

GEORGIA ELECTRICITY TRANSMISSION NETWORK DEVELOPMENT PROJECTS

Environmental and Social Impact Assessment

Volume 8 Environmental and Social Management Plan (ESMP)

Document 8.2 Transmission line ESMP

Prepared for: GSE

SLR Ref: 901.12.1
Version No: #1
July 2019



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Acronyms

Acronym	Description
AA	Appropriate Assessment
AC/DC	Alternating current/direct current
AD	Anno Domini (also known as Common Era)
AMSL	Above mean sea level
AOP	Protected Designation of Origin
APA	Agency of Protected Area
AIS	Air insulated switchgear
ASL	Above Sea Level
BC	Before Christ (also known as Before Common Era)
BCoW	Biodiversity Clark of Works
BD	Bird Directive
[BIO-N]	Measure number N committed in Volume 3 Biodiversity of the ESIA Report
BP	British Petroleum
[CC]	Environmental and social management actions under the responsibility of the Contractor relevant to both substations and transmission line
CCTV	Closed circuit Television
CENN	Caucasus Environmental Network
CESMP	Construction Environmental and Social Management Plan
CH	Critical Habitat
CHS	Community Health and Safety
CLOs	Community Liaison Officers
[CO]	Construction
CSE	Cable Sealing End
dB(A)	Decibels (A weighted)
[DD]	Detailed design
EBRD	European Bank for Reconstruction and Development
EIA	Environmental Impact Assessment
EHS	Environmental, Health and Safety

Acronym	Description
ELF	Extremely Low Frequency
EMF	Electromagnetic Fields
ENTSO	European Network of Transmission System Operators' for Electricity
EPC	Engineering-Procurement-Construction
E&S	Environmental & Social
ERS	External Relations Stakeholder
ESHS	Environment, Social, Health and Safety
ESIA	Environmental & Social Impact Assessment
ESMP	Environmental & Social Management Plan
ESMS	Environmental and Social Management System
EU	European Union
FAO	Food and Agriculture Organisation of the United Nations
[GC]	Government of Georgia E&S management actions
GE00000X	Candidate Emerald Site identifier
GEL	Georgian Lari
GEOSTAT	National Statistics Office of Georgia
GIP	Good International Practice
GIS	Gas insulated switchgear
GLAC	Guide to Land Acquisition and Compensation
GLVIA	United Kingdom Guidelines for Landscape and Visual Impact Assessment
GRC	Grievance Resolution Committee
GRM	Grievance Resolution Mechanism
GSE	Georgian State Electrosystem
GVWR	Gross Vehicle Weight Rating
ha	hectare
HD	Habitats Directive
HDV	Heavy Duty Vehicle
HGV	Heavy Goods Vehicle
HPP	Hydropower Project
H&S/HS	Health and Safety

Acronym	Description
HSMS	Health and Safety Management System
HVDC	High Voltage Direct Current
[HYD-N]	Measure number N committed in the Hydrology, Geology and Geohazards Assessment in Volume 5 Physical Environment of the ESIA Report
Hz	Hertz
IAS	Invasive Alien Species
IBA	Important Bird Area
ICNIRP	International Commission on Non-Ionizing Radiation Protection
IDP	Internally Displaced Persons
IFC	International Finance Cooperation
IFC PS	IFC Performance Standards
ILO	International Labour Organization
JSCNH	Developer of Nenskra HPP
Key Biodiversity Area	KBA
KfW	KfW Development Bank
kHz	Kilohertz
km	Kilometre
KM	Kilometre markers along each proposed transmission line
kV	Kilovolt
L&V	Landscape and visual
LARCF	Land Acquisition and Resettlement Compensation Framework
LNK	Lower Namakhvani
LVIA	Landscape and visual impact assessment
[LVIA-N]	Measure number N committed in the Landscape and Visual Assessment in Volume 5 Physical Environment of the ESIA Report
m	Metre
MEPA	Ministry of Environmental Protection and Agriculture
mASL	Metres above sea level
MCP	Management of Change Procedure
MLARO	Municipal Land Acquisition and Resettlement Office

Acronym	Description
MoESD	Ministry of Economy and Sustainable Development
MoF	Ministry of Finance
MVA	Mega volt-ampere
MW	Megawatt
NACHP	National Agency for Cultural Heritage Preservation of Georgia
NACRES	Centre for Biodiversity Conservation and Research
NAPR	National Agency of Public Registry
NBSAP	The 2 nd National Biodiversity Strategy and Action Plan
NGO	Non-Governmental Organisation
NOI	Noise ESMP action
NOx	Oxides of nitrogen
NP	National park
NTS	Non-Technical Summary
[OC]	Owner Construction ESMS management actions
OHL	Overhead line
[OP]	Operation
PAH	Project Affected Household
PAP	Project Affected Person(s)
PBF	Priority Biodiversity Feature
PCBs	Polychlorinated Biphenyls
PDO	Protected Designation of Origin
PPE	Personal Protection Equipment
PR	EBRD Performance Requirement
PRRC	Property Rights Recognition Commission
PS	KfW Performance Standard
RAP	Resettlement Action Plan
RMT	Resettlement Management Team
RoW	Right of way
SEP	Stakeholder Engagement Plan
SF ₆	Sulphur hexaflouride

Acronym	Description
[SOC-N]	measure number N committed in Volume 4 Social of the ESIA Report
SPAB	Special Protection Area for Birds
TMP	Traffic Management Plan
TYNDP	GSE's Ten Year Network Development Plan of Georgia
UK	United Kingdom
UNECE	United Nations Economic Commission for Europe
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNK	Upper Namakhvani
VSC	Valued Social Components
WHO	World Health Organisation
WHS	World Heritage Site

Preamble

This document is the **Transmission line Environmental and Social Management Plan (ESMP)** of the Georgian Electricity Transmission Network Development projects (Project). It forms **Document 8.2 of Volume 8** of the Environmental and Social Impact Assessment (ESIA) Report. This document should be read in conjunction with the **Project-wide ESMP, Document 8.1, Volume 8**.

The Project being developed by the Georgian State Electrosystem (GSE) comprises the construction of new and in some cases rehabilitation of existing transmission lines and substations. In summary, the Project is formed into 5 geographical component areas (Project Components), Components A, B, C1, C2 and D. Each new or rehabilitated line and substation is given a Project name which is used throughout the documents. The following table provides an overview of the Project Components and the Project names.

Component	Line description	Project name
A - Samtskhe-Javakheti & Imereti	Tskaltubo to Akhaltsikhe and on to Turkey border at Vale: - 500kV Tskaltubo to Akhaltsikhe Substation - 400kV Akhaltsikhe to Turkey border (and on to Tortum in Turkey) - Extension to the existing Akhaltsikhe Substation	Sairme line Tao line Akhaltsikhe extension
B - Guria	Ozurgeti to Zoti HPP and connection from Ozurgeti to the Paliastomi line: - 110kV Ozurgeti to Zoti HPP powerhouse - 220kV Ozurgeti to Paliastomi loop in connection - 110/220kV Ozurgeti Substation	Guria line Paliastomi loop Ozurgeti Substation
C1 - Svaneti	Nenskra to Mestia: - 110/220/500kV Nenskra Substation - 110kV Nenskra Substation to Mestia HPPs -500kV Kavkasioni loop in loop out to Nenskra Substation	Nenskra Substation Mestia line Kavkasioni loop
C2 – Racha Lechkhumi & Imereti	Lajanuri connections to Kheledula HPP, Oni HPP and Tskaltubo: - 110/500kV Lajanuri Substation - 220kV Lajanuri to Oni HPP - 220kV Lajanuri to Kheledula HPP - 500kV Lajanuri to Tskaltubo - 220kV Rehabilitation of the existing 220kV Derchi line from Lajanuri to Tskaltubo, with new connections into Namakhvani Cascade HPP - 220kV Lajanuri Substation to Lajanuri HPP	Lajanuri Substation Oni HPP line Kheledula HPP line Lechkhumi line New Derchi line Lajanuri HPP line
D - Kakheti	Reinforcement of the transmission infrastructure in Kakheti: - 110/220kV line from Gurjaani to Telavi, constructed on 220kV towers - 110kV line from Telavi to Akhmeta, constructed on 220kV towers - 110kV loop to Tsinandali - 110kV loop to Mukuzani - Rehabilitation and extension of 110kV Akhmeta Substation - Rehabilitation and extension of 110/220kV Telavi Substation	Gurjaani line Akhmeta line Tsinandali line Mukuzani line Akhmeta Substation Telavi Substation

