with community leaders, committees or individuals that have responsibility over any community structures or natural resources.

The resettlement process would need to commit to the replacement of the community infrastructure in such a manner that maintains existing community services. Such replacement should be equal or ideally better than what is being replaced. Furthermore, due consideration will be needed in terms of the appropriate location of the replacement structures and its catchment (i.e. pupils for schools). Valuation guidelines for community infrastructure include the following:

- Ideally, the replacement of community infrastructure should be undertaken in consultation with the local community, any host communities and the relevant authorities. The latter is perhaps the most critical authority (e.g. health departments) should maintain overall responsibility of community infrastructure with support from the Project.

## **BUSINESS AND ENTERPRISES**

The Project would need to compensate the affected business or enterprise for the cost of re-establishing the commercial business at a new location. The valuation would need to consider the following guidelines:

- Determine and survey all commercial businesses and described function, intensity of use, locational importance and its market catchment.
- Valuation should be based on the cost of re-establishing the commercial activity at a new location. This may include costs for:
  - Lost net income and where business profits may be affected compensation will be paid according to audited results of the enterprises monthly income.
  - Similarly, lost wages will be determined through enterprise audit.
  - Acquisition of new land.
  - Material and construction costs of replacement structures.
  - Costs of transfer.

- Ideally the replacement of commercial businesses should be undertaken in consultation of the business owner.
- During the construction phase of the project, there will be some loss of income for local farmers but this will be localized and restricted to some tower locations and temporary access roads. These people will need to be properly compensated for through consultation and negotiation with the affected vulnerable peoples.

### **5.3 HOST SITE AND LIVELIHOOD RECONSTRUCTION**

#### **INTRODUCTION TO LIVELIHOOD RECONSTRUCTION**

The above sections set out the mechanisms through which compensation can be calculated and to those protected under the RAP. According to the World Bank, however, resettlement involves more than compensation. The Project is also expected to take active steps to ensure that livelihoods are not negatively affected. At present there is not enough information available on the CASA project to indicate who will be economically displaced or what options the Project might offer. These details will become more evident once the proponents have conducted a thorough household and community baseline social assessment.

Compensation entitlements are just one mechanism of restoring incomes. Ultimately, compensation alone does not guarantee the restoration or improvement of living standards. The World Bank advises project sponsors to support community development projects that will lead to a long term and sustainable improvement in the standard of living of affected communities. Such community development projects should build upon and maximize existing material, cultural, and human assets to increase local ownership of the projects and encourage self-sufficiency in the communities. This process speaks to the importance of conducting a thorough social assessment of peoples land use and occupation of affected areas from the start. To the greatest extent possible, communities should participate actively in the design and implementation of community based initiatives. Further, the affected communities should hold major responsibility in the maintenance of facilities and continuation of programs.

It is highly advisable that the Project work in consultation with the PAC to develop community investment strategies that clearly state the objectives of future community investments, the types of activities eligible for financing, the roles and responsibilities of the Project, the local and national government units, affected communities, and associated parties (NGO's and Universities for instance), and the size of the investments. After a strategy has been agreed upon, the Project and the PAC, with the involvement of the local and national government units responsible, should explore the feasibility of several community investments. Both the strategy and Community Development Plan should be based on the most critical needs affecting the communities.

## 5.4 HOST SITES

There is no indication that host sites will be required. However, whether a new resettlement site has an existing host community or not, the following points need to be considered:

- Resettlement requires the physical relocation of people to a new site or location. The process to identify and select a resettlement site should be transparent and include consultation with the affected households and if relevant, the host community.
- In selecting a resettlement site, these factors should be considered: location, access to natural resources, maintenance of community structure, continued access to existing economic activities, impacts on host communities, land ownership and tenure rights.

As indicated in previous reports, there will be impacts on people's agricultural practices and therefore active measures to alleviate poverty should be undertaken, including evaluation and compensation as outlined in this Section.

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## 6. STAKEHOLDER PARTICIPATION GUIDE

### 6.1 CONSULTATION, PARTICIPATION AND GRIEVANCE MECHANISMS

#### OVERVIEW

Consultation for resettlement has two aspects. The first is the timely dissemination of information regarding the project and its resettlement component. This aspect of consultation is a one-way process in which project staff and sponsors provide information to the public. The second aspect involves a two-way exchange of information that gives stakeholders a chance to air their concerns and have a voice in the actual planning of the resettlement. It is this second aspect that is the most important in resettlement planning and implementation.

It is vital to the success of resettlement and compensation programs to encourage the participation of and consultation with the affected community and authorities. WB OP 4.12 specifically states, as a policy objective, that "displaced persons should be meaningfully consulted and should have opportunities to participate in planning and implementing resettlement programs" (paragraph 2[b]). Public consultation and participation allow the project managers to design resettlement in a way that benefits affected peoples. Effective consultation can also assist in reducing the costs of implementing the RAPs by avoiding implementation that is contrary to the needs of the PAPs and which does not breed antagonism towards the project by withholding information. Consultation is an ongoing aspect of the resettlement process that takes place through every stage of resettlement planning and implementation as the project proceeds.

Broadly defined, stakeholders include any individual or group who feels that they are going to be affected by the project, and any individuals or groups who may significantly in affect or shape the project, whether in a positive or negative way. In narrower terms, Project Affected People (PAPs) are those individuals and groups who are directly affected by the project through the loss of assets and/or land, or through disruption or loss of livelihood.

From an early stage the project management should identify all stakeholders in the project, who may include:

- Project Affected People
- The Developer
- Local Authorities (Municipality, Government Departments)
- Local Businesses
- Resident Associations
- Individuals who feel that the creation of the project or the resettlement process will have an impact on them (whether positive or negative)

## 6.2 PROJECT AFFECTED COMMITTEE(S)

Given the difficult nature of coordinating a linear development project that crosses numerous administrative jurisdictions and country contexts, a village/area centered approach has been adopted as best practice. This involves setting up committees in project affected areas that include stakeholder representation that will be responsible for drawing up the RAP and implementing resettlement. Establishing these project affected committees (PACs) should be part of a broader process of engaging stakeholders, which can only be determined once all of the stakeholders have been identified. The PAC is not a statutory body but advises on all community-related issues and forms part of the consultative process for the RAP.

The PAC should meet as often as deemed necessary. Following standard accepted practices, it should make relevant documentation available to interested and affected parties. The PAC should also make such records, as well as minutes of meetings, available to the external independent monitoring team.

The PAC will act as the primary advisory body in all matters related to resettlement. It should be constituted in such a manner as to be regarded as the primary representative voice of those affected by resettlement and should be recognized by all stakeholders as such. Under the overall authority of its chairperson (elected by the group itself), the PAC should have the following functions:

- To act as the primary channel of communication between the various interest groups/organizations involved in the resettlement process. In particular, to facilitate communication between the Project and the affected populace.
- To act as a forum in which the Project can consult on various resettlement aspects.
- To debate the Entitlement Framework for each RAP and make recommendations as to how to ensure equity to all parties involved in the resettlement process.
- To serve as the court of first appeal to solve any grievances that arises relating to the resettlement process. The first step being for the PAC to approach the Projects directly along with the complainant (individual and or household). If the RAP is unable to resolve such problems, it is to channel them through the appropriate grievance procedures.
  - The PAC after having exhausted these initial redress mechanisms directly with Projects have the option to make their complaint, as a committee, in writing, to the World Bank Inspection Panel.
- To have primary responsibility for assisting the Project to oversee the resettlement process in all its phases.

The consultative body should be constituted and run in such a way that the affected constituencies are adequately represented and fairly heard. This ensures that the affected community's concerns and

suggestions are taken seriously by the project. The Project should appoint a community liaison officer in the pre-implementation phase to oversee the establishment and then the running of the PAC.

### 6.3 GRIEVANCE REDRESS MECHANISMS

Even when the project can ultimately claim successful resettlement, there may still be individuals and or groups who feel that they have been treated inadequately or unfairly. Providing credible and accessible means for PAPs to pursue grievances allows the project to address genuine issues in a timely manner and decreases the chances of overt resistance to the project from disgruntled PAPs.

Grievances relating to any aspect of the project must be dealt with through negotiations aimed at reaching consensus between the project and the affected parties. A procedure addressing how to submit grievances and how the Project will manage them should be established for each specific cultural/social context. Guidelines to govern this process are described below.

The grievance process must be made known to stakeholders. Grievance boxes should be located in a number of points within the project area, and a custom designed grievance book should be created. A grievance process should incorporate the following steps:

**Step 1:** Receipt of grievance: The Project's community liaison or resettlement officer receives the grievance either verbally or in writing. The grievance will be entered in a complaints register and the person submitting the grievance will be given a receipt acknowledging his/her submission. People should also be given the option of making their initial complaint through the PAC and the community liaison officer upon receipt of the complaint from the PAC (representing the complainant) should provide a receipt acknowledging their submission.

**Step 2:** Assessment: The resettlement officer or community liaison officer will assess the grievance in terms of whether it can be resolved locally or whether it needs to be taken to the Project for further action.

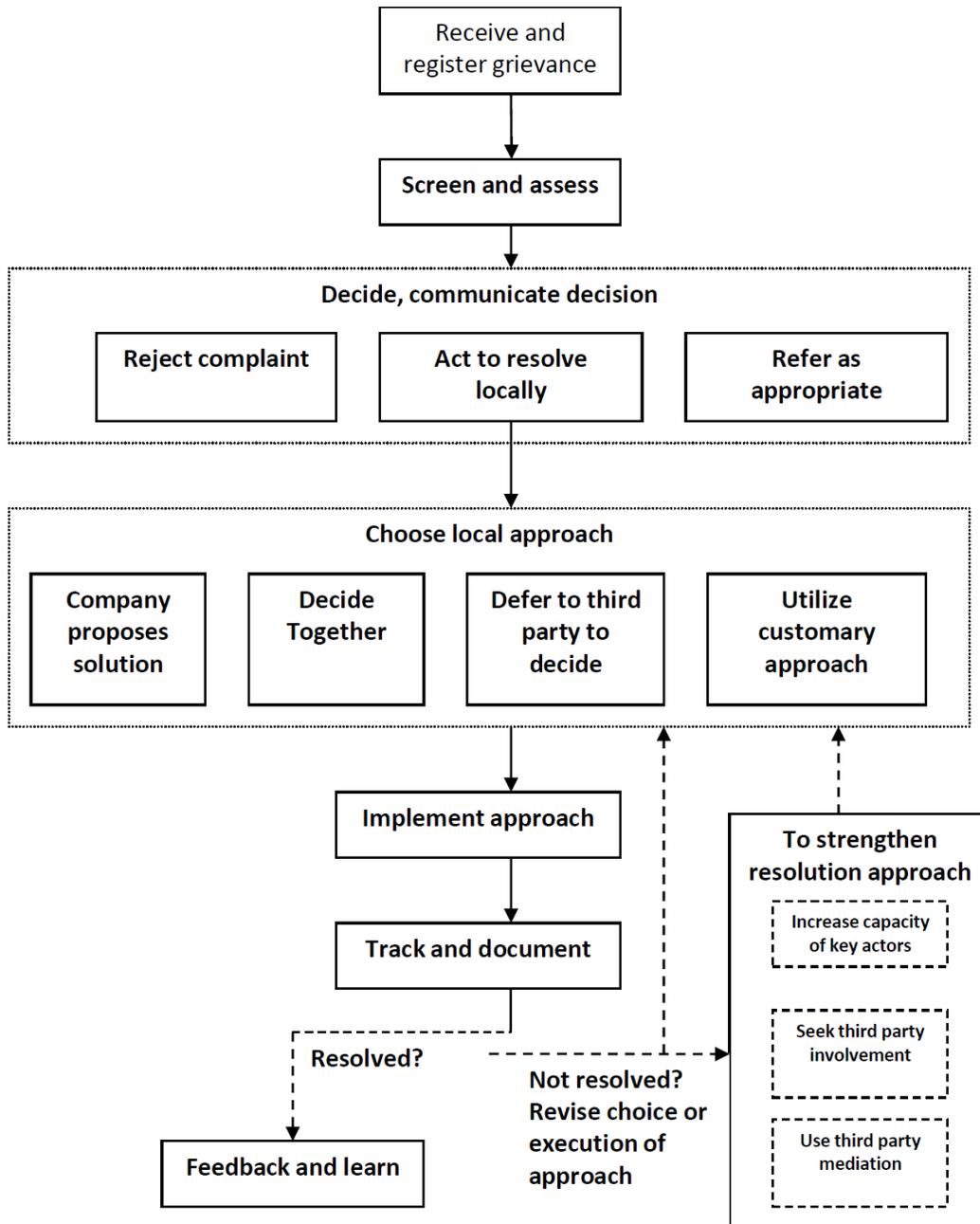
**Step 3:** Acknowledgement of complaint/grievance: Written information (accompanied with verbal explanation) as to steps that will be undertaken to resolve the grievance and the expected time for its resolution will be provided to the complainant within two weeks. This exchange will be recorded in the register.

**Step 4:** Investigation and resolution of grievance: The Project will conduct an investigation to determine the underlying cause of the grievance and any changes required to internal systems to prevent recurrence of a similar grievance. As appropriate, the Project will also hold meetings with the person/group expressing the grievances to discuss, clarify and solve the issue, and to prevent it from recurring.

**Step 5:** Closure: Once the investigation has been completed and necessary measures have been taken, the results will be communicated to the complainant and entered into the register.

**Step 6:** Outcome of the corrective action is verified with the complainant: Following completion of the corrective action, the appropriate community liaison officer or resettlement officer will verify the outcome with the complainant. The complainant will be asked to sign off on his/her acceptance of the 'solution' (or nominate someone to do so on their behalf). In the event that the complainant remains dissatisfied with the outcome, the Project may agree to carry out additional corrective action.

**Figure E6-1: Proposed Grievance Mechanisms Process based on IFC Compliance Advisory Ombudsman Recommendations**



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## 6.4 INSTITUTIONAL ARRANGEMENTS FOR IMPLEMENTATION

### INSTITUTIONAL ARRANGEMENTS

The Project will provide the financial resources necessary for the resettlement and compensation process and will provide significant additional managerial and technical expertise. The role of the Project may be broken down into two distinct phases: pre-implementation and implementation. These processes will need to be further refined during the resettlement planning phases specific to each country/area/regional context.