Component	Line description	Project name
	- Rehabilitation of 110kV Tsinandali Substation - Rehabilitation and extension of 110kV Mukuzani Substation - Rehabilitation and upgrade of 110/220kV Gurjaani substation	Tsinandali Substation Mukuzani Substation Gurjaani Substation

The ESIA Report is formed of a number of volumes and documents, as follows:

- Volume 1 – Non Technical Summary;
- Volume 2 –Project Definition – including Project introduction, need and alternatives and project description;
- Volume 3 – Biodiversity:
 - Document 3.1 Biodiversity Project-wide Assessment
 - Document 3.2 Biodiversity Project Component Specific Assessment
 - Document 3.3 Biodiversity Figures
 - Document 3.4 Biodiversity Appendices
- Volume 4 – Social – including assessments on people, communities, the economy, cultural heritage and Electromagnetic Fields (EMF):
 - Document 4.1 Social Project-wide Assessment
 - Document 4.2 Social Project Component Specific Assessment
- Volume 5 – Physical Environment– including assessments on landscape and visual, noise, air quality:
 - Document 5.1 Physical Environment Project-wide Assessment;
 - Document 5.2 Physical Environment Project Component Specific Assessment;
- Volume 6 – Stakeholder Engagement Plan (SEP);
- Volume 7 – Land Acquisition, Resettlement and Compensation Framework (LARCF);
- Volume 8 – Environmental and Social Management Plan (ESMP):
 - Document 8.1 Project-wide ESMP;
 - **Document 8.2 Transmission Lines ESMP (this Report);**
 - Document 8.3 Substations ESMP.

1.0 Introduction

1.1 Project Overview

This report is the **Transmission Line Environmental and Social Management Plan (ESMP)** specific to **transmission lines** (overhead and underground sections) of the Georgian Transmission Network Development Project (Project). It forms Document 8.2 of the Volume 8 of the ESIA Report. It should be read in conjunction with Document 8.1 Project-wide ESMP which sets out the framework of the ESMP, roles and responsibilities, project-wide mitigation measures and the requirements (referred to as *specifications*) for contractors, GSE and others. This **Transmission Line ESMP** focuses specifically on the aspects relevant only to transmission lines and the construction of associated infrastructure, such as access tracks. It provides mitigation measures that apply to all transmission lines irrespective of location and also measures specific to a Project Component, where appropriate.

This **Transmission Line ESMP** is a draft prior being made available for public disclosure. Feedback on the ESIA and ESMP during the public disclosure process could affect the content of the final ESMP.

1.2 Structure of the Transmission line ESMP

This document, Document 8.2 of the **ESMP (Volume 8)**, has been structured as follows:

- Section 2 summarises the Project’s commitments to mitigate or compensate the impacts predicted by the ESIA that are specific to transmission lines;
- Section 3 describes the measures that must be adopted by the transmission line Contractors employed to deliver the Project irrespective of the Project Component being work upon;
- Section 4 outlines the specific measures that must be adopted by the transmission line Contractors in each Project Component; and
- Section 5 outlines the measures that are the responsibility of GSE and the Implementation Consultant.

1.3 ESMP document schedule

Table 1.1 lists the document schedule that will be prepared by the Contractor that are specific to **transmission lines** and are in addition to those identified in Section 2.8 of the **Project-wide ESMP**. The justification and the content of these documents are further described in the referred specification references listed in Table 1.1.

TABLE 1.1 ESMP MANAGEMENT PLAN DOCUMENTS FOR TRANSMISSION LINES

Documents	Specification reference
Documents to be prepared by the Contractor in each Project Component	
Access Track Management Plan	3.2.1
Soil Contamination Risk Assessment Report	3.6.1
Unexpected Soil Contamination Protocol	3.6.1
Documents to be prepared by the Contractor for Component C2	
Transmission Line Dismantling Management plan	4.5.2
Documents to be prepared by the Contractor for Component D	

Documents	Specification reference
Transmission Line Dismantling Management plan	4.6.1

2.0 Summary of ESIA Impacts and Commitments for Transmission Lines

2.1 Introduction

This section sets out the **transmission line** commitments or measures being made by the Project to control the potential impacts of the Project. Table 2.1 summarises the Project-wide and Project Component **transmission line** impacts identified and the corresponding mitigation and/or compensation which has been identified in the ESIA Report (Volume 3 to 5). This table forms part of the 'Commitments Register' for the Project. The other impacts and commitments are outlined in Table 3.1 of the **Project-wide ESMP**.

These measures are all translated into implementable specifications (management action, schedules, and responsibilities) in sections 3, 4 and 5 of this **Transmission line ESMP**. For the sake of tracking and consistency, Table 2.1 identifies which specification of the **Transmission line ESMP** addresses the commitment made in the ESIA Report.

Each commitment is given an acronym as follows:

- for the timing of impact:
 - [DD]: Detailed Design
 - [CO]: Construction; and
 - [OP]: Operation.
- for the relation between commitments made in this ESMP and measures committed in the ESIA Report:
 - [BIO-N]: measure number N committed in Volume 3 Biodiversity of the ESIA Report;
 - [SOC-N]: measure number N committed in Volume 4 Social of the ESIA Report;
 - [L&V-N]: measure number N committed in the Landscape and Visual Assessment in Volume 5 Physical Environment of the ESIA Report;
 - [NOI-N]: measure number N committed in the Noise Assessment in Volume 5 Physical Environment of the ESIA Report.
 - [HYD-N]: measure number N committed in the Hydrology, Geology and Geohazards Assessment in Volume 5 Physical Environment of the ESIA Report; and

TABLE 2.1 SUMMARY OF ESIA REPORT IMPACTS AND COMMITMENTS FOR TRANSMISSION LINES

Transmission Line Potential Impact	Timing	ESIA Report Mitigation Ref	Mitigation Commitment made	Implementation Responsibility	ESMP Section and Specification Ref
Volume 3 Biodiversity – All transmission lines –					
Loss of habitat and habitat conversion and subsequent disturbance and displacement impacts on terrestrial fauna	DD	BIO-2	Avoid sensitive areas, mapped during the Biodiversity assessment (Volume 3 of the ESIA), when finalising the locations of towers, siting of access tracks, construction compounds, accommodation camps and any other infrastructure not yet defined by the feasibility study in line with the requirements of EBRD PR6.	Contractor	3.2.1
	CO	BIO-3	The Biodiversity Clerk of Works, employed by GSE, is present on-site to undertake any necessary micro-siting of construction works (e.g. tower locations and construction work footprint) to avoid any sensitive features found and in particular seeks to minimise and avoid the removal of trees especially any red list species.	GSE	5.3.2
	DD	BIO-4	Implementation of a change process for the environmental assessment of new transmission line routing if proposed to be located outside the assessment corridor of this study to be in line with the requirements of EBRD PR6.	Contractor	3.3.1
	DD	BIO-7	Reuse of existing paths and tracks for transmission line access.	Contractor	3.2.1
	DD	BIO-8	Tracks to be mapped prior to works taking place; in situ tracks to be used in preference to building new tracks.	Contractor	3.2.1
	DD	BIO-9	For areas which require new tracks, follow the implementation hierarchy (set out in the Biodiversity Assessment Document 3.1, Volume 3) to limit need for, and to justify requirement for new tracks.	Contractor	3.2.1
	DD	BIO-10	Provision of a construction plan for tracks which are to be newly created or upgraded that avoids the most sensitive areas (Figure 11	Contractor	3.2.1

			a to j in the Biodiversity Project Component Assessment (Document 3.3), minimises vegetation disturbance and provides measures for land slip and erosion control.		
Tree removal and height reduction within the right of way	DD	BIO-12	Retention of riparian habitats where practicable.	Contractor	3.4.3
	DD	BIO-13	Retention of ground cover where practicable.	Contractor	3.4.3
Positive impact on invertebrate assemblage, woodpeckers and bats	CO	BIO-19	Retention of one tree trunk per 200m within the right of way and retain any deadwood, prioritising hardwood species such as beech or hornbeam	Contractor	3.5.1
Bird injury and mortality due to collision with overhead transmission lines	DD	BIO-23	All transmission line earth wires to be fitted with bird deflectors, where they pass over watercourses which are 5m wide or more.	Contractor	3.5.1
Volume 3 Biodiversity – Transmission line – Component A					
Loss of sensitive habitat	DD	BIO-24	Suitably qualified/experienced botanist/biodiversity expert to survey sensitive area (alpine scrub (KM46 to KM55) and sweet chestnut woodland (KM33 to KM37)) during the detailed design stage to locate the least impact locations for towers, access tracks and other related infrastructure.	Contractor	4.2.1
Loss of Georgian Red List species	CO	BIO-25	Use Georgian Red List species such as sweet chestnut preferentially in the site reinstatement of temporary construction working areas.	Contractor	4.2.2
Loss of trees in forests	CO	BIO-27	Forest loss to be compensated for through the implementation of a Reforestation Management Plan specific to each component, to ensure that no net loss of forest habitat occurs due to the Project.	GSE	5.3.1
Loss of roosting habitat for bats	CO	BIO-28	Placing of 200 bat boxes on the Sairme line within the G1.7D habitats or adjacent woodland	Contractor	4.2.1
Disturbance of Sturgeon spawning grounds in the Rioni River	CO	BIO-29	No construction activities to take place within the Rioni River. The only exception to this is passage by horse, or foot, use of a low-pressure vehicle (outside the spawning season April – July) for conductor line stringing.	Contractor	4.2.1