#### Pre-Implementation Role

During the pre-implementation, the Project must ensure that it has:

- Collected all data required to effect resettlement.
- Draw up Terms of Reference and contract for all major planning services needed to effect resettlement.
- Put in place a project management system and financially support the development of a land-use plan for the project.
- Attend consultative meetings and provide administrative support and managerial and technical support where required.

#### Implementation Role

In the implementation phase, the Project must continue to finance implementation of the RAP. This will be done via the establishment of a designated resettlement team. The primary responsibilities of the team are:

- Drawing up compensation /resettlement offer documents for each individual household affected.
- Managing compensation and resettlement payments.
- Ensuring that the principles of the RAP are respected.
- Providing technical and managerial input for implementation of the RAP.
- Establishing a socio-economic monitoring program for the affected households.
- Identifying households that are "failing" as a result of the resettlement impacts of the project, and, together with the relevant local authorities, defining and implementing corrective actions.
- Attending consultative meetings and providing support and input when required.

- Addressing compensation and resettlement grievances.
- Defining and implementing monitoring program to ensure that affected households are not worse off in the post-implementation phase.

Ensuring compliance with the resettlement and social commitments will be the responsibility of the manager of the resettlement team. The precise nature and composition of the resettlement team will be spelled out in each context-specific, final RAP.

However, the responsibilities of the resettlement team will generally include daily operational activities to oversee the execution of the RAP, including the following specific program components:

- Survey and value assets appropriated during project construction.
- Conduct census updates of affected households.
- Plan and supervise compensation activities, including for lost crops, land buildings and livestock, and restoring livelihoods.
- Coordinate selection of alternative resettlement sites.
- Monitor and report on the construction of replacement village structures.
- Plan and coordinate the move into replacement housing for affected parties.
- Supervise ongoing consultation with affected parties

The Community Liaison Officer will serve as the primary point of contact between communities of the area and will have the following primary areas of responsibilities:

- Liaise with local government and with appropriate Project personnel regarding local community issues.
- Assist with ensuring compliance with Project policies.
- Log and respond to grievances lodged by members of the communities.
- Assist in identification of individuals to receive compensation as a result of intended or accidental damages as required by law and as prescribed in internal procedures.
- Together with the resettlement team, organize and facilitate compensation payment actions.
- Obtain prior written permission from community leaders/affected members for any intended damage to any infrastructure, crops or land as a result of project-related activities.

## 6.5 LOCAL GOVERNMENT UNITS/AGENCIES

National government bodies and local agencies are the preferred primary support agents to the Project when implementing resettlement programs. The Project will work closely with local authorities and traditional leaders who represent governments in each country. Representatives from such government agencies will be expected to carry out the following key responsibilities:

- Act as the primary government representative.
- Ensure that the government supports the Project in providing assistance to relocated households as and when required.
- Ensure that moratoria on settlement within project-affected areas are observed.
- Ensure compatibility of the resettlement process with the overall development visions for the area.
- Ensure that the Land Use Plan for the host resettlement area meets legislative requirements.

### RECOGNIZED COUNTRY SPECIFIC LARF RELATED AGENCIES

#### PAKISTAN

- Malik and Jira Village-level governments
- Ministry of Environment
- Provincially Administered Tribal Areas Department of NWFP
- Department of Agriculture, University of Peshawar
- NWFP Wild Life Department
- NWFD Forest Department
- Khyber Forest Division
- National Highway Authority
- Irrigation and Power Department
- Environmental Protection Agency, Peshawar
- GOP Political Agency

#### AFGHANISTAN

- Community Development Councils

- National Environmental Protection Agency
- Ministry of Agriculture, Irrigation and Livestock
- Supreme Court of the Islamic Republic of Afghanistan;
- Community Shuras or Jirgas (Local Village Government Organizations)
- Ministry of Finance
- The General Department of Geodesy and Cartography
- Afghanistan Land Authority
- Department of Mine Clearance
- The Mine Action Coordination Centre of Afghanistan
- Ministry of Energy and Water
- Ministry of Interior
- Land Administration Agency
- Provincial Councils
- District Councils
- Municipal Councils

#### **TAJIKISTAN**

- Oblast Jamoats (Local Village Government Organization)
- Committee for Environmental Protection (CEP)
- National Level NGO's
- Journalists
- Civic Society

#### **KYRGYZ REPUBLIC**

- Ayil Okmotu (Local Village Government Organization)
- Ministry of Water Resources and Land Reclamation
- Committee for Environmental Protection (CEP) (Government of Tajikistan)

- Gosregistr (State Agency on Registration of Estate Property Rights under the Government KR) with its district branches
- Ministry of Agriculture, Irrigation and Food Industry

## **6.6 CONSULTATIVE FORA**

The consultative fora are the primary channels of communication between the Project and the respective government agencies. They meet as necessary and will continue to meet for the duration of the resettlement program. In addition to acting as a conduit of information, the fora have the following key outcome objectives:

- Ensure that the terms of the RAPs are followed.
- Monitor the implementation of the RAPs and suggest modifications if and when necessary.
- Identify issues/areas of concern that may have been overlooked or under-emphasized in the SIA or RAPs and suggest ameliorative and or mitigation measures.
- Assist in finalizing a land-use plan for the resettlement areas and community resource aspects.
- Facilitate land acquisition in areas under its control, i.e. both in the project areas in the host resettlement area.
- Agree on the principles of a means test to determine which households qualify for extended support.
- Monitor the project area so as to prevent illegal encroachment.



## 7. MONITORING GUIDE

### INTRODUCTION

Monitoring is a critical part of a resettlement project. Monitoring is required in order to assess whether the goals of the resettlement and compensation plan are being met. It involves the systematic use of information to determine the extent to which plans are being implemented effectively. The database developed from the information gathering activities outlined in Section 4 of the Data Gaps & Socio-Economic Assessment Guide, provides a baseline against which all standard World Bank indicators for resettlement can be monitored. A monitoring plan should include monitoring criteria, identified milestones, and an outline of the resources needed to carry out the monitoring.

However, monitoring must take into account the changing conditions within each project site, and allow for planning and implementation revisions that respond to such changes: "Because of the myriad social and economic contingencies that arise during the project implementation, resettlement is better conceived not as a rigid blueprint, but as a learning process in which tentative plans are adapted responsively to unfolding obstacles and opportunities" <sup>80</sup>.

The monitoring plan will include two levels of monitoring: internal and external independent monitoring.

Internal Monitoring, also known as performance monitoring, allows the project management (or agency elected to implement the RAP) to measure physical progress against milestones set out in each RAP. The WB emphasizes that internal monitoring mechanisms are particularly helpful in a linear project covering long distances because the Project cannot track developments in all areas, even if it has the expertise to do so. A reporting system is therefore crucial if the central office is to keep abreast of local developments.<sup>81</sup> . It is good practice for the Project to monitor implementation and the delivery of compensation through a combination of local administrative units and the project affected committee. It is important to keep in mind that "inflation puts pressure on local officials, so monitoring helps verify payments" <sup>82</sup>.

Internal monitoring will:

- Ensure that due process has been followed to notify stakeholders, and that adequate public meetings have been held.
- Verify that there are no outstanding or unresolved land acquisition issues regarding the project or any of its subprojects, that the census of all PAPs has been carried out, that the RAPs and

<sup>80</sup> World Bank OP 4.12. 2004. Involuntary Resettlement Sourcebook: Planning and Implementation in Development Projects. Washington: World Bank Press: 205

<sup>81</sup> Ibid: 318

<sup>82</sup> Ibid

socio-economic survey has been prepared, and that property valuation and resettlement has been carried out in accordance with the provisions of the RPF.

- Maintain records of any grievances that require resolution.
- Ensure that all resettlement measures are implemented as approved by the project management and relevant local authorities.
- Verify that funds for implementing resettlement activities are provided in a timely manner are sufficient for their purposes, and are spent in accordance with the provisions of the RAP.
- Document timely completion of project resettlement obligations (i.e. payment of the agreed-upon sums, construction of new structures, etc.) for all permanent and temporary losses, as well as unanticipated, additional construction damage, while updating the database with respect to any such changes.
- Ensure that monitoring and evaluation reports are submitted routinely, beginning early in the implementation process, during mid-term implementation, and post implementation for at least two years - dependent on the area/region/country context.

External and Independent Monitoring tracks the effects and impact of the project. It should be conducted every six months for at least two years following resettlement (or more, depending on livelihood reconstruction plans) and should be carried out by an independent consultant (preferably with resettlement experience), academic or research institution, or NGO. An external monitoring protocol should be designed during creation of the RAP. Redress for external and independent monitors (if deemed necessary) exists through the WB Inspection Panel.

Both internal and external independent monitoring reports provide valuable tools for identifying problems in the implementation of the resettlement project, and should be used to assess whether any changes need to be made to the RAP. Project management should meet after each monitoring evaluation to discuss the findings and assess whether steps should be taken to rectify issues that have been highlighted.

Indicators used in monitoring are based on the World Bank's standard suite of variables required for measuring resettlement impacts. These variables include:

**Agriculture:** food production and marketing:

Crop production (tonnage or bushels per hectare and type of land use).

Livestock per household.

Incidence of animal disease/type.

Farmers' groups, involvement of women.

**Education:**

Where applicable, primary and basic enrolment levels by gender.

Secondary (and possibly tertiary) enrolment levels by gender.

Pupil/teacher ratio.

Distance to primary school.

**Health:**

Availability of and distance of safe drinking water and sanitation.

Incidence of main diseases/gender/age.

Death rates of main diseases/gender/age/

Trained health staff/catchment population.

Distance to health centre.

Child nutrition: height for age (stunting), weight for age (wasting).

Possibly incidence of HIV/AIDS and of other STDs by gender and age.

**Household Economy:**

Housing, quality of roof, walls, floor.

Road to next village, footpath, dust/motor road.

Income per households.

Indebtedness.

Suite of assets owned (e.g. radios, bicycles, iron bedsteads, televisions, etc.)

Capacity building, skills/vocational training.

Community infrastructure.

Improvement in production/income for women/youth.



## **8. BUDGET FOR RESETTLEMENT**

The CASA 1000 Project will need to develop resettlement budgets specific to each resettlement plan and to update them regularly. External factors such as inflation can upset original budget calculations, and local agencies may find themselves expected to carry out the contracted tasks within the original budget even though the actual costs may have risen significantly. Central project management can learn of such unexpected variations in compensation and other assistance only through periodic and independent monitoring. (WB 4.12 2004:319) Current estimates for land acquisition and compensation entitlements proposed in 2008 are now out dated. These cost estimates will have to be revised once the final tower selections have been made. These revised estimates will need to be developed through meaningful consultation and negotiation with project affected people as well as consultation with market research experts.



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## PART F: CONSULTATION GUIDE

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## 1. INTRODUCTION

The Consultation Guidance Plan (CGP) is a guidance tool to assist the four CASAREM countries in the dissemination of the CASA 1000 (the Project) information to potential stakeholders and retaining stakeholder feedback to be considered for Project design. It is expected that this stage of consultation would be performed by each CASAREM country's government created In-country Consultation Team (ICT).

The CGP is created to specifically provide guidance for the consultation that is to occur after completion of this ESIA ESMP: Feasibility Stage. This CGP recognizes that some consultation has occurred previously during the IESIA but this is deemed insufficient for the go-forward process. The CGP may be used to provide guidance for ongoing consultations in future stages of the Project.

This phase of consultation will correspond with the ESIA and ESMP of the Central Asia South Asia Electricity Transmission Project (CASA 1000): Feasibility Stage document (ESIA/ESMP). Expectations are that the ICT stakeholder consultation will occur in the short term future, likely before the completion of 2011. The resulting feedback should be used by Project parties in the appraisal process going forward.

Project financing requirements may necessitate a future full environmental and social impact assessment and corresponding consultation to be completed by the Contractor, or consultants, in conjunction with the construction planning and detailed T/L engineering design.



## **2. CONSULTATION PLAN OBJECTIVES, PRINCIPLES AND BEST PRACTICE**

### **2.1 OBJECTIVES**

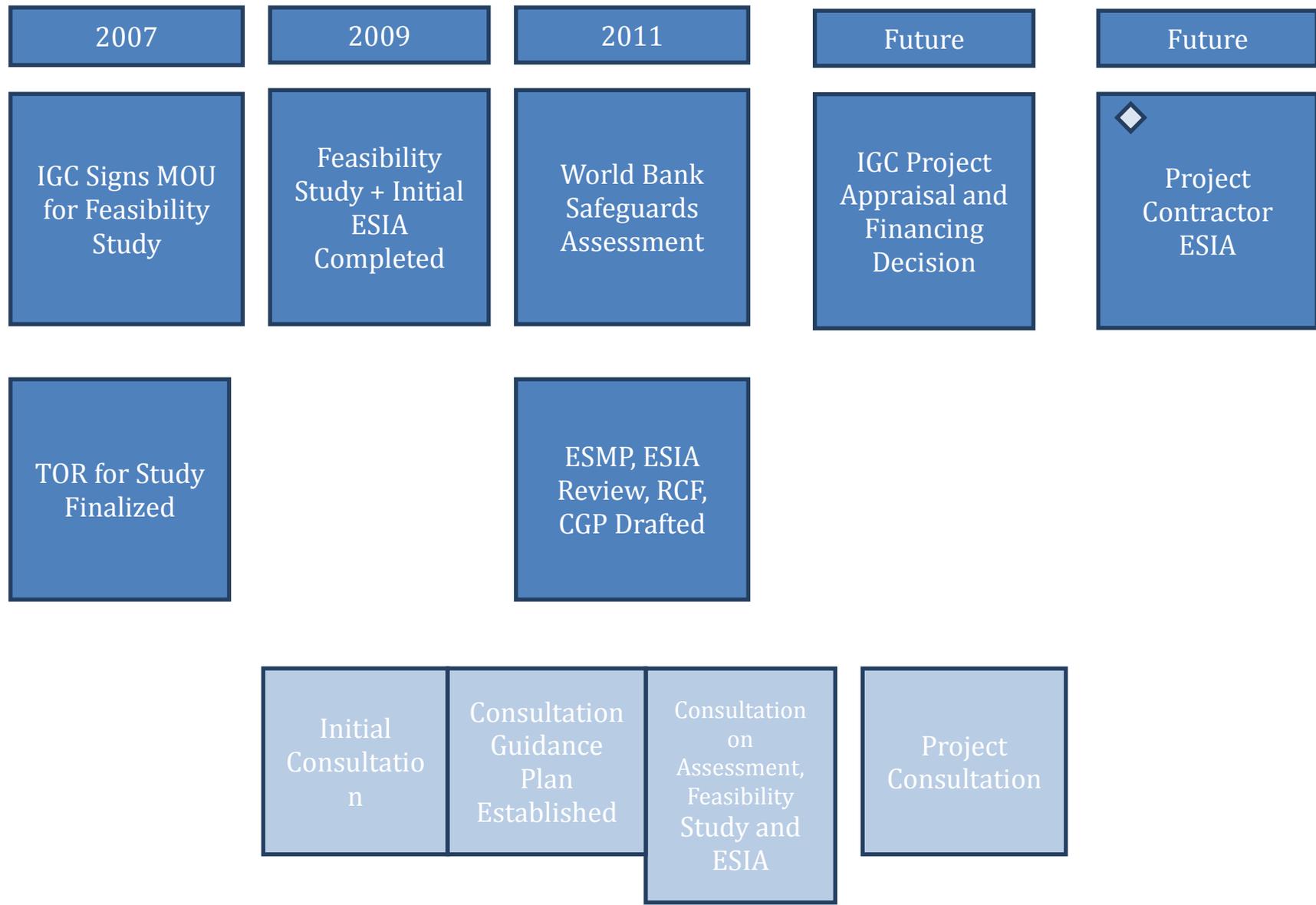
The objective of this Consultation Guidance Plan is to provide direction for the consultation on this ESIA/ESMP and to ensure that potentially affected stakeholders and communities are notified and consulted in an appropriate manner. This CGP functions with the understanding that initial public consultation on the CASA 1000 Project has occurred, and will assist in resolving previous consultation deficiencies, increasing the scale of the inclusion of project affected peoples (PAP) and in Project appraisal moving forward.

In accomplishing these objectives, the CGP will assist the Project in meeting World Bank requirements of its Safeguards Assessment: Operational Policy (OP) and Bank Procedures (BP) for Environmental Assessment (OP and BP 4.01) and Country-specific laws identified through consultation with departments stated in their Appendix 6-3. Both the OP and BP 4.01 require that:

*“the borrower consults project-affected groups and local nongovernmental organizations (NGOs) about the project’s environmental aspects and takes their views into account. The borrower initiates such consultations as early as possible.”*

The CGP is also designed to obtain information that will inform future Project stages (Figure F2-1). As such, the CGP, although specific for this phase of consultation is designed to be adaptable for future project stages.

Figure F2-1: CASA 1000 Project Milestone Overview



## 2.2 CONSULTATION PRINCIPLES

Key principles of successful consultation are the following:

- Open and honest communication – stressing a shared process which is two-way;
- Timely – Provision of Project information with adequate notice of opportunities to participate;
- Respectful and aware of values, culture and potential diversity;
- Accessibility of In-Country Consultation Team (ICT) and Authority/Proponent for PAPs;
- Providing sufficient mechanisms for PAP input; and,
- Coordinated – Efficient use of communication and timely, all inclusive provision of information

## 2.3 BEST PRACTICE CONSIDERATIONS

There are three key practice considerations needed in order to comply with local, World Bank (WB) and best practice consultation standards:

- Inform the all stakeholders of the Project:
  - Explaining the scope and objectives of the consultation program;
  - Share with PAP relevant and timely information on the project and possible impacts of construction and operation on the physical, biological, ecological and social environment;
  - Describe benefits and opportunities of the Project for local peoples and communities;
  - Manage expectations of the stakeholders.
- Provide the stakeholders an opportunity to supply input/feedback about the Project:
  - Obtain information on stakeholders concerns and suggestions with regard to potential impacts of the project;
  - Identifying and addressing public concerns regarding environmental and social issues; and
  - Assisting with addressing ESIA data gaps.
- Involve the public in decision making:
  - Involve public in making decisions based on input and communication with the Authority/Proponent;

- Provide PAP opportunity to influence project in a positive way; and
- Incorporate PAP opinion and feedback into the Project design to avoid or mitigate impact.

The following are considered key statements for the success of consultation for the CASA 1000 Project:

- Consultation should be early so stakeholders can influence each stage of the project cycle;
- Project materials/information should be:
  - Highly visible
  - Delivered early
  - In more than one medium – i.e. pamphlets, radio
  - Conveyed more than once
- Consultation should begin before major project decisions are finalized, so stakeholder input can be incorporated into Project design, if feasible;
- Identify constraints/vulnerable groups – women, political, ethnic prejudices etc.; and
- Promote public involvement in mitigation, management and monitoring measures.

## **2.4 CONSULTATION PLAN ASSUMPTIONS**

The CGP is written with the assumption that the ICT in each of the four CASAREM countries has the appropriate local knowledge, or will work to obtain this knowledge through communication with experienced and knowledgeable local entities (NGOs, Gov't) for appropriate implementation. The CGP, while attempting to meet the aforementioned objectives, acknowledges the need for the ICT to customize and select process methods, due to cultural and geographical challenges specific to each CASAREM country. It is probable that the best method to consult may only become apparent after a study of local cultures and customs.

The objective of this next phase of consultation for the CASA 1000 project is not to perform another social assessment for the region and population. This consultation occurs with the understanding that an 'Initial Environmental & Social Impact Assessment' (IESIA) was performed by SNC, and the information contained within this ESIA/ESMP at the Feasibility Stage. However, socio-economic and environmental impacts may be identified through input from PAP during the consultation and will hence be responded to and can assist in the Project appraisal.

The role of the ICT for the CGP is not to discuss resettlement, land acquisition and compensation, but to ensure the PAPs that these issues are important and will be discussed with them in the future during separate consultations to facilitate project review and appraisal..

### 3. POLICY AND LEGAL FRAMEWORK AND REQUIREMENTS

Apart from providing a CGP that incorporates best practices for consultation, it is critical that the consultation that occurs for the Project conforms and complies with both World Bank Policies and local regulatory requirements in each country.

#### 3.1 WORLD BANK POLICIES

The World Bank does not provide a specific operation policy strictly for public consultation. However, the task of public consultation is included within the Operation Policy (OP) and Bank Procedures (BP) for other WB topics. Those that have been reviewed with potential applications to this Project include:

- OP and BP 4.01 – Environmental Assessment
- OP and BP 4.04 – Natural Habitats
- OP and BP 4.11 – Physical Cultural Resources

The CGP proceeds under the assumption that the Indigenous Peoples Consultation (O.P. 4.10) is not triggered in the four Project-involved countries; Kyrgyz Republic, Tajikistan, Afghanistan and Pakistan.

Consultation related to Involuntary Resettlement (O.P. 4.12) will be managed in the separate Resettlement and Compensation Framework document .

The CGP has included the consultation requirements that are relevant for each country and further detailed WB requirements below:

##### 3.1.1 OP 4.01 – ENVIRONMENTAL ASSESSMENT

The Casa 1000 Project has been classified as Category A, which denotes the following requirements of the Project according to OP 4.01;

*“...it is likely to have significant adverse environmental impacts that are sensitive, diverse, or unprecedented. These impacts may affect an area broader than the sites or facilities subject to physical works.”*

Both the OP and BP 4.01 require:

*“that affected groups and nongovernmental organizations (NGOs) be consulted as part of the environmental assessment of projects and particularly those with potentially significant impacts (Category A). The primary purpose of this provision is to protect the interests of affected communities, especially the poor and vulnerable.”*

OP 4.01 further states that:

*“the borrower consults project-affected groups and local nongovernmental organizations (NGOs) about the project's environmental aspects and takes their views into account. The borrower initiates such consultations as early as possible. For Category A projects, the borrower consults these groups at least twice: (a) shortly after environmental screening and before the terms of reference for the EA are finalized; and (b) once a draft EA report is prepared. In addition, the borrower consults with such groups throughout project implementation as necessary to address EA-related issues that affect them.*

In regards to disclosure of Project information OP 4.01 states the following:

*“... the borrower provides relevant material in a timely manner prior to consultation and in a form and language that are understandable and accessible to the groups being consulted.”*

*“For a Category A project, the borrower provides for the initial consultation a summary of the proposed project's objectives, description, and potential impacts; for consultation after the draft EA report is prepared, the borrower provides a summary of the EA's conclusions. In addition, for a Category A project, the borrower makes the draft EA report available at a public place accessible to project-affected groups and local NGOs. For SILs and FI operations, the borrower/FI ensures that EA reports for Category A subprojects are made available in a public place accessible to affected groups and local NGOs.”*

### **3.1.2 OP 4.04 – NATURAL HABITATS**

*“The Bank expects the borrower to take into account the views, roles, and right of groups, including local NGOs and local communities, affected by Bank-financed projects involving natural habitats, and to involve such people in planning, designing, implementing, monitoring, and evaluating such projects.”*

### **3.1.3 OP 4.11 - PHYSICAL AND CULTURAL RESOURCES**

Consultation & disclosure linked to public consultations for EA process:

*“...[consultation] normally includes relevant project-affected groups, concerned government authorities, and relevant nongovernmental organizations in documenting the presence and significance of physical cultural resources, assessing potential impacts, and exploring avoidance and mitigation options .”*

PCR aspects can be omitted from publicly disclosed EA if Borrower & Bank agree this would jeopardize the safety and integrity of the PCR involved or endanger the source of information.

## **3.2 COUNTRY SPECIFIC LAWS**

### **3.2.1 TAJIKISTAN**

#### **Nature Protection Law**

- An applicable Tajikistan law related to consultation on environmental issues is Article 10 of the Nature Protection Law, which proclaims the right of citizens to live in a favorable environment and to be protected from negative environmental impacts. In doing so citizens have the right to environmental information (Article 12), as well as to participate in developing, adopting, and implementing decisions related to environmental impacts (Article 13). The latter is assured by public discussion of drafts of environmentally important decisions and public ecological reviews. Public representative bodies have an obligation to take into consideration citizens' comments and suggestions. The Law also provides rights to the citizens to conduct a Public Environmental Expertise (hearing) (art. 21). (ISIA-Tajikistan)

In order to do this, public discussions of drafts of environmentally important decisions and public ecological review must occur. Public representative bodies have an obligation to take into consideration citizens' comments and suggestions.

- Requirements of Tajikistan Law largely comply with the WB safeguard policies. Where Tajikistan law is less developed the more stringent WB safeguards will be adopted.

Based on the ESIA/ESMP, no indigenous populations live within the Corridor of Impact (COI) in Tajikistan. Consultation relating to specifically Resettlement and Compensation will be managed in Part E, Section 6: Resettlement and Compensation Framework.

### 3.2.2 PAKISTAN

The Pakistan Environmental Protection Agency produced 'Guidelines for Public Consultation' for conducting environmental assessments and the environmental management of different types of development projects. The objectives of the consultation are in many ways consistent with WB Safeguards and best practice. They are the following:

- Informing the stakeholders about what is proposed;
- Providing an opportunity for those otherwise unrepresented to present their views and values, therefore allowing more sensitive consideration of mitigation measures and trade-offs;
- Providing those involved with planning the proposal with an opportunity to ensure that the benefits of the proposal are maximized and that no major impacts have been overlooked;
- Providing an opportunity for the public to influence project design in a positive manner;
- Obtaining local and traditional knowledge (corrective and creative), before decision making occurs;
- Increasing public confidence in the proponent, reviewers and decision-makers;
- Providing better transparency and accountability in decision making;

- Reducing conflict through the early identification of contentious issues, and working through these to find acceptable solutions;
- Creating a sense of ownership of the proposal in the minds of the stakeholders; and
- Developing proposals which are truly sustainable.

The Guidelines further lay out the following Principles should be sought when performing consultation:

- Sufficient relative information provided and easily understood by non-experts;
- Sufficient time allowed for PAP to read, discuss and consider information and implications;
- Sufficient time allowed for stakeholders to present views;
- Responses made by proponent to issues and problems raised by PAP;
- Selection of venues conducive for maximum attendance and free exchange of views.

Additional guidelines that should be reviewed and may be relevant to the CASA-1000 Project are:

- Guidelines for the Preparation and Review of Environmental Reports, Pakistan
- Sectoral Guidelines: Pakistan Environmental Assessment Procedures, Pakistan.

This CGP proceeds under the assumption that the Indigenous Peoples Consultation (O.P. 4.10) is also not triggered for Pakistan.

### **3.2.3 AFGHANISTAN**

The National Environmental Impact Assessment Policy: An Integrated Approach to Environmental Impact Assessment in Afghanistan provides the guidelines for public participation, which states that:

*“...the process should provide appropriate opportunities to inform and involve the interested and affected publics, and their inputs and concerns should be addressed explicitly in the documentation and decision making”*

*“...the process should have clear, easily understood requirements for EIA content; ensure public access to information; identify the factors that are to be taken into account in decision making; and acknowledge limitations and difficulties.”*

The EIA policy vision of Afghanistan is:

*“The use of EIA shall be implemented by the Government to protect the environment and community well-being in Afghanistan thereby assisting the progress of sustainable development”*

Regarding ‘public disclosure’ the Policy states:

*“Public disclosure will be provided within 7 days from the written notification of the proponent. Public disclosure will include information being made available to the general public at National Environmental Protection Agency’s (NEPA) Kabul and relevant regional offices. The proponent will be responsible for costs associated with public disclosure which will be covered by the application fee lodged with NEPA on license application.”*

The Afghanistan Environment Law states the opportunity for public consultation to occur as part of the EIA process. It further states that:

- Affected persons may express their opinion on the proposed project, plan, policy or activity, the preliminary assessment, the environmental impact statement, the final record of opinion, and the comprehensive mitigation plan, before the approval of the project plan, policy or activity, and the proponent must demonstrate to the National Environmental Protection Agency that affected persons have had meaningful opportunities, through independent consultation and participation in public hearings, to express their opinions on these matters on a timely basis. (Article 19)
- In regard to a proposed project, plan, policy or activity that is likely to have highly significant adverse effects on the environment, affected persons must be allowed the opportunity to participate at each of the phases referred to in sub-article 1 by the National Environmental Protection Agency and relevant institutions.
- The National Environmental Protection Agency shall not reach a decision on any application for a permit until such time that the proponent has demonstrated to the satisfaction of the National Environmental Protection Agency that the proponent has distributed copies of the document to affected persons, informed the public that the document is being made available for public review by advertising the document and displaying a copy of it for inspection, and convened and recorded the proceedings of a public hearing.
- After the National Environmental Protection Agency has reviewed the conditions set forth in sub-article 3, The National Environmental Protection Agency shall reach a decision and inform the public of that decision and make available any relevant documentation or information for public review.