Loss of habitats and impacts on birds	CO	BIO-26	New access tracks between KM55 and KM59 are not to be constructed. Instead access is to be gained with the use of pack animals, low pressure tyre vehicles or helicopters	Contractor	4.2.1
Bird injury and mortality due to collision with overhead transmission lines	CO	BIO-30	Bird diverters to be installed on the earth wire of the Sairme line between KM71 and KM41..	Contractor	4.2.1
Cumulative impacts due to Component A and B due to bird mortality and injury due to collision with transmission lines in the Adjara-Imereti Ridge Important Bird Area.	OP	BIO-31	Implement a bird monitoring programme for those sections of Components A and B within the Adjara-Imereti Ridge Important Bird Area (IBA) to assess the in-combination effects of raptor mortality (collision) and black grouse population levels.	GSE	5.3.1
Disturbance impacts to lekking and breeding black grouse.	CO	BIO-32	Construction not to be undertaken during the black grouse lekking (first three weeks in May) and breeding season (May to July) in sensitive areas between KM 64 – KM 62 and KM 60 – KM 46, unless preconstruction surveys (undertaken by the Biodiversity Clerk of Works) have been undertaken 1 – 2 weeks before the commencement of work and no signs of black grouse or snowcock are found..	Contractor/GSE	4.2.1/5.3.1
Implementation of conservation measures in order to provide measures to offset biodiversity impacts of the Project	OP	BIO-33	Set up biodiversity data sharing agreement with stakeholders for protected areas (IBA, Special Protection Area Birds (SPAB), national park (NP) and candidate Emerald site), for past and future biodiversity data relating to this Project for the Sairme Line	GSE	5.3.2
	OP	BIO-34	GSE to fund and agree funding cap, and work with BirdLife International, to write an Imereti-Adjara IBA target species management plan for Caucasian black grouse.	GSE	5.3.2
Volume 3 Biodiversity – Transmission line – Component B					
Loss of sensitive habitat	DD	BIO-35	During detailed design, the Contractor shall conduct biodiversity surveys of the transmission line route through KM16 and KM41, in particular, the pontine oak stands where the route passes near to the Managed Reserve of pontine oak to locate the least impact	Contractor	4.3.1

			locations for towers, access tracks and other related infrastructure.		
	CO	BIO-36	BCoW to survey sensitive areas where the route passes near to the Managed Reserve of Pontine Oak to ensure that the siting of towers and construction works avoids the unnecessary removal of pontine oak trees.	GSE	5.3.2
Loss of trees in forests	CO	BIO-27	Forest loss to be compensated for through the implementation of a Reforestation Management Plan specific to each component, to ensure that no net loss of forest habitat occurs due to the Project.	GSE	5.3.1
Bird injury and mortality due to collision with overhead transmission lines	CO	BIO-37	Bird deflectors to be installed on earth wires between KM7 to KM9, KM12 to KM16 and KM40 to KM43 to reduce collision risk.	Contractor	4.3.1
Disturbance impacts to lekking and breeding black grouse.	CO	BIO-38	Construction not to be undertaken during the lekking (first three weeks in May) and breeding season (May to July) in sensitive areas between KM19 to KM20 and KM24 to KM28, unless preconstruction surveys (undertaken by the Biodiversity Clerk of Works) have been undertaken 1 – 2 weeks before the commencement of work and no signs of black grouse are found.	Contractor/GSE	4.3.1/5.3.1
Black grouse injury or mortality due to collision with towers	CO	BIO-39	Bird deflectors to be added to the base of towers and up to 5m in height to increase the visibility of the tower structure to prevent/reduce the risk of collision by black grouse between KM19 and KM20 and KM24 and KM28.	Contractor	4.3.1
Implementation of conservation measures in order to provide measures to offset biodiversity impacts of the Project	OP	BIO-33	Set up biodiversity data sharing agreement with stakeholders for protected areas (IBA, SPA NP and candidate Emerald Site), for past and future biodiversity data relating to this Project Component A and B	GSE	5.3.2
	OP	BIO-34	Agree funding cap, and work with BirdLife International, to write an Imereti-Adjara Ridge IBA target species management plan for Caucasian black grouse.	GSE	5.3.2
Volume 3 Biodiversity – Transmission line – Component C1					
Loss of sensitive habitats	DD	BIO-40	During detailed design, the Contractor would conduct biodiversity	Contractor	4.4.1

			surveys of the transmission line route through KM11 and KM22 to locate the least impact locations for towers and access tracks and other infrastructure.		
Loss of Georgian Red List species	CO	BIO-41	Use Georgian Red List species such as sweet chestnut preferentially in the reinstatement/revegetation of temporary construction working areas including access track sides, borrow pits, compounds, accommodation camps and temporary laydown area restoration.	Contractor	4.4.2
Loss of trees in forests	CO	BIO-27	Forest loss to be compensated for through the implementation of a Reforestation Management Plan specific to each component, to ensure that no net loss of forest habitat occurs due to the Project.	GSE	5.3.1
Loss of sensitive habitats and Priority Biodiversity Species on the Nenskra-Nakra Pass	DD	BIO-46	Additional precautions are to be taken on the Nenskra-Nakra Pass (KM15 to KM20. No access tracks, compounds or artificial lay-down areas, to be built above the tree line. Instead the use of pack animals, vehicles running low pressure tyres or helicopters to bring in structures would be used to minimise impacts on habitats.	Contractor	4.4.1
	DD	BIO-43	Plan the route to use as few towers as possible to span the Nenskra-Nakra Pass above the treeline section.	Contractor	4.4.1
Bird injury and mortality due to collision with overhead transmission lines	DD	BIO-42	Bird deflectors to be installed between KM 17 and KM 19, where the transmission line crosses the Nenskra Nakra Pass.	Contractor	4.4.1
	DD	BIO-44	Additional deflectors to be added to the base of towers and up to 5 m in height to increase the visibility to prevent/reduce the risk of collision by snowcock and grouse between KM 15 KM 20.	Contractor	4.4.1
	OP	BIO-45	Write and implement detailed post construction monitoring programme for Caucasian black grouse, Caspian snowcock and for raptors. The results would inform the need for additional bird deflectors, if required.	GSE	5.3.2
Disturbance to birds during lekking and breeding seasons	CO	BIO-47	Construction not to be undertaken during the lekking (first three weeks in May) and breeding season (May to July) in sensitive areas KM15 to KM21, unless preconstruction ornithology surveys (undertaken by the Biodiversity Clerk of Works), undertaken 1-2 weeks prior to works have found no signs of Caspian snowcock or	Contractor/GSE	4.4.1/5.3.1