The CGP proceeds under the assumption that the Indigenous Peoples Consultation (O.P. 4.10) is not triggered for Afghanistan because no group is more indigenous than another.



## 4. CONSULTATION GUIDANCE PLAN

The CGP is to act as a guide to assist the ICT in the next phase of consultation and potentially ongoing consultation for the Project.

The CGP, in most cases, does not provide answers to the presented tasks. It is the role of the ICT to gather the appropriate information and then complete the consultation tasks.

### 4.1 CREATE THE IN-COUNTRY CONSULTATION TEAM (ICT)

The success of the consultation and the functionality of this Consultation Guidance Plan (CGP) rely largely on the ICT and their capacity to perform and contribute to the tasks. The ICT is expected to augment information presented in this ESIA/ESMP. In doing so, the ICT will provide complete and compliant consultation for this current phase of consultation. Information collected by the ICT following the use of the CGP will facilitate the decision making process for Project appraisal. Apart from the ethical integrity and safety of the research data, the ICT are responsible for utilizing the CGP as a guideline and performing the CGP tasks in order facilitate the success of the consultation process. The ideal ICT would be comprised of individuals:

- Familiar with the Project;
- Experienced in stakeholder engagement;
- Familiar with the Project area;
  - customs,
  - local languages,
  - tribes, and
  - authority hierarchies.
- That demonstrate respect, understanding, integrity;
- That communicate effectively;
- Familiar with data management; and
- That communicates on technical topics of the Project.

The ICT is expected to incorporate the 'key messages' and communication strategies into all work they perform in meeting the consultation objectives. The ICT will act as a representative for the Authority/Proponent, and may be referred to as the 'Authority/Proponent' in forthcoming sections when the term is applicable.

Ideally, the organizational structure of the ICT would have individuals with the following roles:

- Consultation Manager – one individual that leads the consultation effort, delegates specific consultation work, monitors and evaluates to ensure consultation process is on track and meeting objectives, is the liaison between government, Authority/Proponent, SNC design team, creates budget and schedule,
- Researchers – validation of existing material, secondary research for identification of stakeholders (land cadastral information, stakeholder contact information), management of communication data;
- Field Staff – delivery of notifications, interview of stakeholders, recording of communication, identification of technical issues needing specialized response.
- Expert Consultants – can speak to technical contentious issues in response to stakeholder comment.

#### 4.2 CREATE A BUDGET

The ICT must work with local government and/or WB to determine a budget for this phase of consultation. The development of the budget must incorporate the necessary tasks to complete a successful, compliant consultation process.

#### 4.3 DEVELOP A SCHEDULE

This phase of consultation is expected to be completed by the end of year 2011, in order that the results can be used in conjunction with this ESIA/ESMP, to assist in the Project appraisal process. In order to meet this expectation a preliminary schedule has been developed Table F4-1, which should be reviewed and modified by the ICT to improve feasibility.

**Table F4-1: CASA 1000 Implementation Table**

Task	Responsible Party	Timeline
Create the In-Country Consultation Team	Country Government	1 month
Create a Budget	ICT/WB	1 day
Develop Schedule	ICT/WB	2 days
Validate Existing Material	ICT	3 days
Identify Stakeholders	ICT	2 weeks
Develop Communication Materials	ICT/External Consultant	2 weeks
Create a Grievance Mechanism	ICT	2 days

Task	Responsible Party	Timeline
Determine Capacity Needs	ICT	ICT
Disseminate Project Information and Consultation	ICT	4 to 6 Weeks
Obtain Stakeholder Feedback	ICT	4 to 6 Weeks
Respond To Issues	ICT/Authority/Proponent/SNC/WB	Ongoing
Involve the Public in Decision Making	ICT	Ongoing
Track Communication	ICT	Ongoing
Evaluate Consultation Process	ICT	Ongoing
Monitor Consultation Process	ICT	Ongoing
Present Results	ICT	

#### 4.4 VALIDATE EXISTING MATERIAL

The ICT review of the CGP is essential in order to gauge its feasibility, identify challenge, modify process and assist in preparation of consultation. In addition, the success of the CGP relies largely on the ICT knowledge of this ESIA/ESMP, so that the ICT can prepare consultation materials and speak to the identified issues when called upon. The following items that have been included in this CGP should also be reviewed by the ICT:

- the local laws to ensure the consultation process complies with these laws;
- Review list of stakeholders provided from the SNC ISEIA; and
- the consultation that has already occurred for CASA-1000 and determine which entities need to be re-engaged.

#### 4.5 IDENTIFY STAKEHOLDERS

The ICT must do the preliminary identification of all (relevant) PAP and/or individuals or bodies that represent stakeholders, as well as their interests in the Project. The COI has been identified and mapped and PAP should be identified based on this COI. As the final routing of the T/L has not been selected,, the COI as indicated in the ESIA/ESMP serves as the base for the consultation process going forward with the realization that with additional input, some from consultation, modifications will occur in order to avoid or minimize impact.

In order for stakeholder identification to occur, the following tasks are necessary:

- Use of the ESIA/ESMP alignment sheets

- Use of local knowledge and secondary data research (land cadastral information) to classify interest of land identified through use of ESIA/ESMP alignment sheets:
  - Landowners
  - Residents
  - Regulated Land Users
  - Informal land users (farming, grazing),
  - Informal residents (temporary or permanent structure not legally recognized)
  - Applicable Government Representatives/Departments (refer to Section 6) i.e., National Highway Authority
  - Relative Non-governmental Organizations
  - Community Leaders / Group representatives that speak for larger portions of the population
- Identification through direct contact: face-to-face interviews, walking the transmission line;
- Contact with local government, leadership entities in communities located near the COI. Subsequent mapping of stakeholders and discussion of appropriate method of contact with these individuals;
- Creation of contact mechanisms that facilitate the ability of stakeholders to contact the Authority/Proponent; Project phone number, email, web page, publication and availability of local community representative for direct contact;
- Engaging local NGO's with geographical, cultural, traditional knowledge; and
- Wide-spread publicized open houses for general public.

Existing consultation records can help provide input as to how the consultation could occur going forward. However, all information should be reviewed and potentially utilized with the understanding that significant time has passed and that more thorough consultation is needed. The information in this section is to provide guidance, a potential starting point but is by no means an inclusive or exhaustive list of stakeholders to be consulted, comments or issues that stakeholders have expressed, or process that is to occur.

#### **4.6 DEVELOP COMMUNICATION MATERIALS**

The conveyance of project information in the appropriate manner is essential for the consultation process. These materials can be developed by the ICT if they have the necessary capacity or can be

outsourced to an external consultant with relevant knowledge and capacity. For the development of notification materials, there are a number of important aspects that need to be considered.

- Language – the person receiving printed information needs to understand the language or have translation help or oral explanation of material;
- Vocabulary level – easy to understand for recipients;
- Understandable non-complex diagrams etc;
- Transparent – important information is included, relevant and accurate;
- Relevant material – information includes key aspects of Project including potential impacts, process etc.
- Timely material – information is up-to-date;
- How the material is to be delivered – print, radio, internet, government offices, meetings etc.; and
- Includes contact information for the stakeholder and the Consultant/Project Representative.

Delivery of information in and of itself is not consultation, but does comprise one part of the process. It is important that stakeholders receive and understand Project information so that they can better provide feedback back to the proponent. The initial conveyance of information is described as a project notification. Depending on the demographics of the multiple areas that could be affected by the project, this notification can occur in different ways:

- Printed Materials – newsletters, letters, - distributed by hand, mail or pick-up at community location;
- Email – printed materials converted to digital file and distributed via internet;
- Displays and exhibits – presented at Open Houses or left for viewing at public office;
- Media – newspaper, radio, television; - more useful to inform public of another opportunity to view more detailed Project information (open house, exhibit, or contact proponent); and
- Formal and Informal information sessions – Focused community meetings or open houses, opportunity to speak to Project and answer questions.

The development of materials requires the knowledge of technical aspects of project engineering, the SNC IESIA reports, this ESIA/ESMP, existing expertise, and local knowledge.

#### 4.6.1 INFORMATION TO INCLUDE

The ESIA/ESMP needs to be utilized to prepare the general public consultation materials to be presented, distributed and made accessible to stakeholders. The creation of these materials can be performed by the ICT or an external party with communication experience and access to the appropriate project information. Information for stakeholders needs to include the following:

- Project Description;
  - Need for Transmission lines; and
  - Description of Line:
    - Route;
    - Length;
    - Type; and
    - Location/spacing of towers.
  - Right of Way (ROW) description;
  - Corridor of Impact (COI) description;
  - Potential Timing; and
  - Substations.
- Land access need – what land is needed and what it may be needed for; tower positions, camp locations, temporary storage;
- Land Acquisition and Compensation – the topic of land acquisition and compensation can be broached but it must be clearly stated that these topics will be managed in the future when route selection is closer to finalization. The purpose of this current consultation is for notification of the project and stakeholder feedback regarding potential environmental and social impacts and benefits of the Project;
- Effect on way of living:
  - Benefits – Potential benefits have been included in the ‘ESIA and ESMP of the Central Asia South Asia Electricity Transmission Project (CASA 1000): Feasibility Stage’ document that needs to be explained to stakeholders. Projects tend to proceed with less resistance if stakeholders benefit from the Project, and the stakeholders understand these benefits. Benefits from the CASA-1000 Project (depending on country) could include; increased and/or more stable electrification for communities, employment, goods and services support to workers.

- Impacts - Potential social and environmental impacts have been summarized in 'ESIA and ESMP of the Central Asia South Asia Electricity Transmission Project (CASA 1000): Feasibility Stage' document and these should be provided in the notification materials. Impacts include those to:
  - Physical Environment;
  - Biological;
  - Socio-Economic;
  - Camps, worker presence and potential for community disruption; and
  - Transmission Hazards.
- Purpose of presenting the project to Stakeholders;
  - in order to gain local knowledge;
  - incorporate stakeholder input into the project design; and
  - Avoid, mitigate impacts.
- Employment and Business Opportunities – what opportunities may exist for the public and how to contact the Project representative in regards to becoming involved in the Project;
- Commitment to work with stakeholders;
- Commitment to Transparency; and
- How to Contact Project Authority/Proponent/Representative.

The above information needs to be confirmed with the design and project team so as to ensure it is accurate and up to date up to the point of material creation.

#### **4.7 CREATE A GRIEVANCE MECHANISM**

The determination of an appropriate manner to deal with stakeholder grievances rests largely with the ICT as they take into account customs and culture. Information that needs to be tracked includes: type of grievance, response guidelines/process, mitigation or resolution, alternative dispute resolution, and outstanding grievances.

The ICT must create a grievance mechanism process that will provide stakeholders a method to contact a Project representative (likely a member of ICT) in order to provide comment and present issues. This process may differ between stakeholders and geographical locations. This mechanism could be in the form of an:

- Email address;
- Phone number;
- Complaint box;
- Report to a community representative with whom the Project Representative keeps in close contact; and
- Face-to-face with Project representative who makes themselves available at known times, at various locations throughout the Project life-cycle.

In addition, this mechanism needs to be easily transferrable to the next round of consultants, whether these are from the WB, the Project Proponents, or the Engineering Team.

#### **4.8 DETERMINE CAPACITY NEEDS**

The ICT (representative of the proponent) in conjunction with the stakeholders should evaluate the capacity needs of the stakeholders in order to effectively fulfill the roles and responsibilities. It is the Project Authority/Proponent's goal to make these negotiations and consultations as equitable and fair as possible, meaning capacity building for stakeholders may be necessary for some of the roles. This capacity building to ensure that stakeholders understand and can provide input to the Project is the responsibility of the Project Authority/Proponent and may be identified by the ICT. It may be feasible and recommended that a third party non-governmental organization work alongside the stakeholders providing expertise throughout the negotiation and consultation period.

#### **4.9 DISSEMINATE PROJECT INFORMATION AND CONSULTATION**

The ICT will have determined the best manner to distribute information to the already identified stakeholders. This provision of information may differ between countries and even between regions within countries. The ICT should be well-prepared by this point through the participation in the preceding activities.

It is suggested that Project information be presented to stakeholders in at least two mediums. It is likely that these two mediums will be through printed materials, and then through face-to-face or oral presentation.

The Project materials should be provided by the ICT with the intention that stakeholders have the opportunity to review the information and meet and discuss the material with the Authority/Proponent in the near future. A strong example of this would be the provision of a Project brochure by hand or mail by the Authority/Proponent that contains the date of an Open House that is to occur in the community in two weeks. This allows the stakeholders to review materials, speak to others, and formulate questions and comments that they can present back to the Authority/Proponent. At the open house the ICT can then re-present the Project material, inquire about understanding of the Project and answer any

questions. The ICT should have access to this ESIA/ESMP if it needs to be referred to. It is also advisable that the ICT team discuss with local government representatives to determine if a full copy of this report can be left at various local, accessible locations for review.

It is important that there is consistency between the materials provided early with the information that is presented at future public gatherings. If there have been any updates, the Authority/Proponent should acknowledge these and present them to the stakeholders.

Throughout the consultation process it may be determined that the adaptation of materials may be necessary. Apart from content, it may be discovered that the form in which the message is communicated may need to be modified. ICT must be prepared to identify challenges with the consultation method and adapt the process accordingly. One such challenge identified by the SNC IESIA reports is that literacy amongst the potential stakeholders varies significantly.

Due to the length of the potential transmission line and the number of stakeholders the ICT should allow for plenty of time for this task to ensure this communication is initiated and completed successfully for this phase of the Project.

#### **4.10 OBTAIN STAKEHOLDER FEEDBACK**

The information received by the Authority/Proponent from the stakeholders is a key component of the consultation process. This feedback from stakeholders provides information that should facilitate the potential of your Project being completed. Feedback from stakeholders could include or lead to:

- Previously unidentified land use on route;
- Potential impact to individuals and their land use;
- Previously unidentified impacts or concerns about the Project;
- Possible alternative routes with less physical/social resistance;
- Traditional and historical sites;
- Re-strengthening of the stakeholders belief and perception that they are being involved in the process; and
- Avoidance and mitigation measures for negative impacts.