			Caucasian black grouse within the Component corridor.		
Implementation of conservation measures in order to provide measures to offset biodiversity impacts of the Project	OP	BIO-48	Set up biodiversity data sharing agreement with stakeholders for protected areas (IBA, SPA, NP and candidate Emerald Site), for past and future biodiversity data relating to this Project for the Mestia Line	GSE	5.3.1
	OP	BIO-49	Agree funding cap, and work with BirdLife International, to write a Svaneti IBA target species management plan for Caucasian black grouse and Caspian snowcock.	GSE	5.3.1
Volume 3 Biodiversity – Transmission line – Component C2					
Loss of sensitive habitat	DD	BIO-50	During detailed design the Contractor would conduct biodiversity surveys of the line route through KM12 to KM26 of the Kheledula line, in order to locate the least impact locations for towers and access tracks and other infrastructure.	Contractor	4.5.2
	DD	BIO-52	Kheledula HPP line: Carryout detailed surveys in the area of conservation value (Figure 11 a to j in the Biodiversity Project Component Assessment (Document 3.3) KM12 – KM26 prior to construction using existing access track network and/or undertake surveys from air e.g., helicopters or drones.	Contractor	4.5.2
	DD	BIO-53	Kheledula HPP line: Detailed design in the area of conservation value KM12 – KM26 to maximise use of topography to minimise tower numbers eg tower placed on ridges so conductors can span forests without need for tree and vegetation removal	Contractor	4.5.2
	CO	BIO-54	Kheledula HPP line: Construction in the area of conservation value KM12 – KM26 to be undertaken using low impact forms of transport to minimise tree and vegetation removal eg using animals or helicopters instead of building new access tracks.	Contractor	4.5.2
Loss of Georgian Red List species	CO	BIO-51	Use Georgian Red List species such as sweet chestnut preferentially in the Revegetation Management Plan for restoration of track sides, borrow pits and other temporary construction working areas.	Contractor	4.5.3
Loss of trees in forests	CO	BIO-27	Forest loss to be compensated for through the implementation of a	GSE	5.3.1

			Reforestation Management Plan specific to each component, to ensure that no net loss of forest habitat occurs due to the Project.		
Loss of roosting habitat for bats	CO	BIO-55	Placing of 200 bat boxes on-route within the G7.1D habitats on the Lechkhumi line, KM24 to KM 34, or adjacent woodland.	Contractor/GSE	4.5.2/5.3.2
Bird injury and mortality due to collision with overhead transmission lines	CO	BIO-56	Install bird deflectors on the earth wire along the New Derchi Upper Namakhvani loop, to reduce collision risk adjacent to and within the Rioni Valley (Tvishi river gorge area).	Contractor	4.5.2
	CO	BIO-57	Install bird deflectors on the earth wire along both the New Derchi line and the Lechkhumi line between KM3 and KM10 on the Lechkhumi line and KM4 and KM10 on the New Derchi Line.	Contractor	4.5.2
	OP	BIO-58	Prepare and implement a bird collision monitoring programme for the New Derchi line and the Lechkhumi line between KM3 and 10 and the new Derchi Upper Namakhvani loop. If necessary additional flight deflectors would be installed to reduce any recorded collision risk.	GSE	5.3.1
Impact of human disturbance on nesting vultures	DD	BIO-59	Pre-construction survey to be undertaken by the Biodiversity Clerk of Works to ascertain if breeding Griffon or Egyptian vultures are located within 1km of construction related activity on the New Derchi Namakhvani loop.	GSE	5.2.1
	CO	BIO-60	If nesting is confirmed of Griffon and Egyptian vultures on the New Derchi Namakhvani loop, place restrictions on construction activity within 1km of nests during the vulture breeding season (March to mid-September).	Contractor	4.5.2
Volume 3 Biodiversity – Transmission line – Component D					
Loss of sensitive habitats	DD	BIO-61	Suitably qualified/experienced biodiversity expert to survey all areas within the proposed Gombori Emerald site, during the detailed design stage in order to locate the least impact locations for towers and access tracks and other infrastructure..	Contractor	4.6.3
	CO	BIO-62	BCoW to supervise the construction works in sensitive habitats passing through PBF and the Gombori proposed Emerald site so that	GSE	5.3.2

			micro-siting of works minimises and/or avoids the removal of red list species (Figure 11, Document 3.3, Volume 3 Biodiversity) for relevant transmission lines in Component D.		
Loss of Georgian Red List species	CO	BIO-63	Use of two Red List species (elm <i>Ulmus glabra</i> and walnut <i>Juglans regia</i>) for reinstatement where practicable in any temporary construction working areas where habitats are impacted or lost.	Contractor	4.6.4
Loss of trees	CO	BIO-27	Forest loss to be compensated for through the implementation of a Reforestation Management Plan specific to each component, to ensure that no net loss of forest habitat occurs due to the Project.	GSE	5.3.1
Bird injury and mortality due to collision with overhead transmission lines	CO	BIO-65	Installation of bird deflectors between KM 24 and KM 35	Contractor	4.6.3
Implementation of conservation measures in order to provide measures to offset biodiversity impacts of the Project	OP	BIO-66	Set up biodiversity data sharing agreement with stakeholders for the proposed Emerald site (Centre for Biodiversity Conservation and Research (NACRES)), for past and future biodiversity data relating to this project (Gurjaani and Akhmeta line).	GSE	5.3.2
	OP	BIO-67	Agree funding cap, and work with NACRES, to fund the undertaking of further baseline surveys and/ or writing of a defined number of conservation management plans, for the Gombori proposed Emerald Site.	GSE	5.3.2
Volume 4 Social – All transmission lines					
Land acquisition leading to physical and economic displacement	DD	SOC-3	Selection of non-used lands for siting of towers, and all temporary land needs, as much as possible.	Contractor	3.2.1 and 3.8.1
	DD	SOC-4	Selection of temporary construction sites such as lay-down areas inside the Right of Way (RoW), as much as possible.	Contractor	3.2.1
	DD	SOC-5	Reuse of existing paths and tracks for line access, as much as possible (common measure with Biodiversity Assessment , Volume 3).	Contractor	3.2.1
	DD	SOC-6	Consultation with local communities to select siting onsite towers,	Contractor	3.2.1 and

			access tracks and temporary land needs to avoid as much as possible impacts on productive lands as much as practicable.		3.8.1
	CO	SOC-9	The RoW clearance will be announced in advance to the affected land user to allow them to harvest any mature crops or salvage structures.	Contractor	3.8.1
Traffic impacts due to increased traffic flows, abnormal loads and construction works in vicinity of public roads	DD	SOC-13	Consult and work closely with traffic authorities and neighbouring communities, before construction, to establish a works calendar and determine the optimal timeline for such works, especially conductors' installation works	Contractor	3.9.1
	CO	SOC-14	During the conductors' installation and stringing phase, the Contractor will position dedicated workers to (i) block and/or control the traffic and (ii) notify drivers to proceed with caution.	Contractor	3.9.2
Community health and safety impacts during construction	CO	SOC-20	Engagement with aeronavigation authorities	GSE	5.4.1
	OP	SOC-28	In the event of complaints regarding micro-shocks, conducting objects (e.g. fences or other metallic structures) will be grounded where located near to the transmission lines.	GSE	5.7.1
	CO	SOC-29	Prevent access of the general public, by use of signs and barriers near the towers of the transmission line to prevent anyone from climbing towers (e.g. barbed wire barriers on towers).	Contractor	3.8.2
	OP	SOC-31	The Contractor(s) are contractually required to comply with ICNIRP guidelines with regards to EMF exposure	Contractors	3.2.1
Direct and indirect impacts on identified cultural heritage	DD	SOC-38	The siting of the towers will be designed to avoid the identified cultural heritage elements.	Contractor	3.2.1
	DD	SOC-39	Where feasible, towers will be located at least 300m away from any known cultural heritage element registered by National Agency for Cultural Heritage Preservation of Georgia (NACHP) as an immovable monument of cultural heritage.	Contractor	3.2.1
	DD	SOC-40	Where feasible, towers will be located at least 500m away from any known cultural heritage element registered by NACHP as an	Contractor	3.2.1

			immovable monument of cultural heritage of national significance.		
Volume 4 Social – Transmission line – Component A					
Access to summer grazing rights	CO	SOC 1-1	Consultation with local herders in advance of construction to identify and map current and alternative pasturing routes. The construction activities will be organized to ensure pasturing routes are not disrupted, or if this is not possible, to minimise any disruption.	GSE / Contractor	4.2.5
Land acquisition of areas with summer grazing rights and customs leading to physical and economic displacement	DD	SOC-1-2	The Resettlement Action Plan (RAP) for the Sairme Line will take into account the summer grazing rights and customs and define livelihood restoration measures as appropriate.	GSE	5.7.1
Impacts on railway usage and safety where the Sairme line crosses at KM 2 and between KM 10 and KM11	DD	SOC-1-3	GSE will engage the railway authority and schedule the work to minimise rail traffic interruption.	GSE	5.6.1
Impacts due to landslides.	DD	SOC-1-4	Following geotechnical studies, further detailed geohazard investigations would be undertaken where the risks of landslide are considered to be present in the municipalities of Adigeni and Akhaltsikhe.	Contractor	4.2.3
	DD	SOC-1-5	Consultation with the neighbouring communities in the municipalities of Adigeni and Akhaltsikhe would be carried out to explain the results of these studies, demonstrating the measures to mitigate geohazards risks.	Contractor	4.2.3
Cumulative land acquisition leading to physical and economic displacement	DD	SOC-1-6	Coordination and harmonisation between GSE projects (Tskaltubo Substation, the Jvari-Tskaltubo 500kV line, and the Akhaltsikhe – Batumi line) with regard to potential cumulative impacts on the livelihoods of households by the land acquisition processes.	Contractor/GSE	4.2.5 and 5.5.1
Cumulative community health and safety impacts relating to concurrent construction works	CO	SOC-1-7	In the case of concurrent construction periods between GSE projects, GSE will require the Construction Contractors to coordinate to ensure effective management of community health and safety.	Contractor	4.2.6