The aforementioned notification and informing process is critical to this stage in the consultation process. The better informed the stakeholders are, the more valuable their feedback to the Authority/Proponent becomes. The manner in which the feedback is obtained depends on the Authority/Proponent. Some tools that are commonly used with stakeholders to facilitate the feedback process include:

- One-on-one, or one-on-household meetings;

- Surveys provided with information materials or distributed at formal and informal meetings;
- Open talk sessions at large open houses;
- Small group sessions (focus groups) with coordinated responses to Project; and
- Communities/group representatives or advocates speak on behalf of potentially impacted entities.

The most essential aspect of stakeholder feedback is that they have accessibility to the Project Authority or Authority/Proponent<sup>83</sup>. If there is an issue that needs to be communicated back to the Authority/Proponent, there must be an easy way to get this message through. The Authority/Proponent must provide every opportunity for this reception of stakeholder input to exist. In addition to the aforementioned tools, measures to be used can include:

- Provision of contact information to stakeholders where they can call, email direct to Proponent;
- Designation of a community individual (by Authority/Proponent or community members) that receives stakeholder feedback and can forward this information on to Authority/Proponent, or meets on a regular basis (e.g.. Weekly) and can pass input along at this time; and
- Authority/Proponent publicizes regular visits to communities where he provides opportunities to stakeholders to present feedback.

#### **4.11 RESPOND TO ISSUES**

The ICT must respond to input from PAP in a prompt and relevant matter in order to demonstrate the Authority/Proponent's concern with the matters. Suggested strategies to perform such response might include:

- A set time objective for a response guarantee to any stakeholder concern or comment (1 day, 3 days, 7 days). This time objective can vary depending on medium of the feedback (phone, email, written).
- If an immediate appropriate answer is not feasible inform the stakeholder that one is forthcoming;
- If the response is to an issue that is of concern to many individuals in one particular area the Response/explanation can be given at a community meeting.

For each issue the final response must include communication from the PAP that the issue has been resolved or needs further ICT input. Any further response needed would categorize the issue as 'outstanding'.

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<sup>83</sup> It is suggested that the Project Management Unit (PMU) represent the Proponent in each country

Tracking of each issue and the corresponding communication is crucial. This information should be tracked using the information tracking sheet (Appendix A is a sample) and the digital stakeholder database (Appendix B is a sample) and include the following:

- Which issues have been dealt with;
- What mitigation measures, or compensation was utilized;
- How was the resolution of the issue incorporated into the Project design;
- Does the PAP feel that the issue was resolved;
- Outstanding issues that need Project Representative input;
- Schedule and method of next input; and
- Are there any issues that are not resolvable.

#### **4.11.1 UNRESOLVED ISSUES**

Stakeholder issues that have not been resolved need to be tracked and alternative resolutions need to be examined. In cases where the ICT and Authority/Proponent cannot come up with a satisfactory resolution in the eyes of the stakeholder, an external third party mediator/facilitator may be needed. Although it is in the Authority/Proponent's best interest to resolve all issues, there will undoubtedly be issues that a fair and equitable solution in the eyes of both parties is not possible. In these cases the issue and communication must be tracked and a resolution may be placed in the hands of a regulatory body or an independent third party.

- Arbitration (impartial mediator)
- Problem-solving (Brainstorming)
- Consensus building (unassisted negotiations mediation)

It is the duty of the ICT to provide a resolution from internal knowledge, discussions with the Authority/Proponent, or design team experts and supply this response back to the stakeholder. If an adequate response is not feasible within a timely fashion (a couple of days), then the ICT must present this back to the stakeholder that a response is forthcoming. The ICT must note all unresolved issues and that further action is still required. During this phase of consultation, predominantly information dissemination and information gathering, there may not be many issues to resolve, rather information will be considered by the Authority/Proponent in the design and routing if the Project goes forward.

#### **4.12 INVOLVE THE PUBLIC IN DECISION MAKING**

Depending on the stage of consultation, there are challenges in which the ICT can involve the public in decision making. At this stage of consultation the ICT's principal actions that they can perform with the feedback obtained from stakeholders is:

- Proper chronicling of the issue;
- Response to stakeholder that the issue has been received and, if resolvable, a resolution will be presented back to the stakeholder; and
- Distribute the issues to the Project design team for consideration and response.

Although a response to all issues presented are necessary, at this stage there are limitations to the ICT and what they can provide back to the stakeholders. If representatives of the design team are able to participate with the ICT in stakeholder consultation opportunities, than resolutions and responses could be presented in a more timely fashion. Measures that can be used, pending Authority/Proponent's presence, to involve stakeholders in the decision making process could include:

- Advisory groups – These entities should be comprised of members of the Authority/Proponent (including experts) and the public. Advisory groups are useful when dealing with one topic; access to potable water, or crop disturbance, or bird protection. When an issue is put forth that falls under a specific topic then it can be discussed within the appropriate advisory group. A number of distinct advisory groups may be necessary for the Project.

#### **4.13 TRACK COMMUNICATION**

With all communication the ICT will be tasked with completing the Communication Tracking Sheet (CTS) (Appendix 1) and ensuring that the information is eventually entered into a digital format. The CTS may be required during communication that occurs during Open Houses when individuals or groups are looking for a response from the Project representatives.

The creation of a simple, useable in-field tracking document to record any correspondence with an individual is critical. This information can be recorded on paper or computer at the time of correspondence but should be transferred to a digital database (Excel, or similar stakeholder tracking system) for easy accessibility, and the facilitation of the transfer of information to other Project and World Bank consultants. The CTS should record:

- Name (if the stakeholder wants to leave this);
- Date of Consultation;
- Location (District, region, township, village, address) – as much detail that is available or stakeholder is willing to provide;
- Method of contact – currently and future (in-person, phone etc.);

- Recording of Issue;
- Recording of Consultant feedback to stakeholder and confirmation of completion of correspondence or necessity for additional correspondence; and
- Name of consultant recording information.

#### **4.13.1 POST CONSULTATION INFORMATION TRACKING**

Consultation information gathered throughout the day should be transferred from hard copy (paper) to digital format on a tracking data base on computer. This information needs to be organized so that it is easily understandable and easily combined with other information and easily transferrable to other consultants working on the project. Appendix 2 displays a simple database system on Excel that can be easily transferred and imported into other programs.

#### **4.14 EVALUATE CONSULTATION PROCESS**

The success and effectiveness of a public consultation process should be evaluated in order to improve on methodology going forward and ensuring the Authority/Proponent is doing the activities needed. Proper evaluation will help in learning from past experience, improve service delivery and to take the Project Authority/Proponent/ICT to task demonstrating results are necessary for accountability to stakeholders.

The evaluation should take a look at the original objectives of the consultation, and assess if and how those objectives were met.

There are various methods in performing evaluations which could include:

- Performance Indicators;
- Formal Surveys; and
- Impact Evaluation.

At this stage in the consultation, preliminary evaluation is more likely, as the Project is still in the design phase.

Evaluation for the ICT and this next stage of consultation could include the creation of basic targets and a review of those targets and the CGP objectives at the outset of this consultation. Basic questions could include:

- Were activities performed?
- How many stakeholders were identified?
- How many stakeholders were contacted?
- Was a continual consultation and Authority/Proponent accessibility process formed?

- How many concerns were presented to ICT?
- How many concerns were responded to?
- How many concerns are outstanding?
- Were objectives met on budget?
- Has the consultation exercise positively influenced the design and implementation of the overall project?

#### **4.15 MONITOR CONSULTATION PROCESS**

Monitoring can take place internally by the Authority/Proponent but should also include a non-partisan third party. A local or international NGO would most likely be able to perform this task. Internally, at this stage the ICT can set up a simplistic monitoring system should be set-up for the entirety of the Project, however the monitoring that relates to this phase of the consultation should include an assessment if the following has or is occurring:

- Stakeholders are being contacted;
- Stakeholder concerns are being responded to;
- Has infrastructure or process been developed that allow stakeholders continue to have access to the Authority/Proponent after the Authority/Proponent has presented information and has left the stakeholder/community;
- Stakeholder concerns are being considered and/or incorporated into the Project design;

#### **4.16 PRESENT RESULTS**

The ICT through proper recording of efforts and tracking of communication will present results in written and digital format back to WB, which in turn will be utilized in conjunction with this ESIA/ESMP. Key aspects to be included in this report include:

- Results of Stakeholder Consultation;
  - Contact List of who was consulted
  - Outstanding consultation
- Chronicling of Stakeholder Concerns and Issues;
- Responses provided to Stakeholders;
- Challenges and limitations of process.

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## PART G: ENVIRONMENTAL AND SOCIAL ALIGNMENT SHEETS

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## 1. INTRODUCTION

Transmission lines require specific spatial data, analysis and map layout techniques over large linear distances. Their specific characteristics make them quite different from the distribution utility, natural resources and public GIS applications. While polygon overlays have their use, stationing and linear event processing are much more important. Transmission lines and other industries such as pipelines, communications and railways also require linear map products. The specific linear mapping needs will be addressed through this document referred to as Environmental and Social Alignment Sheets (ESASs).

The ESASs are a geographical reference and inspection tool used to organize and provide visualization of conditions along a linear corridor. In the case of CASA 1000 transmission line project, satellite imagery was overlaid with the two T/L routes along with an appropriate database of referential information in order to perform analysis of the conditions along those routes in a geographically referenced manner.

ESASs and imagery provide critical information for the CASA 1000 T/L route. ESASs store multiple layers of data in a single hard copy document. A series of ESASs were created for the entire CASA 1000 RoW, each holding a portion of route's length (approximately 11 km per sheet). A total of 105 sheets were generated to span across the four countries. The breakdown of the number of alignment sheets per each country is discussed as follows:

Kyrgyz Republic – 43

Tajikistan – 11

Afghanistan – 46

Pakistan - 5

For a complete Alignment Sheet description refer to Appendix 3.

The tool used to generate the ESASs is a Geographical Information System (GIS) based application, ArcGIS 10. In addition to standard mapping functions, it provides proximity and overlay analysis. The new features available in ArcGIS 10 enabled processing the data in a timely manner.



## **2. ENVIRONMENTAL AND SOCIAL MAPPING AND ALIGNMENT SHEETS**

### **2.1 IMAGERY**

The quality of the existing imagery and photographs were assessed in terms of usefulness, suitability, accuracy, scale, extent and other factors. During the inception report, the existing imagery was considered inadequate for the Environmental and Social Impact Assessment (ESIA)/Environmental and Social Management Plan (ESMP), mapping, alignment sheet preparation and routing purpose.

As a result, a new set of imagery with a resolution of 6 m was purchased to address these concerns. The imagery was purchased from Rapid Eye AG, Germany dated 2010-2011 and served to update existing information produced by SNC. The new imagery was used to create the ESAs and provides a very useful tool for the construction contractor to produce the final ESIA/ESMP at the time of final route selection. At 6 m resolution, the imagery is current and is very useful for environmental and social planning purposes. The data was also analyzed in conjunction with other public domain image sources such as Google Earth, Birdlife International and Wikimedia. The purchase of new imagery at 6 m resolution was a cost effective process compared to imagery of a 1 m resolution, which is about 10 times or more the cost and not necessary at this feasibility stage of assessment.

The purchase of new imagery has allowed an update and verification of text-based information presented in the ESIA report. Specifically, the new imagery has assisted in the following:

- Production of ESAs and the ESMP;
- Acquiring most recent data;
- Geo-referencing new and existing data;
- Verifying non geo-referenced information collected during the walk-through process; and
- Consistent evaluation procedure for environmental planning and mapping for the entire route.

The ESAs contain the following aspects:

- Angle points, lat/long locations and the transmission line corridor;
- Description of key concerns (linked to the orthophoto and kilometer post);
- Image of the proposed transmission corridor and chainage; and
- Geopolitical information like rivers, roads and railways.

Data to support the development of the ESAs was assembled for seven different categories, this line information had start and stop coordinates for each attribute throughout the length of the transmission line route:

- Land ownership and land use;
- Slope;
- Soils information;
- Environmental concerns;
- Environmental sensitivity;
- Socio-cultural concerns; and
- Watercourses, roads, railways, towns and villages.

## **2.2 SCALE INFORMATION**

The scale on the final ESASs is set at 1:40,000. This is based on the suitability of imagery and photography purchased. The scale of the ESASs was decided based on the following:

- New imagery and photography;
- Available map data;
- Type of feature;
- Available information regarding the feature; and
- Size of the sheet (physical limits for text placement e.g. 11x17)

## **2.3 MAP DATA**

The supplied map data is in ESRI shapefile format associated with shape index and attribute tables. In addition, database (.DBF format) files have been supplied for the route Angle points. The supplied ESRI map datasets consist of the following:

- International Boundaries
- Internal Administrative boundaries
- Settlements
- Angle points along proposed routes
- Polylines delineating proposed route

The shapefiles are topologically structured with the inclusion of attribute tables. Attribution is limited to individual point, geographic coordinates and local area and settlement names.

### 3. METHODOLOGY

Using the new satellite imagery, the ESASs were prepared by identifying project features, concerns and environmental sensitivity. The production of the alignment sheets was based on existing and new satellite imagery and photography. No field visits were undertaken, but additional field investigations by host governments at a later date may be recommended.<sup>84</sup>

Five major considerations were taken into account with this analysis:

- Avian migration routes;
- Land use;
- Cultural and religious sites;
- Impacts on community and
- Physical topography

A corridor of impact (COI) for the Kyrgyzstan-Tajikistan interconnection of 2000 m and for the Tajikistan-Afghanistan-Pakistan interconnection of 500m was used to delineate the COI.

The following section defines the route in a detailed manner organized by each ESAS breaking down the overall environmental impact assessments into clearly defined segments for a more detailed and usable picture of the issues including environmental impacts and possible mitigation opportunities. The projects location and the variety of restrictions in accessing the route direct us to use remotely sensed data to provide the best framework for geographically describing the environmental concerns.