with the	CO	SOC-1-8	Measure to protect communities from risks of accident will be applied consistently across all projects.	Contractor	4.2.6
	CO	SOC-1-9	Require the Construction Contractors to coordinate with Contractors on other GSE projects to harmonize projects' traffic management.	Contractor	4.2.7
Volume 4 Social – Transmission line – Component B					
Land acquisition of areas with informal use of forests and State land in the highlands of Chokhatauri leading to physical and economic displacement	DD	SOC-2-1	The RAP for the Guria line will take into account the informal use of forest and State land by the affected people and define livelihood restoration measures if necessary.	GSE	5.5.1
Cumulative community health and safety impacts relating to concurrent construction works with the Zoti HPP.	DD	SOC-2-3	In the case of concurrent construction periods between Zoti HPP and the GSE Project, coordination between the projects to ensure effective management of community health and safety	Contractor	4.3.2
Volume 4 Social – Transmission line – Component C1					
Access to summer grazing rights	CO	SOC 3-1	Consultation with local herders in advance of construction to identify and map current and alternative pasturing routes. The construction activities will be organized to ensure pasturing routes are not disrupted, or if this is not possible, to minimise any disruption.	GSE / Contractor	4.2.5
Land acquisition of areas with collective customary right of use of summer pasture leading to physical and economic displacement	DD	SOC-3-1	The RAP for the Mestia line will take into account collective customary right of use of summer pasture areas and define individual and/or collective livelihood restoration measures as appropriate.	GSE	5.5.1
Impact on aircraft navigation safety – Mestia Airport	DD	SOC-3-2	Engagement with Aeronavigation authorities regarding the proximity to Mestia Airport	GSE	5.4.1
Impacts of geohazards on communities and in particular	DD	SOC-3-4	Detailed geohazard studies in areas prone to landslides in Chuberi and Nakra communities.	Contractor	4.4.3

the Chuberi and Nakra communities	DD	SOC-3-4	Consultation with the communities to explain the results of these studies and the mitigation of potential geohazards risks in Chuberi and Nakra communities, and in all the communities crossed by the transmission line in the Mestia Municipality.	Contractor	4.4.3
Cumulative land acquisition leading to physical and economic displacement	DD	SOC-3-6	Coordination and harmonisation as and when appropriate between GSE and Nenskra and Mestiachala HPPs with regard to potential cumulative impacts on the livelihoods of households by the land acquisition processes.	GSE/Contractor	5.5.1 and 4.4.4
Cumulative community health and safety impacts relating to concurrent construction works with the Nenskra, Mestiachala and Khudoni HPPs.	CO	SOC-3-7	In the case of concurrent construction periods with neighbouring projects, the Construction Contractors shall coordinate with HPP developers to ensure effective management of community health and safety.	Contractor	4.4.5
	CO	SOC-3-8	Measures to protect communities from risks of accident will be applied consistently across all projects.	Contractor	4.4.5
	CO	SOC-3-9	Require the Construction Contractors to coordinate with Nenskra HPP developers to harmonize projects' traffic management.	Contractor	4.4.6
Volume 4 Social – Transmission line – Component C2					
Impact on aircraft navigation safety – Ambrolauri Airport	DD	SOC-4-2	Engagement with Aeronavigation authorities regarding the proximity to Ambrolauri Airport.	GSE	5.4.1
Cumulative land acquisition leading to physical and economic displacement	DD	SOC-4-3	Coordination and harmonisation as and when appropriate between GSE and Namakhvani, Oni, and Kheledula HPPs with regard to potential cumulative impacts on the livelihoods of households by the land acquisition processes.	GSE/Contractor	5.5.1 and 4.5.5
Cumulative community health and safety impacts relating to concurrent construction works with the Namakhvani, Oni, and Kheledula HPPs.	CO	SOC-4-4	In the case of concurrent construction periods with neighbouring projects, GSE will require the Contractor to coordinate with HPP developers to ensure effective management of community health and safety.	Contractor	4.5.5
	CO	SOC-4-5	Coordinate with HPP developers so that measures to protect communities from risks of accident can be applied consistently across all projects, as far as possible.	Contractor	4.5.5

	CO	SOC-4-6	Contractor will to coordinate with HPP developers to harmonise traffic management as far as possible.	Contractor	4.5.6
Volume 4 Social – Transmission line – Component D					
Land acquisition leading to physical and economic displacement	DD	SOC-5-1	Reuse as far as is practicable, the existing tower locations which are to be dismantled.	Contractor	4.6.2
	CO	SOC-5-2	Avoid cutting or damaging the trees of the Forest planted as a World War II memorial (KM13 Gurjaani Line) during construction, as much as possible.	Contractor	4.6.2
	CO	SOC-5-3	Minimise damage to productive commercial vineyards using lower impact methods (e.g., manual methods, use of pack animals, helicopters) of construction and dismantling of existing towers	Contractor	4.6.1
Impact on aircraft navigation safety – Telavi Airfield	DD	SOC-5-5	Engagement with Aeronavigation authorities regarding the proximity with to Telavi Airfield.	GSE	5.4.1
Volume 5 Physical Environment – All transmission lines					
Increase in landscape and visual impact due to changes to Project during detail design	DD	L&V-1	Adherence to design principles during refinement of the transmission line routes.	Contractor	3.2.1
	DD	L&V-2	Inclusion of the landscape and visual design principles in a management of change process for the environmental assessment of new transmission line routing proposed to be located outside the assessment corridor of this study	Contractor	3.2.1
Increase in noise impact due to changes to Project during detail design	DD	NOI-3	Maximise the distance to housing during detailed design of the transmission line routes.	Contractor	3.2.1
Operational noise due to transmission lines	CO	NOI-4	Quality assurance through manufacturing and transportation to avoid damage to transmission line conductors.	Contractor	3.10.1
	CO	NOI-5	Maintain conductors clean and free of surface contaminants during stringing.	Contractor	3.10.1
Increase in hydrology, geology	DD	HYD-1	Adherence to design principles for refinement of the transmission	Contractor	3.2.1

and natural hazard impacts due to changes to Project during detail design	DD	HYD-2	line routes to avoid high risk hydrology and geohazard areas. Implementation of a management of change process for the environmental assessment of new transmission line routing proposed to be located outside the assessment corridor of this study.	Contractor	3.3.1
Impacts due to herbicides to clear RoW	CO	HYD-8	Use of mechanical clearing techniques only for the removal of tree and vegetation. Herbicides are not to be used for the removal of trees and vegetation.	Contractor/GSE	3.4.3 and 5.2.1
Disturbance of contaminated land impacting the water environment or causing a health risk to construction workers	DD	HYD-9	A desk study to identify, characterise, and assess the potential for disturbance of contaminated land in former industrial areas. Also the subsequent identification and implementation of appropriate mitigation measures if contamination is suspected and confirmed by site investigation.	Contractor	3.6.1
	DD	HYD-10	Development and implementation of a protocol for dealing with any unexpected contamination identified during construction to ensure that its immediate effect is minimised and that appropriate mitigation is undertaken.	Contractor	3.6.1
Geohazard impacts	DD	HYD-11	Use of geohazard studies and specific slope-erosion and slope-stability studies to inform detailed design.	Contractor	3.2.1
Volume 5 Physical Environment – Transmission line – Component A					
Increased impact on landscape and visual receptors of Borjomi-Kharagauli National Park	DD	L&V-9	During detailed design, the distance between the Sairme line and the Borjomi-Kharagauli National Park should not be reduced.	Contractor	4.2.1
Impact on remote landscapes between KM55 and KM59	CO	L&V-10	Construction works through the central part of the Sairme line (KM55-KM59) should not include the construction of access tracks, borrow pits, or construction compounds. This landscape should be protected as much as possible by using low impact methods of construction which are limited to tower locations and the clearance corridor for the stringing of the line only	Contractor	4.2.1
Contaminated land impacts	DD	HYD-12	A risk assessment and site investigation ahead of any site works	Contractor	4.2.4