These ESASs and the related data used to support them also provide relevant and contextual information that will enable further investigation including such things as:

- Provision of background and supporting analysis for the route selection phase.
- Stakeholder engagement maps for public consultation and data collection exercises
- Preliminary infrastructure siting exercises

#### VISUAL REPRESENTATION OF ESAS

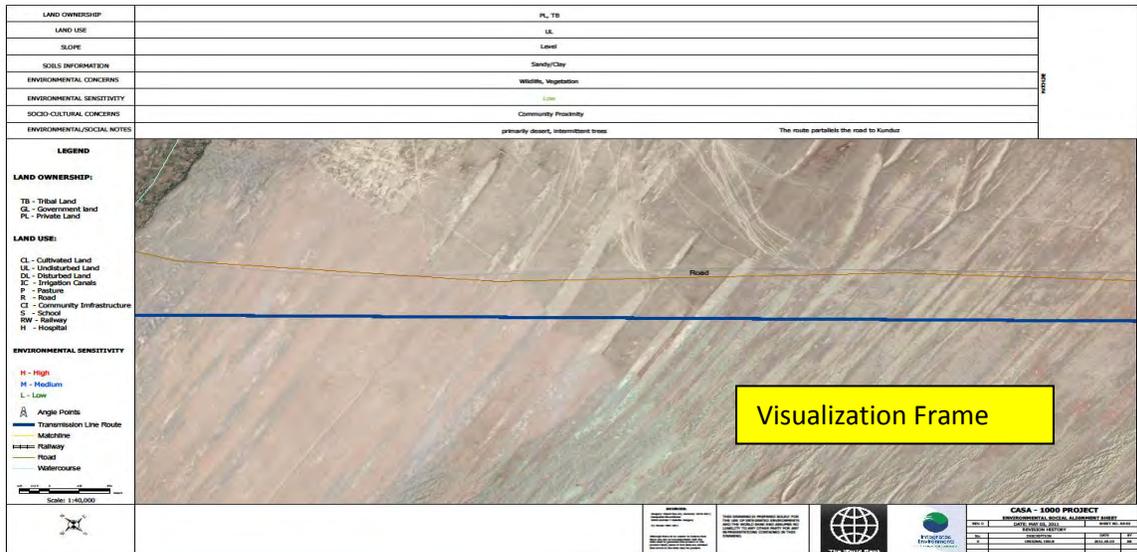
The route was overlaid over the satellite imagery in a geographic information system and image interpretation techniques were used to extract the relevant visible features within the COI. This process was coupled with the geographical referencing of other relevant data sources in order to create the baseline data for the ESAS. The ESAS consist of a legend, Visualisation frame and Data Bands for each segment of the route.

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<sup>84</sup> Significant parts of the corridor are not be accessible due to access, inclement weather, security and safety concerns.

Data Bands

Legend



### 3.1 DATA COLLECTION

The information supplied from The World Bank and SNC consisted mainly of Initial Social Impact Assessments (IESIAs), Initial Environmental Impact Assessments (IEIAs) and Technical Economic Feasibility Studies produced by SNC Lavalin. Only Afghanistan had specific information for the proposed route in which the entire 562 km section of the right of way (ROW) was walked and information was recorded in Word files for each Angle Point.

The supplied information for Afghanistan is presented in the following formats:

- Microsoft Word file (Data Reports) describe of the section of the route providing a variety of social and environmental information, but no specific geo-referenced data. Without geo-referenced coordinates, it was not possible to actually place the information onto the imagery or map data.

  - The Word files assisted to verify the information with Google Earth and the new imagery to generate the ESASs. There does not appear to be any chainage data.<sup>85</sup>
- Powerpoint diagrams – shows the route and specific data points in the form of a diagram but is not geo-referenced – e.g. Point A15 but no coordinates are provided.
- A series of strip maps in JPEG format – where the route has been placed and there is reference to the site e.g. A15. These are only available as “picture” files and therefore have no mapping value.

<sup>85</sup> Chainage is a km reference from a given start point – e.g. 2+100 is 2.1 km from the start point.

The Afghanistan IEIA and ISIA reports include some information referenced by chainage as follows:

- Land ownership
- Affected buildings and structures
- Public infrastructure
- Trees

Data was collected from the following sources:

- SNC reports (ISIA, IEIA, Technical Economic Feasibility Study)
- New Imagery (6 m resolution)
- Satellite Imagery (Google Earth -1 m resolution)
- Birdlife International
- Wikimapia

Data was assembled for seven different categories with subsequent attributes. The line information had start and stop coordinates for each attribute throughout the length of the transmission line route. The coordinate system used to spatially reference the attributes is WSG84. The seven categories with subsequent attributes are listed below:

- Land Owners
  - Government Land
  - Private Land
  - Tribal Land
- Land Use
  - Community Infrastructure
  - Cultivated Land
  - Un-cultivated Land
  - Pasture
  - Irrigation Canal
  - Road
  - Railway
- Slope
  - Level

- Moderate
- Steep
- Soils
  - Loam
  - Sand
  - Clay
  - Organic
  - Alluvial
  - Rocky
- Environmental Concerns
  - Watercourse
  - Vegetation
  - Wildlife
  - Community Infrastructure
  - Forest Ecosystem
- Environmental Sensitivity
  - Low
  - Medium
  - High
- Socio-cultural Concerns
  - Community Proximity
  - Religious Site
  - Cultural Site
  - Military/Conflict Zone

Notes for these categories were also incorporated into the alignment sheets for more detailed information.

### **3.1.1 OUTCOMES**

The ESASs depict the proposed transmission line route and tower locations. The ESASs will assist the engineering consultant, the environmental and social assessment consultant and the construction contractor to:

- Interpret the existing features and verify important features in surrounding area;
- Identify physical restrictions and general conditions expected along the route;

- Determine land use and vegetation cover;
- Determine general soils and slope information;
- Verify project intersections (roads, railways, and watercourses);
- Identify areas of environmental and socio-cultural importance;
- Determine vegetation and wildlife habitat;
- Update information on an ongoing basis, and
- Other relevant information.



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## PART H: REFERENCES

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## CASA 1000: FEASIBILITY STAGE - APPENDICES

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## APPENDIX 1: LARF

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**APPENDIX 1 - BASELINE AND ONGOING MONITORING SURVEY**

In order to thoroughly assess the social impacts of this transmission line project, we need information about your homestead. This information will be treated as confidential but it is required to ensure that we have proper record of your homestead assets and the land that you make use of. Please assist us by providing the information to the best of your ability.

Interviewer name			
Household Number (unique)			
GPS Location (UTM) Homestead	E		N
Village Name (if applicable)			
Area			
Date: Interview	mm/dd/yyyy		
Date: Data Input	mm/dd/yyyy		
Checked by Supervisor			

Q 1 Name of the household head

---

Q 1.1 Name of the person who was interviewed \_\_\_\_\_

Q 2 Please tell us about the members whom make up your household.

No.	NAME	RELATION HH	SEX	AGE	RESIDENCE STATUS	EDUCATION	OCCUPATION	CASH WAGE EARNER - TICK IF YES
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
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15								
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17								
18								

Total No in Household: \_\_\_\_\_

Q 3 Description of Main Homestead Structures.

						DESCRIPTION OF CONSTRUCTION MATERIALS		
	<b>Main Purpose of Building:</b> 1 = Multifunctional Residential 2 = Sleeping only 3 = Kitchen only 4 = Toilet, Shower 5 = Combined Residential Business (specify business) 6 = Business Only (specify) 7 = Spiritual or House used for ceremonial purposes 8 = Other (Specify)	Round - Shape?  1 = Yes 2 = No	No. of Rooms	Length	Width	Floor  1 = Mud, Earth 2 = Concrete 3 = Other (specify)	Walls  1 = Mud 2 = Concrete Blocks 3 = Clay Bricks 4 = Other (specify)	Roof  1 = Thatch 2 = Zinc 3 = Tiles 4 = No roof 5 = Other (specify)
CODES								
CODES								
CODES								
CODES								
CODES								
CODES								
CODES								
CODES								
CODES								
CODES								
CODES								
	TOTAL							

Q 4 Other Homestead Structures/Fixed Assets on the site (including graves and GPS for these graves)

		MAIN CONSTRUCTION MATERIAL			IF GRAVE, GPS EAST	IF GRAVE, GPS NORTH
<b>Purpose</b>	<b>No. of Structures</b>	<b>1 = Stone and Mud</b> <b>2 = Sticks (Wicker)</b> <b>3 = Wire Fence and Posts</b> <b>4 = Concrete Blocks</b> <b>5 = Wood</b> <b>6 = Other (specify)</b>				
		<b>1</b>	<b>2</b>	<b>3</b>		
<b>Livestock</b>						
<b>Agricultural Storage</b>						
<b>Water Outlet</b>						
<b>Graves</b>						
<b>Other (specify)</b>						

Q 5 Where did you get water from today for use in your house? - tick only one.

1	Rain Water Tank	
2	Well	
3	Communal pump or tap - not on your property	
4	Piped water from the Municipality - on your property	
5	Stream or River	
6	Bought water	
7	Other (specify)	

Q 6 Did any members of your household suffer from the following disease or illnesses in the past six months?  
If yes, please tell us how many of the household members were affected by each?

DISEASE OR ILLNESS	NUMBER OF HOUSEHOLD MEMBERS AFFECTED
TB	
Malaria	
Skin Rash	
Diarrhea	

Q 7 Of the women in this household how many gave birth last year? Are all these children still alive today?

NOTE TO FIELDWORKER: APPROACH THIS QUESTION WITH SENSITIVITY. Last year means the last 12 months.

MOTHER'S NAME	MOTHER'S AGE	NO. OF CHILDREN BORN TO THIS MOTHER IN LAST YEAR	NO. OF BABIES WHOM DID NOT SURVIVE IN THE LAST YEAR

Q 8.1 How many members of the household died last year? Last year means the last 12 months.

Number \_\_\_\_\_

Q 8.2 If there was a death in the household, please ask whether the cause of death is known.

DECEASED PERSON	IS THE CAUSE OF DEATH KNOWN?	CAUSE

Q 9.1 Does your homestead currently have access to arable land that you use, or have used, for cultivation?

Yes	No
Go to Q 9.2	Go to Q 10

Q 9.2 Please tell us about your cultivatable land being used.

No.	WHEN DID YOU FIRST PLANT/USE THIS LAND (DATE)?	WAS IT CULTIVATED IN THE LAST 12 MONTHS? YES OR NO	IF YES - WAS IT HARVESTED? YES OR NO	WAS PRODUCE USED TO FEED THE FAMILY? YES OR NO	WAS PRODUCE SOLD? YES OR NO	MAIN CROP TYPE?	SECONDARY CROP TYPE?	TERTIARY CROP TYPE?
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

Q 9.3 GPS details of each piece of land being used as cultivatable (following from above)

No.	DETAILS
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	

Q 9.4 Are any of these pieces of cultivatable land held with a formal title deed?

YES	NO
Go to 9.4	Go to 9.5

Q 9.5 Did you sell agricultural products in the last year/12 months?

YES	NO
Go to 9.6	Go to Q 10

Q 9.7 If yes, estimate income from sales.

AGRICULTURAL PRODUCT	VALUE
TOTAL	

Q 10.1 Do you have any trees?

YES	NO
Go to Q 10.2	Go to Q 11

Q 10.2 Did you sell any fruit that you harvested from your own trees?

YES	NO
-----	----

Q 11.1 Did any of members of your household go to bed hungry last night?

YES	NO
-----	----

Q 11.2 Was there a shortage of food in the household at any time last year?

YES	NO
Go to Q 10.2	Go to Q 11

Q 11.3 Could you tell us which of the following months were periods in which the household went hungry?

MONTH	HOUSEHOLD WAS HUNGRY
January	
February	
March	
April	
May	
June	
July	
August	
September	
October	
November	
December	

Q 12 How many of the following livestock does the homestead have?

TYPE	No.
Cattle	
Goats	
Donkeys	
Sheep	
Pigs	
Rabbits	
Chickens	
Other Poultry	
Other (specify)	

Q 13 Please tell me how much money, if any, was received by your homestead from each of the following sources in December of last year? We are only interested in cash income available to the homestead. (Interviewer please emphasize that the information will be kept confidential and is required to measure whether people are better or worse off after the projects is in place.)

Migrant remittances (working outside of home area)		AMOUNT
Employment	Gross profits from Self-Employment	
	Salaries, wages of resident household members	
Agricultural (Excluding Compensation)	Livestock sales	
	Crop, vegetables, fruit, etc.	
	Animal product sales	
	Other	
TOTAL CASH INCOME FOR THE LAST MONTH:		

Q 14 If the homestead has children that attend school, where do they go to school? (nearest primary school)

Village/Town \_\_\_\_\_ District \_\_\_\_\_

Q 15.1 Of the children currently in junior school or who will shortly be going to junior school will you send them to high school?

YES	NO
Go to Q 16	Go to Q 15.2

Q 15.2 Why not? Tick main reason (one only)

Not applicable. No children of school going age.	
High school is too far for children to travel.	
High school is too expensive.	
Children are needed to work for the homestead.	
Only have girls and they are not necessary to educate.	
Other: specify:	

Q 16 Do you have any of the following available in your household in a working condition?