			would be undertaken along the route of the Sairme line in former industrial areas of Kutaisi and Tskaltubo between KM0 and KM3.		
Landslip and erosion impacts	DD	HYD-13	All construction works to avoid the unstable slopes of the deep ravine adjacent to the Akhaltsikhe Substation between KM0 and KM1.	Contractor	4.2.3
Volume 5 Physical Environment – Transmission line – Component B					
Impact on the recreational receptors at Bakhmaro		L&V-11	During detailed design, should the alignment of the Guria line alter in the vicinity of Bakhmaro this should be evaluated carefully to ensure the local landform and woodland cover are used to maximise the screening of the transmission line	Contractor	4.3.1
Volume 5 Physical Environment – Transmission line – Component C1					
Impact on the landscape of the Nakra Pass.	CO	L&V-13	Construction works through the Nakra Pass on the Mestia line (KM15-KM20) should not include the construction of access tracks, borrow pits, or construction compounds. This landscape should be protected as much as possible by using low impact methods of construction which are limited to tower locations only	Contractor	4.4.1
Volume 5 Physical Environment – Transmission line – Component D					
Landscape and visual impacts of underground cable	CO	L&V-16	Reinstatement of vegetation and soils complementing surrounding landscapes must be undertaken to ensure that the underground cable corridor is successfully restored and integrated following construction.	Contractor	4.6.4
Landscape and visual impacts of cable sealing end compounds	DD	L&V-17	Consideration of design principles, such as the selection of materials and finishes, during detailed design of the cable sealing end compounds.	Contractor	3.2.1
	CO	L&V-18	Reinstatement of vegetation and soils complementing surrounding landscapes must be undertaken to ensure that the cable sealing end compounds fit in to its surrounding landscape.	Contractor	4.6.4

3.0 Project-wide Measures under the Responsibility of the Transmission Line Contractor

3.1 Introduction

This section outlines the **general** measures that must be adopted by all **transmission line contractors**. In conjunction with the obligations defined under the Contract, the Contractor will plan, execute and document construction works pursuant to the Environment, Social, Health and Safety (ESHS) specifications set out in this Section 3 and Section 4 of this document.

The Contractor must also plan, execute and document construction works pursuant to the ESHS specifications set out in Section 5 of the **Project-wide ESMP (Document 8.1, Volume 8)**.

3.2 Detailed Design of Transmission Lines and Associated Temporary Infrastructure

Those criteria that apply to the detailed design of the transmission lines and their associated construction infrastructure throughout the Project are set out in Section 3.2.1.

3.2.1 Planning Requirement

General requirements

- [TLCC-1] The final detailed design shall be submitted to the Implementation Consultant and GSE for approval prior to construction starting. The Contractor shall document how the criteria set out in this specification have been met to the satisfaction of GSE/Implementation Consultant.
- [TLCC-2] The Contractor will design the transmission line as close as possible to the routes set out in the feasibility studies and make every effort to keep the route within the ESIA corridor, which is a corridor 250m either side of the feasibility study transmission line route centre line and avoiding any sensitive areas as identified in Figure 11a-j **Biodiversity Project Component Assessment** (Document 3.3).
- [TLCC-3] Where the detailed design of the transmission line route is to be located outside of the ESIA corridor, the contractor must apply the specifications outlined in Section 3.3 (Management of Change Procedure) of this document.
- [TLCC-4] The detailed design shall include the location of working areas to be used during the construction works, including Workers' Accommodation, compounds and laydown areas and any other working sites, including borrow pits.

Transmission line detailed design

- [TLCC-5] The Contractor shall adopt the following design criteria with respect to tower locations, transmission line routing and design of cable sealing end compounds:
 - Locate on non-productive land as much as possible. The Contractor shall consult local communities to identify non-used land and avoid productive land as much as possible;
 - Avoid displacement of persons and to be located as far as practicable from housing.
 - Avoidance of tower placement within wetlands, rivers, or areas of biodiversity sensitivity (Figure 11a-j, **Biodiversity Project Component Assessment**, Document 3.3);
 - Minimise tree and vegetation removal with the right of way corridor (refer to specifications set out in Section 3.4);

- Minimise nuisances to community due to noise, vibration, light, dust or obstruction to local traffic;
- Avoiding placing towers on visible prominent ridges.
- Avoidance of barren slopes or areas showing signs of instability or erosion;
- Minimise hydrology, geology and natural hazard impacts;
- Compliance with Georgian, WHO, IFC/World Bank EHS Guidelines with respect to construction and operational noise;
- Compliance with ICNIRP guidelines with respect to EMF;
- Avoidance of siting towers on identified cultural heritage elements;
- Where feasible, locate towers at least 300m way from any known cultural heritage element registered by NACHP as an immovable monument of cultural heritage; and
- Where feasible, locate towers at least 500m away from any known cultural heritage element registered by NACHP as an immovable monument of cultural heritage of national significance.
- [TLCC-6] The design of cable sealing end compounds must consider the above design principles and also:
 - Use of screening provided by local features such as landform and vegetation;
 - Materials selection should contribute to a reduction in the level of landscape and visual impacts. Recessive colours and non-reflective materials (including fencing) should be used where practicable.
- [TLCC-7] Construction infrastructure (eg tower laydown areas, access tracks, borrow pits) is to be located within the Right of Way as much as possible, unless there is a good environmental and social reason for them not to be and with the approval of the Implementation Consultant. The Contractor shall demonstrate that the location of construction infrastructure and working areas is located outside the most sensitive areas, as defined by the ESIA and shown in Figures 11a-j **Biodiversity Project Component Assessment** (Document 3.3) and that it meets the requirements of Section 5.3.1 of the **Project-wide ESMP** (Document 8.1).

Access tracks

- [TLCC-8] Details of new and existing access tracks, meeting the specification set out in this Section 3.2, are to be mapped and set out in an Access Track Management Plan and provided to GSE/Implementation Consultant for approval prior to construction starting.
- [TLCC-9] Existing paths and access tracks should be re-used as much as possible and lengths of new access tracks should be minimised.
- [TLCC-10] New access tracks should avoid sensitive areas, where practicable, including:
 - Key sensitive landscapes;
 - Wetlands, rivers, or areas of biodiversity value;
 - Prominent ridges, unless the use of a ridge permits the avoidance of sensitive habitats.
 - Barren slopes or areas showing signs of instability or erosion
 - On identified cultural heritage elements;
- [TLCC-11] Access tracks in forests should be designed as follows:

- Only the required tree and vegetation cutting necessary for the construction of the track is permitted.
 - Access tracks are not cut in valleys or ravines where the overhead lines pass;
 - Where possible access tracks are routed around trees and forests;
 - Access tracks follow the right of way where trees are required to be removed;
 - Access tracks should be kept to areas that have previously been affected by logging or other activities; and
 - Access tracks are not built on slopes above 12% in steepness.
- [TLCC-12] If new tracks are required, then biodiversity surveys will be undertaken and the least impacting practical route taken;
 - [TLCC-13] Where new tracks are required within areas designated as a Priority Biodiversity Feature (Figure 11a-j **Biodiversity Project Component Assessment**, Document 3.3), then the use of special equipment or a helicopter will be required to minimise the footprint impacts of access tracks. This has been detailed separately in the specific sections of this Project Component assessment.
 - [TLCC-14] Specifications for access tracks on a Project Component basis set out in Section 4 of this document also apply where relevant.

3.3 Management of Change Procedure (MCP)

As described in Section 2.4 of the **Project-wide ESMP** (Document 8.1), the MCP will be implemented for any changes to design of the **transmission lines** which occurs outside of the ESIA assessment area as defined in section 1.4.3 of **Volume 2 Project Definition**. This procedure is also to be applied for associated construction infrastructure not previously defined in the Feasibility Studies which is to be located outside of the ESIA assessment corridors defined in the ESIA Report. The measures to be considered for **transmission lines** are set out herewith.