ITEM		
Motor Car	YES	NO
Bicycle	YES	NO
Television	YES	NO
Radio	YES	NO
Fridge	YES	NO
Iron Cooking Pots and Pans	YES	NO
Iron Kettle	YES	NO
Cell Phone	YES	NO
Bed with Mattress	YES	NO
Motor Cycle	YES	NO
Plastic Chairs	YES	NO
Gas/Paraffin Cooker	YES	NO
Tractor	YES	NO
Plough	YES	NO
Generator	YES	NO
Other (specify)	YES	NO



**Health Impact Baseline and Ongoing Monitoring Assessment**

<p>This line is the number of people who has been complaining of illness.</p>	<p>Please tell me if during the last 4 weeks, if any of the household members have had any of the following complaints?                  1 = Fever/Feverish                  2 = Cough/Breathing Difficulty                  3 = Diarrhea                  4 = Bloody Urine                  5 = Skin Problem/Itch/Scab                  6 = Injury/Accident                  7 = Eye Infection                  Z = Other                  X = Don't Know</p>	<p>What was the first step taken?                  1 = Gave plenty of food/water                  2 = Sought help from traditional healer                  3 = Home/Herbal Remedy                  4 = Took to Medical Care Facility                  5 = Drug store/Chemical/Pharmacy                  6 = Church/Priest/Spiritual                  X = Don't Know</p>	<p>Did you take this person to the medical facility?</p>		<p>If you did not take this person to a medical facility, what were the reasons?                  1 = No clinic available                  2 = Location to clinic too far and no transport                  3 = There was no medical personnel                  4 = Too expensive                  5 = Medical Treatment for this sickness was not necessary                  Z = Other                  X = Don't Know</p>	<p>If treatment was given at home, what was the kind of treatment given?                  1 = Western Medical Treatment                  2 = Traditional Treatment                  3 = Home Remedy                  4 = Praying with a Priest/Spiritual Healer                  5 = Nothing                  Z = Other</p>	<p>Who decided what to do for the ill person?                  1 = Father                  2 = Mother                  3 = Mother in Law                  4 = Chief of Village                  Z = Other                  X = Don't know</p>
Line	Complaint	First Step	Yes	No	Reasons	Treatment	Decision
	1 2 3 4 5 6 7 Z X	1 2 3 4 5 6 7 Z X	1	2	1 2 3 4 5 6 7 Z X	1 2 3 4 5 6 7 X	1 2 3 4 5 6 7 Z X
	1 2 3 4 5 6 7 Z X	1 2 3 4 5 6 7 Z X	1	2	1 2 3 4 5 6 7 Z X	1 2 3 4 5 6 7 X	1 2 3 4 5 6 7 Z X
	1 2 3 4 5 6 7 Z X	1 2 3 4 5 6 7 Z X	1	2	1 2 3 4 5 6 7 Z X	1 2 3 4 5 6 7 X	1 2 3 4 5 6 7 Z X
	1 2 3 4 5 6 7 Z X	1 2 3 4 5 6 7 Z X	1	2	1 2 3 4 5 6 7 Z X	1 2 3 4 5 6 7 X	1 2 3 4 5 6 7 Z X
	1 2 3 4 5 6 7 Z X	1 2 3 4 5 6 7 Z X	1	2	1 2 3 4 5 6 7 Z X	1 2 3 4 5 6 7 X	1 2 3 4 5 6 7 Z X
	1 2 3 4 5 6 7 Z X	1 2 3 4 5 6 7 Z X	1	2	1 2 3 4 5 6 7 Z X	1 2 3 4 5 6 7 X	1 2 3 4 5 6 7 Z X
	1 2 3 4 5 6 7 Z X	1 2 3 4 5 6 7 Z X	1	2	1 2 3 4 5 6 7 Z X	1 2 3 4 5 6 7 X	1 2 3 4 5 6 7 Z X
	1 2 3 4 5 6 7 Z X	1 2 3 4 5 6 7 Z X	1	2	1 2 3 4 5 6 7 Z X	1 2 3 4 5 6 7 X	1 2 3 4 5 6 7 Z X
	1 2 3 4 5 6 7 Z X	1 2 3 4 5 6 7 Z X	1	2	1 2 3 4 5 6 7 Z X	1 2 3 4 5 6 7 X	1 2 3 4 5 6 7 Z X
	1 2 3 4 5 6 7 Z X	1 2 3 4 5 6 7 Z X	1	2	1 2 3 4 5 6 7 Z X	1 2 3 4 5 6 7 X	1 2 3 4 5 6 7 Z X
	1 2 3 4 5 6 7 Z X	1 2 3 4 5 6 7 Z X	1	2	1 2 3 4 5 6 7 Z X	1 2 3 4 5 6 7 X	1 2 3 4 5 6 7 Z X

HIV/AIDS (HA) Module		
HA1. Have you ever heard of the virus HIV or an illness called AIDS?	Yes.....1 No.....2	1 = PROCEED 2 = END
HA2. Can people get infected with the AIDS virus because of witchcraft or other supernatural means?	Yes.....1 No.....2 Don't Know.....X	
HA3. Can people reduce their chance of getting the AIDS virus by using a condom every time they have sex?	Yes.....1 No.....2 Don't Know.....X	
HA4. Can people reduce their chance of getting infected with the AIDS virus by not having sex at all?	Yes.....1 No.....2 Don't Know.....X	
HA5. Can people get the AIDS virus from mosquito bites?	Yes.....1 No.....2 Don't Know.....X	
HA6. Can people get the AIDS virus by sharing food with a person who has AIDS?	Yes.....1 No.....2 Don't Know.....X	
HA7. Is it possible for a healthy-looking person to have the AIDS virus?	Yes.....1 No.....2 Don't Know.....X	
HA8. If a female teacher has the AIDS virus but is not sick, should she be allowed to continue teaching in school?	Yes.....1 No.....2 Don't Know/Not Sure/Depends.....X	
HA9. Would you buy fresh vegetables from a shopkeeper or vendor if you knew that this person has the AIDS virus?	Yes.....1 No.....2 Don't Know/Not Sure/Depends.....X	
HA10. If a member of your family became infected with the AIDS virus, would you want it to remain a secret?	Yes.....1 No.....2 Don't Know/Not Sure/Depends.....X	
HA11. Do you know of a place where you go to get such a test to see if you have the AIDS virus?	Yes.....1 No.....2	

Health Related Household Amenities		
What is the principal fuel used for cooking?	Firewood.....1 Charcoal.....2 Kerosene.....3 Gas.....4 Electricity.....5 Other.....7	
Do you cook indoors or outdoors?	Indoors.....1 Outdoors.....2	
What is the principal fuel used for lighting?	Firewood.....1 Charcoal.....2 Kerosene.....3 Gas.....4 Electricity.....5 Other.....7	
What is the main source of drinking water for members of your household?  **there is only one correct answer for this question.	Piped water.....1 Borehole.....2 Purified water from standpipe.....3 Protected well.....4 Unprotected well.....5 Dam.....6 River.....7 Collected rain water.....8 Other.....7	
Who usually goes to this source to fetch the water for your household? Probe: Is this person under age 15? What gender? Circle code that best describes this person that goes most of the time.	Female.....1 Male.....2 Female child (under 15).....3 Male child (under 15).....4 Not anyone specific.....5 Don't Know.....X	
How long does it take to go there to get the water and come back?	No. of minutes..... Don't Know.....X	

Health Related Household Amenities		
Do you always find water there?	Yes.....1 No.....2 Don't Know.....X	
Do children in the community complain of blood in their urine?	Yes.....1 No.....2 Don't Know.....X	
If your child had blood in their urine would you tell your neighbour or the teacher?	Yes.....1 No.....2 Don't Know.....X	
If your child had blood in their urine would you take him/her to the clinic?	Yes.....1 No.....2 Don't Know.....X	
How does this household primarily dispose of household waste?  Primary source only	Collected by government.....1 Community open dumping.....2 Dumped in compound.....3 Dumped in street/empty plot.....4 Burned.....5 Buried.....6 Composted.....7 Fed to animals.....8 Other.....Z	
What kind of toilet facility do members of your household usually use?	Flush toilet.....1 Ventilated improved pit latrine with slab cover.....2 Pit latrine with no slab cover.....3 Community shared pit latrine.....4 Pan/bucket.....5 Toilet in another house.....6 No toilet-free range.....7 Other.....Z	
In the past 12 months, were there months in which you did not have enough feed to meet your household needs?	Yes.....1 No.....2 Don't Know.....X	

Health Related Household Amenities		
If yes, why were you not able to meet your household's food need?	Could not produce enough food.....1 No money to buy food.....2 Not enough land to cultivate.....3 Not enough water.....4 Not enough labour.....5 Calamity (fire, disease, pests).....6 Other.....7	
How is your household food security situation compared to last year?	Better.....1 Same.....2 Worse.....3	
How would you rate your health?	Very healthy.....1 Fairly healthy.....2 Somewhat unhealthy.....3 Unhealthy.....4	
What do you think is the cause of your current health status?	Age.....1 Life style.....2 Environment.....3 Socio economic conditions in the country.....4 Don't know/Can't tell.....5 Other.....7	



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## APPENDIX 2: CONSULTATION GUIDANCE

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**INFORMATION TRACKING SHEET**

<b>CASA - 1000</b>		Consultation Team Member: _____		Date: _____	
Contact Name: _____		Phone: _____		_____	
Address: _____		Fax: _____		_____	
Town: _____		Email: _____		_____	
Land Location (local land description): _____					
KM post (Chainage): _____					
<i>Affiliation</i>					
Public: _____		Regulator: _____		_____	
NGO: _____		Government: _____		_____	
Indigenous: _____		_____		_____	
<i>Preferred Contact Method</i>					
Meeting: _____		Phone: _____	Email: _____	Fax: _____	
<b>Topics of Concern (Check all that apply)</b>					
<i>Environmental Topics</i>		<i>Economic</i>		<i>Technical Topics</i>	
:Fish and Fish Habitat		:Heritage Sites		:Transmission Line	
:Wildlife		:Social Impacts		:Safety	
:Water		:Social Benefits		:Reclamation	
:Air Quality		:Traditional Land Use		:Project Management	
:Soils/Terrain		:Community Involvement		:Engineering and Design	
:Vegetation		:Traditional Knowledge		:Construction	
:Noise		:Business Opportunity		:Operation	
:Land Use		_____		_____	
<b>Details</b>					
Add notes here...					
<b>Commitments</b>					
<b>Responsible Party(s)</b>					
<b>Follow-up 1</b>		_____		_____	
<b>Follow-up 2</b>		_____		_____	
<b>Follow-up 3</b>		_____		_____	



## CONSULTATION DATABASE EXAMPLE

ID	Stakeholder Name	Address	Town	Region	Country	Country Specific Land Identifier (TWP, Zone etc.)	Organization Affiliation	Organization Address	Phone Number Home
1	John Ramsey	347 Harris Street NW	Bomat	Bozark	Harerfast	Zone 123	None	407 - 14 Ave	W:(403) 319-6414
2	Michelle Cartwright	7894 Arlingotn Ave	Celista	Nazbut	Isbit	NE	Boston Green Company	795 Pulman Way	NA
3	Henry Luffa	NA	Peshwar		Pakistan		Ducks Unlimited	124 Old Jamrud Road	92-91-334353

Phone Number Work	Phone Number Cell	Interest	COMMENTS	Date of Comment	Response Needed	Response and Project Rep.	Date of Response	Issue Closed
F:(403) 319-3727		Owner	Landowner wants more information on soil erosion impacts	1/15/2011	Y	Soils expert contacted Mr. Ramsey and explained Impact	1/7/2011	Y
		Farms land	Resident wants information on impact of transmission line on cattle	1/9/2011	Y	Consultation rep. returned with pamphlet on impacts of transmission lines on cattle. Michelle Cartwright said it was not applicable to her cattle that were pure breads.	Pending	No
92-91-823359		NGO	Worried about harm to birds	15/9/2011			Pending	No



**GOVERNMENT AND LOCAL AUTHORITIES:**

Not only is it a requirement to consult with government and local authorities regarding the Project, it is essential that representatives in the various governmental departments and regions are up-to-date on Project activities as it is not uncommon that general public look to local authority for information. Government and local authorities should be notified and consulted prior to consultation with general public. For project success communication between Project Proponent, Government and Public should be facilitated.

During the SNC IESIA a number of government representatives and local authorities were consulted. In most cases this consultation occurred in 2007 more than three years before the writing of this report (May 2011). Information obtained during the IESIA may be outdated and needs to be confirmed or newly obtained. Continued consultation with these entities is integral for Project success if the Project is to move forward. The early involvement of these entities, with the Proponent and in turn with the public, facilitates the communication chain and the public consultation in general.

Follow-up with the departments and individuals listed in the SNC IESIA report would be an ideal start in re-presenting the Project and determining the appropriate individuals/departments to involve going forward. The SNC IESIA report included consultation with groups and representatives listed in Appendix 3. Presentation of the 'ESIA and ESMP of the Central Asia South Asia Electricity Transmission Project (CASA 1000): Feasibility Stage' report should occur with appropriate government departments and validation of information gathered during the IESIA is needed, or of new issues not previously identified should be included. These departments and individuals should be confirmed by the ICT through desktop research and phone calls.

**PAKISTAN:**

The SNC IESIA notes the following consultation that has occurred:

Stakeholder	Department	Contact and Title	Issues/Comments
Agriculture University Peshwar	Agronomy Department	Mr. Zarshad Khan (Chairman, Department of Agronomy)	Ayub Afridi Tribe has 1000-2000 acres of agriculture land from Bara Grid Station to Sheikh Muhammadi Grid Station. The department has no future plan in the proposed project area. Agriculture land is a major concern near Sheikh Muhammadi Grid Station.
NWFP Wildlife Department	NWFP Wildlife Department	Mr. Muhammad Mumatz Malik (Chief Conservator, Wildlife)	The project may cause disturbance of wildlife during implementation and construction phase Migratory birds may touch the wires during their flight Wild life department is not working in the project area at present that is why present statistics are not available. Future Plans for the COI include Wildlife

Stakeholder	Department	Contact and Title	Issues/Comments
			conservation and management in FATA.
NWFP Forest Department	Khyber Forest Division	Mr. Fazal Elahi (Sub divisional Forest Officer)	The existing plants in the area will be damaged, particularly the area, in which the Forest Department has invested money and spent time. Plantation will be damaged due to project activities; Future plans include the establishment of nurseries and plantation. The total area of Khyber Agency is about 64,4618 acres and the forest cover is 27,545 acres, which is about 4.27 percent of the forest cover.
National Highway Authority (NHA)	N.H.A. Office	Mr. Hameed Hussain (Assistant Director, Peshawar Torkhum Express Way)	Alignment of Expressway is not confirmed yet, because another alignment has been proposed. So, the concerns are not known. Future plans include the existing road from Torkhum to Takhta Baig may be extended in future instead of expressway. The first option of extension is from Jamrud and second option is from Riby Road. NHA department has no major concern.
Irrigation and Power Department (IPD)	IPD Warsak Road.	Mr. Pervaiz Khan Jadoon (Chief Engineer)	The department has no objections related to the project. The department has no future plan for about two years in the proposed T/L area. (2007)
Environmental Protection Agency (EPA), Peshawar	EPA, Peshawar	Mr. Liaqat (Assistant Director)	During construction Project activities will cause damage to the plants and some animal's species. The encroachment of transmission line may also cause the migration of animals from the area. Wild life may be affected. The department has no future plan along the project corridor.

**TAJIKISTAN:**

The SNC ISIA notes that prior to beginning public consultations the following stakeholders were identified:

- Project Affected Persons (PAPs);
- Local general population;
- Local administration – political agent, assistant political agent;
- Agriculture Department;
- Environmental Protection Agency;
- Jamoat governments;
- Irrigation departments; and

- Power Department.