3.3.1 Planning Requirements

Identification and consideration of design changes

- [TLCC-15] Design changes proposed by the Contractor that would result in proposed development beyond the ESIA assessment corridors shall be notified to GSE/Implementation Consultant.
- [TLCC-16] Design changes must respect the criteria set out with respect to detailed design (section 3.2). The following criteria must also be adopted:
 - Avoidance of all designated areas (unless already routed within one);
 - Avoidance of key sensitive landscapes;
 - Keeping transmission lines to already impacted landscapes in preference of untouched landscapes, particularly untouched forest areas; and
 - Avoidance of high-altitude areas and inaccessible areas.

Notification of Design Change and Screening by Contractor

- [TLCC-17] The Contractor will develop a screening tool (to be agreed with GSE/Implementation Consultant prior to any changes being brought forward) to provide a preliminary opinion to GSE/Implementation Contractor of the category of design changes, as per the categories defined in section 2.4 of the **Project-wide ESMP** (Document 8.1).
- [TLCC-18] The contractor must demonstrate that it has considered alternative designs prior to the notification of the proposed design change.

Environmental and Social Studies for Category 2 and 3

- [TLCC-19] Where appropriate and as instructed by GSE/Implementation Consultant, the Contractor undertakes to produce the E&S study 'scope of works' for Category 2 and 3 design changes. The scope of works shall be proportional to the design change's category (2 or 3) and the nature, size, location, proximity to sensitive areas, as well as the extent and likelihood of potential impacts and risks. The scope of works shall be submitted to GSE/Implementation Consultant for approval.
- [TLCC-20] Where appropriate and particularly for Category 3 E&S studies, an assessment of alternatives shall be included. A stakeholder strategy and plans for public disclosure shall also be proposed for all Category 3 design changes.
- [TLCC-21] The Contractor shall adopt the mitigation hierarchy approach to address adverse environmental or social impacts and issues to workers, affected communities, and the environment due to design changes. The mitigation hierarchy comprises measures taken to avoid creating environmental or social impacts from the outset of development activities, and where this is not possible, to implement additional measures that would minimise, mitigate and, as a last resort, offset and/or compensate any potential residual adverse impacts.
- [TLCC-23] All E&S studies shall be undertaken in accordance with the methods used in the 2019 ESIA and be compliant with Lender's policies, Georgian legislation and GIP.
- [TLCC-24] Where relevant, E&S studies shall be supported by relevant site-specific investigations to establish the baseline on ecosystems and protected species, as well as the baseline on land ownership and land use of areas affected by the project and associated facilities. An avian risk assessment and biodiversity surveys, to identify habitats and protected species, potentially affected by the design changes shall also be carried out, unless otherwise agreed with the Implementation Consultant.
- [TLCC-25] The biodiversity surveys must be done to the EUNIS level, to a scale of 50 metres, or less

where appropriate. For each habitat type a list of species and abundance shall be made. This type of survey must be undertaken by a suitably qualified botanist employed by the Contractor.

- [TLCC-26] The E&S Study shall be submitted to GSE/Implementation Consultant for approval. All Category 3 design changes shall be reviewed by the Project Lender's.
- [TLCC-27] Where requested, the Contractor shall make corrective changes to the E&S study as directed by GSE/Implementation Consultant.
- [TLCC-28] Where the need has been identified during the definition of the E&S study scope of works, the contractor shall undertake stakeholder consultation and also prepare the appropriate documents needed for public disclosure. The Contractor shall work with GSE/Implementation through the public disclosure process.

Addenda to ESMP

- [TLCC-29] If an approved design change requires environmental and social measures which are not covered by the present ESMP, the Contractor shall prepare an addendum to the ESMP to address specific mitigation measures or management plans. The addenda shall be submitted to GSE/Implementation Consultant and the Lender's (for Category 3 changes) and disclosed on the Project website.

Addenda to Resettlement Action Plans

- [TLCC-30] For each approved design change, the Contractor shall provide to GSE/Implementation Consultant details of the land required by the proposed change in design.

3.4 Tree and Vegetation Removal in the Transmission Line Right of Way

In addition to the tree and vegetation removal specification set out in Section 5.3.2 of the **Project-wide ESMP** (Document 8.1), there are specific requirements with regards to the minimisation of tree and vegetation removal that must be followed for the creation of the right of way through forests or other areas where there are trees and vegetation present.

There can be significant adverse effects arising from tree removal if this goes beyond the minimum necessary or is completed in an appropriate manner. Tree removal must be designed to:

- meet required electrical safety clearances for operation;
- avoid risk of operational failure caused by falling trees where the operating line is the only way of transmitting electricity on the network to meet operational requirements;
- future vegetation maintenance activities are not unduly time consuming;
- minimise short-term effects on ecological (habitat and species) resources and supports their longer term recovery;
- minimise the potential for sediment laded runoff to watercourses / waterbodies and minimise the potential for soil erosion;
- support ongoing and future productive uses of the land (for crops and livestock) that can be safely retained under transmission line routes; and
- reduce the landscape and visual impacts of the construction work.

3.4.1 Transmission Line Clearance Requirements

Table 3.1 sets out transmission line clearances from conductors as specified by the Georgian Decree 366.

TABLE 3.1 TRANSMISSION LINE CLEARANCE REQUIREMENTS

Transmission line voltage	Ground cover	Vegetation and Tree Clearance Requirements
		Clearance Next to outer conductor line (horizontal distance)
500kV - Sairme line - Kavkasioni loop - Lechkhumi line	Vegetation ¹	Vegetation less than 4m = no cutting
	Trees ²	Gardens of fruit trees = no mandatory clearance Tree height (forests ³) if trees >4m Trees outside forest ⁴ = 5m from maximum conductor swing
400kV - Tao line	Vegetation	Vegetation less than 4m = no cutting
	Trees	Gardens of fruit trees = no mandatory clearance Tree height (forests ⁵) if trees >4m Trees outside forest ⁶ = 5m from maximum conductor swing
220kV and 110kV (representing the only source of power for consumers) - Gurjaani line - Akhmeta line - Tsinandali line	Vegetation	Vegetation less than 4m = no cutting
	Trees	Gardens of fruit trees = no mandatory clearance Tree height (forests ⁷) if trees >4m

¹ Vegetation – any ground cover such as grass or bushes which comprise a perennial woody plant with a branched crown formed from the surface of the ground and which does not reach more than 3m in height.

² Tree – a perennial woody plant which develops a main stem or, in case of coppice tree – several branches, and forms a branched crown, and reaches a minimum of 3m height in maturity.

³ Forest – land plot with a width of not less than 10m and area of not less than 0.5 hectare covered with one or more forest timber species where the canopy cover makes not less than 20% of this land plot.

⁴ Definition of trees outside ‘forests’ comprise gardens, municipal green zones and parks; rows of trees with the function of preventing soil erosion (e.g. windbreaks); territories which are not located in forest and are used for short term rotation for up to thirty years starting from the time when forest forming timber species are planted; arboretums of forest species and New Year tree plantations; plantations of timber tree species used for producing walnuts, hazelnuts, chestnut, also fruit/ berry species.

⁵ Forest – land plot with a width of not less than 10m and area of not less than 0.5 hectare covered with one or more forest timber species where the canopy cover makes not less than 20% of this land plot.

⁶ Definition of trees outside ‘forests’ comprise gardens, municipal green zones and parks; rows of trees with the function of preventing soil erosion (e.g. windbreaks); territories which are not located in forest and are used for short term rotation for up to thirty years starting from the time when forest forming timber species are planted; arboretums of forest species and New Year tree plantations; plantations of timber tree species used for producing walnuts, hazelnuts, chestnut, also fruit/ berry species.

⁷ Forest – land plot with a width of not less than 10m and area of not less than 0.5 hectare covered with one or more forest timber species where the canopy cover makes not less than 20% of this land plot.