Departments and individuals that were consulted are:

Stakeholder	Department	Contact and Title	Issues/Comments
Kurgan Tyube, Oblast Khukumat, Oblast Statistics Agency	Deputy Chairman of the Khatlon Oblast	Gulmatov M.G	Plantations may be damaged due to project activities; Agricultural land may be affected due to loss of crops and trees; Project activities may cause damage to livestock; Interference with radio and television programs; Improved local electricity supply; and • Impact of EMF on health.
	Deputy Chairman of the Khatlon Oblast on matters of water supply and dehkan farms	Abdurahmanov –	
	Head of the Khukumat Economics Management	D. Mirzoev	
	Chairman of Oblast Statistics Agency	Shokirov Shodmon Shokirovich	
City of Sarband: the Khukumat and  Jamoats.	Mayor	Radzhabov Hukmatullo Fazliddinovich	
	Head of the Khukumat Administration	Mukhsiddinov Zainiddin	
	Head of Statiscs Department	Khakimov Kurbon	
	Head of Labour Dept	Nazaraliev Kurbon	
	Head of Economics and Trade Dept	Yatimov Nurmahmad	
	Chairman of J. Guliston kishlak	Kenzhaev Gulyam Rasulovich	

Stakeholder	Department	Contact and Title	Issues/Comments
	Botrobod		
	Chairman of the Makhallin Committee	Sangaliev Emomali	
	Chairman of the Makhallin Committee	Dzhurahonov Hamzai Hodzhamurod	
Vakhsh rayon The Khukumat and jamoats	Chairman of the Rayon	Sattorov Aloviddin Mirzoevich	
	First Deputy Chairman	Huseinov Saiddzhalol Rahmatovich	
	Chief Architect of the Rayon	Davlatov Sherali	
	Chief specialist of Land Management Committee	Alihonov Dzhurahon	
	Secretary of J.Kirov	Madmusoev Nosirdzhon	
	Chairman of J..Mashal	Sharipov Mahmadi	
	Chief Specialist	Rahmonov Amonullo	
	Chairman of the environment committee district Department	Kadyrov Manon	
	Chief specialist of the environment committee district	Kholboev Alimahmad	

Stakeholder	Department	Contact and Title	Issues/Comments
	Department		
	Chief specialist of the department for flora and fauna department	Shomurodov Hojamurod	
Rumi Rayon, the Khukumat and jamoats	Chairman of the Rayon	Sadulloev Habibullo Naimovich	
	First Deputy Chairman	Nazhmiddinov Mukim Pirovich	
	Statistics Department	Hamroev Olimhudzha	
	Land Management Committee	Hallo Mahmadsharif	
	Deputy Chairman	Mahmudov Saidali	
	Department of State Supervision of Natural Resources Disposal	Department of State Supervision of Natural Resources Disposal	
	Deputy Chairman of J. Guliston	Samadov Abdurahmon	
	Secretary- - kishlak Toshrobod	Mirzoev Dzhavharsho	
Kumsangir rayon: the Khukumat and jamoats	Head of Administration	Umratulloev Ajnullo	Their attitude to T/L laying is positive. There is no regular economic activity in this zone

Stakeholder	Department	Contact and Title	Issues/Comments
	Chairman of Jamoat – Pyanj	Burhanov Murtazo	
	Chairman of Jamoat –Dusti	Babadzhanov Sharif	
	Chairman of Jamoat _Krupskayy	Eshhamadov Rahim	
	Chairman of Jamoat –Yakkadin	Kuganov Kuchar	
	Chairman of Jamoat –Kumsangir	Boimatov Toir	

**AFGHANISTAN:**

The SNC IESIA notes that in Afghanistan, there are three types of systems dealing with the social, cultural and administrative issues, i.e. (i) Afghanistan laws, (ii) customary rights/ tribal system and (iii) Islamic law (Sharia).

A number of consultative meetings were held during the social/ impact assessment survey. The participants included Ministry of Energy and Water (MoE&W) staff, Govt. officials, and representatives of municipalities and other ministries/ Departments. The purpose of the consultations was to share the information about the project activities and to get feedback about the project.

Consultations were carried out at the ministries offices in Kabul and at 20 different locations along the project corridor. These included: Shir Khan Border, Madrasa area, Omarkhyel village, Doshi, Khanjan, Jabul Saraj, Qara Bagh, Qalire- Moradbig, Deh Sabs, Mula Omar area, Surubi, Tangi Abrishom, Mashal-e-Kamar, Kakas, Aziz khanka, Bella village, Marko, Gerdi Ghous, Oaka and Shaheed Mol.

Other ministries and departments that may require consultation include:

- Ministry of Interior;
- Ministries agriculture & food;
- Ministry of public works,
- Ministry of Communications, other
- Other provincial/ district agencies:
  - land administration,
  - municipalities,
  - councils, and
  - community shuras/ jirgas).

**KYRGYZ REPUBLIC**

The SNC IESIA has limited information on public consultation that occurred within the Kyrgyz Republic. However, the following departments are likely to need consultation:

- The State Agency for Environmental Protection and Forestry (SAEPF) is the key institution responsible for the establishment and implementation of environmental policy in Kyrgyz Republic.
- The Department of the State Environmental Review under the SAEPF is responsible for reviewing environmental assessment documents for projects of national significance.

- Ministry of Health (safety and health issues);
- Ministry of Emergency Situations (natural hazards), and its subsidiary agency Kyrgyz Hydromet (KHM, or Hydromet, responsible for ambient air and water quality monitoring);
- Ministry of Agriculture (agricultural issues)
- Ministry of Natural Resources (mineral resources, road construction materials, and quarries);
- Local administrations (social issues, land use, etc); and
- State Preservation Office.

The onus is on the ICT to determine other relevant departments for consultation in Kyrgyz Republic.

## **EXISTING COMMUNITIES CONSULTATION INFORMATION**

### **COMMUNITIES**

During the SNC field studies various communities were identified as being within close proximity of the centre line. This list may not be inclusive and the onus is on the ICT to identify any additional communities, and include them in the consultation activities going forward. Further identification can be performed by review of the 'ESIA and ESMP of the Central Asia South Asia Electricity Transmission Project (CASA 1000): Feasibility Stage' alignment sheets. It should also be noted that even though the COI has been predetermined to be 1000 metres from centre line for the Kyrgyz Republic to Tajikistan (northern line) and 250 metres from centre line for the Tajikistan to Afghanistan to Pakistan (southern line), communities outside of the COI but within close proximity need to be consulted as it is likely that community members are land users within the COI, and/or could be directly or indirectly affected by the Project. Community consultation occurred to some degree with the towns mentioned in the country sections of Appendix 4. There is little preliminary information for the Kyrgyz Republic provided for this topic in the SNC report.

### **TAJIKISTAN**

In Tajikistan, the SNC ISIA determined that all lands within the COI are State property, as all land is state-owned. Land use is approved/permited by the State through the local offices of the State Land Committee and district administrative (Hukumat – bodies of executive authority) offices.

During the SNC field survey, it was noted that there are 11 villages/ towns/ settlements located within 2000 m of the centreline. Among these the major communities are:

- Dobrovolsky,
- Jangiabad,
- Zamini Nav,

- Ok-Gaza,
- Guliston,
- Ustoi Toimas,
- Tuyatosh,
- Bulokdasht,
- Khazonguzar,
- Guliston, and
- Sangtuda.

### **PAKISTAN**

In Pakistan the SNC report describes the northern 50 km of land as held as communal property, while from Km 50 to 71, the land is distributed by the relative community to individuals for land use.

The SNC report further notes that there are 27 villages/ towns/ settlements in the vicinity of the COI, and of these only 5 are located within the COI. The report also comments that the main tribes located along the route are the Afridi, Shinwari, Mullagori and Shalmani. Each tribe has sub-tribes / clans each with their own traditions and customs. All land and other natural resources in the COI are tribally owned and managed.

The ICT should confirm the communities in close proximity to the COI through their local expertise and the 'ESIA and ESMP of the Central Asia South Asia Electricity Transmission Project (CASA 1000): Feasibility Stage' alignment sheets. The SNC identified villages/settlements/towns in the vicinity of the COI are:

- Torkham,
- Gagra,
- Landi Kotal,
- Shalman village,
- Ayub Afridi Fort,
- Sadu Khel,
- Mari Khel,
- Wali Khel,

- Malik Rehmatulla Kalay,
- Nadar Khel,
- Sheikhwai,
- Phrangsang,
- Ali Masjid,
- Lala Chhina,
- Bhagarai checkpost,
- Surkamar,
- Taidi Bazar,
- Shahkass Chawk,
- Shlober,
- Jamrud,
- Hayatabad,
- Bara Bazar,
- Sheikh Khan,
- Mushterzai,
- Moshokhel,
- Suleman Khel, and
- Sheikh Muhammadi.

## **AFGHANISTAN**

The SNC report identifies 26 villages/ towns/settlements along the project corridor, however further states that only 8 located in closer vicinity of the COI. The numbers and communities should be confirmed through ICT expertise and the 'ESIA and ESMP of the Central Asia South Asia Electricity Transmission Project (CASA 1000): Feasibility Stage' alignment sheets. The names of the 8 villages are:

- Omarkhyel,
- Bamyan,

- Topdara ,
- Oarabagh,
- Cheshma-e-Dogh,
- Oala-e-Moradbig,
- Mahipar, and
- Marko Bazar.

The SNC report notes that all land and natural resources within the COI are tribally owned and identifies the main ethnic groups/ tribes located along the route as the: “Jabar Khel, Ahmadzai, Kalo Khel, Mohmand, Panjshiri, and Ibrahim Khel”.

#### **KYRGYZ REPUBLIC**

The SNC IESIA has no information on communities that were consulted. The ICT, through their local knowledge and use of the ‘ESIA and ESMP of the Central Asia South Asia Electricity Transmission Project (CASA 1000): Feasibility Stage’ alignment sheets, should work to identify communities and stakeholders.



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## APPENDIX 3: ALIGNMENT SHEETS

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105 Alignment Sheets to follow on DVD



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## APPENDIX 4: MAPS OF PROPOSED TRANSMISSION ROUTES

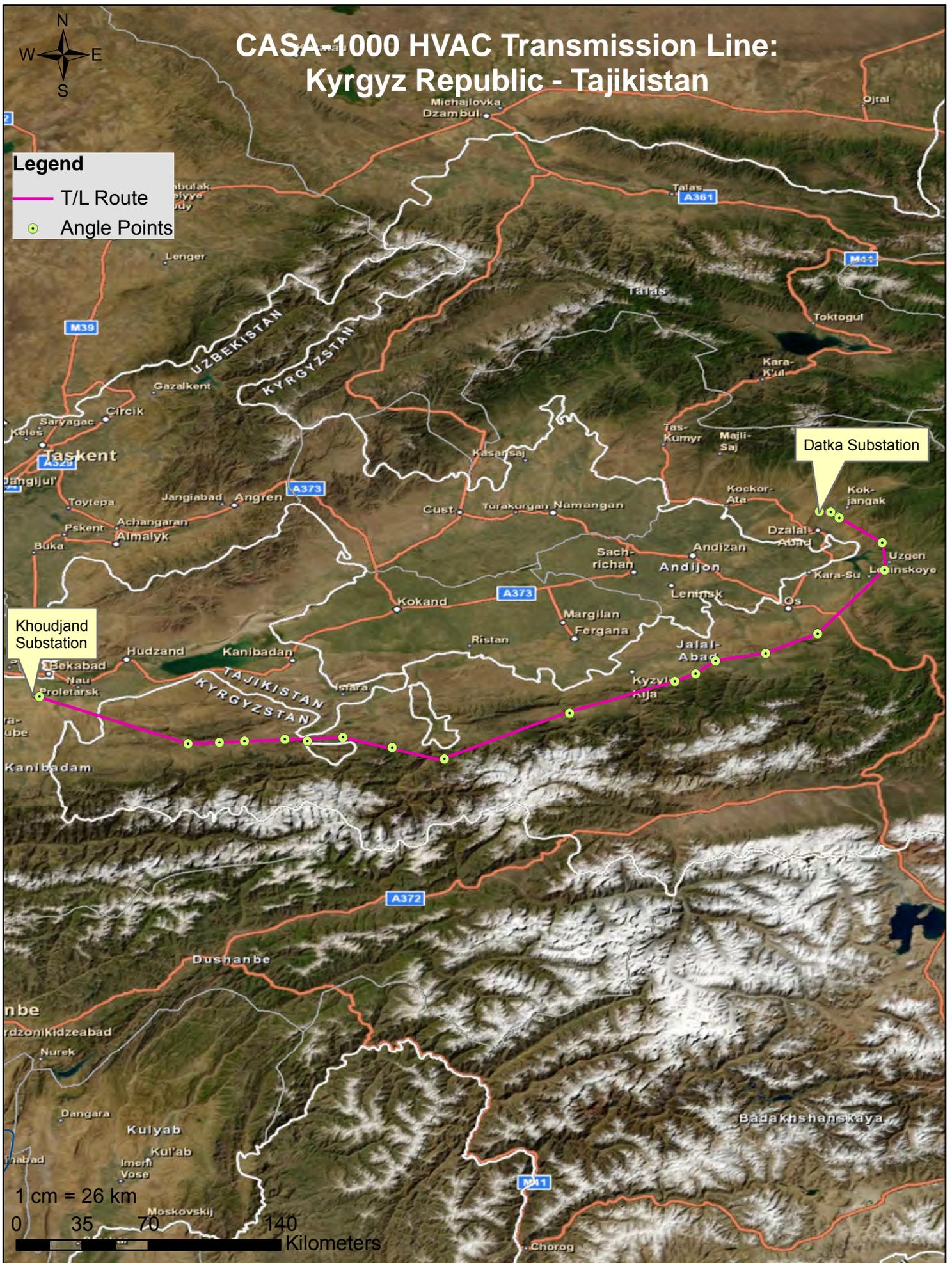
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# CASA-1000 HVAC Transmission Line: Kyrgyz Republic - Tajikistan



## Legend

- T/L Route
- Angle Points



# CASA - 1000 HVDC Transmission Line: Tajikistan-Afghanistan-Pakistan

**Legend**

- T/L Route
- Angle Points