Transmission line voltage	Ground cover	Vegetation and Tree Clearance Requirements
- Mukuzani line		Trees outside forest ⁸ = 4m for 220kV or 3m for 110kV from maximum conductor swing
220kV - Paliastomi loop - Kheledula HPP line - Oni HPP line - New Derchi line - Lajanuri HPP line	Vegetation	Vegetation less than 4m = no cutting
	Trees	4m from maximum conductor swing In slopes and ravines where the minimum clearance from the top of the lowest conductor is 8m = 2m on lower slope and 4m on upper slope
110kV - Guria line - Mestia line	Vegetation	Vegetation less than 4m = no cutting
	Trees	3m from maximum conductor swing In slopes and ravines where the minimum clearance from the top of the lowest conductor is 8m = 2m on lower slope and 3m on upper slope

3.4.2 Planning Requirements

Vegetation and Tree Removal Planning

- [TLCC-31] The Contractor must prepare a Vegetation and Tree Clearance Plan for the right of way corridor to be submitted to and approved by the Implementation Consultant. The Plan must provide a map/s (with a minimum scale of 1/10,000) of the trees and forested areas identified from the above showing the following:
 - Areas defined as ‘Forests’ and ‘tree belts and preserved areas’
 - Orchards where no forest corridor required;
 - Riparian habitats where retention is required where practicable;
 - Trees where pruning required;
 - Areas for vegetation and tree removal clearly showing the application of the relevant tree clearance separation distances applied as per Table 3.1 of this document.
- [TLCC-32] The plan should also cover proposals for access track construction and the Contractor must demonstrate that they have taken every effort to minimise tree and vegetation removal for access tracks such that they have:

⁸ Definition of trees outside ‘forests’ comprise gardens, municipal green zones and parks; rows of trees with the function of preventing soil erosion (e.g. windbreaks); territories which are not located in forest and are used for short term rotation for up to thirty years starting from the time when forest forming timber species are planted; arboretums of forest species and New Year tree plantations; plantations of timber tree species used for producing walnuts, hazelnuts, chestnut, also fruit/ berry species.

- Maximised the use of existing tracks;
- Minimised the length of access tracks; and
- Kept access tracks to areas that have previously been affected by logging or other activities.
- [TLCC-33] No tree or vegetation removal can commence until the plan has been submitted and approved. The Plan must demonstrate the following approach has been adopted for tree and vegetation removal and height reduction:
- [TLCC-34] Mechanical clearing techniques only shall be used. Herbicides are not to be used for the removal of trees and vegetation.
- [TLCC-35] Detailed routing - All other effects being equal, the Contractor must demonstrate that potential effects on afforested areas have been minimised during detailed design route selection by seeking to avoid small areas or lines of trees / forest where diversion is possible within agreed corridors;
- [TLCC-36] Detailed alignment and tower positioning - All other things being equal (e.g. without increased visual or other effects) demonstrate that the requirement for tree removal during detailed design and tower spotting has been minimised by use of the following methods:
 - Use of existing natural or man-made cleared corridors (e.g. access tracks, fire breaks or areas of lower vegetation);
 - Tower positioning makes use of localised high points to achieve enhanced clearance above ground level vegetation to avoid its removal. This is of particular relevance in ravines / gorges or more mountainous areas.
 - On side slopes seek to align to the uphill side of the treeline if possible within agreed corridors
- [TLCC-38] Define the Forest Corridor area using the approach outlined in Table 3.1.
 - Establish width between outermost conductors for tower type selected;
 - Establish vegetation clearance (eg shrubs, ground cover) either side of the transmission line outermost conductor as per horizontal clearances specified in Table 3.1 of this document;
 - For 220kV and 110kV towers, where the power supply is not the only supply to consumers, which are located on steep slopes or ravines, the horizontal clearance corridor is given to be 2m on the lower slope where the vertical clearance to the lowest conductor is more than 8m. The horizontal clearance on the upper slope is to be based on figures quoted in Table 3.1.
- [TLCC-39] The Contractor should also take into account:
 - Identify trees of a species that will grow into the Forest Corridor before next routine maintenance visit cycle (based on 5 year maintenance cycle) and identify for potential removal, all other trees to remain in situ;
 - Where the tree height is to be applied as per Table 3.1 of this document, establish general canopy height on each side of the centreline. In most cases this will be the same on either side but local variations may exist. Canopy height is the height that creates the skyline if able to view the forest from alongside;
 - Identify additional Tall trees (taller than the general canopy) to potentially be removed where there is a risk/danger of them falling over onto the conductor lines. Where this exists, height reduction by pruning should be the preferred approach where only a small shortfall in separation occurs and where this can be achieved safely; and
- [TLCC-40] The corridor for the pilot wire is to be minimised and the width and method of installation is

to be agreed with the Implementation Consultant. The following principles apply:

- Tree and vegetation removal should be avoided where possible by passing the pilot wire around or above trees and vegetation;
- Low impact methods of transport should be chosen such as small 4-wheel drive vehicles or use of animals;
- If trees and vegetation must be cut in order to install the pilot wire and create tension for conductor line pulling then the pilot wire corridor is to be no wider than 5m.

3.4.3 Management Actions

Vegetation and Tree Removal Methods

- [TLCC-41] The Contractor defines working methods of tree removal and other relevant construction controls to minimise impacts on forests, trees and vegetation for prior approval by the Implementation Consultant, to include the principles outlined in section 5.3.3 Management Action of the **Project-wide ESMP**.
- [TLCC-42] The Contractor describes in the CESMP the planned methods and schedule for vegetation clearing. Specific agreement from the Implementation Consultant is obtained prior to any clearing works.
- [TLCC-43] Supervisors shall be trained in the controlled felling of trees to prevent impacts beyond worksites. They shall also be trained on the importance of identification and preservation of wild fauna encountered and disturbed during the stripping operation.
- [TLCC-44] Riparian woodland habitats should be retained where practicable;
- [TLCC-45] As much ground cover is to be retained as possible, in particular shrubs and small trees;
- [TLCC-46] Where possible, cutting of vegetation on steep hillsides with significant conductor line clearance will be minimal.

3.5 Biodiversity

The specifications outlined in this section are to be read in conjunction with Section 5.3.3 of the **Project-wide ESMP** and any Project Component specifications outlined in Section 4 of this **Transmission line ESMP**.

3.5.1 Management Actions

Habitat conservation

- [TLCC-47] The Contractor shall implement the following measures in the right of way with respect to promoting habitat biodiversity:
 - For vegetation and woody material (slash) which has no saleable value, including unsaleable wood (eg rotten trees), this must remain on site in the felled right of way for the purposes of offering refuge to wildlife and for the propagation and reinstatement of vegetation.
 - At approximately 1km intervals within the transmission right of way where there has been tree removal, two piles of 5 cut tree trunks (salvageable or unsalvageable) to be left on-site to provide a wildlife refuge for species such as birds, bats and insects.
 - At approximately 200m intervals within the transmission line right of way where there has been tree removal, 1 stripped uncut tree trunks to be kept in-situ, whilst respecting vertical clearances to provide a wildlife refuge for species such as birds, bats and insects. Deadwood and hardwood species such as beech and hornbeam to be prioritised
 - Within underground cable corridors and at cable sealing end compounds, vegetation and soils must be reinstated to complement the surrounding landscapes to ensure they are successfully restored and integrated following construction.

Avian Ecology

- [TLCC-48] The Contractor shall fit to the earth wire of all transmission lines with bird deflectors, where they pass over watercourses which are 5m wide or more. The bird deflectors shall be:
 - line markers should be as large as possible, and increase the visible thickness of the line by at least 20 cm, for a length of at least 10-20 cm;
 - spacing of devices should be not more than 5-10 m apart;
 - line markers should incorporate as much contrast with relevant backgrounds as possible;
 - colour is less important than achieving the contrast to the background;
 - markers should protrude vertically both above and below the conductor;
 - deflectors shall be visible at night (through illumination, phosphorescence, ultraviolet radiation and other means).
- [TLCC-49] Specifications for bird deflectors set out in Section 4 of this document also apply where relevant.

3.6 Soil Management

The specifications outlined in this section are to be read in conjunction with Section 5.3.6 of the **Project-wide ESMP** and any Project Component specifications outlined in Section 4 of this **Transmission line ESMP**.

3.6.1 Planning Requirements

Soil Contamination

- [TLCC-50] The Contractor shall undertake a desk study to identify, characterise, and assess historic land use and the potential for disturbance of contaminated land in former industrial areas. Specifications

set out in Section 4 also apply where historical contamination is anticipated in certain Project Component locations. The Contractor shall provide a report to GSE/Implementation Consultant highlighting the contamination risk along the transmission line route.

- [TLCC-51] The Contractor shall undertake intrusive ground investigation prior to any construction commencing at locations where the desk studies indicate historic land use may have resulted in a potential for contamination that may require occupational health and safety measures and environmental controls. A working scheme of investigation for the site investigation proposed at each location shall be agreed with GSE/Implementation Consultant in advance of the site investigation works commencing at each location.
- [TLCC-52] The ground investigations shall include laboratory analysis of soil and water, together with ground gas monitoring. Contamination is deemed to be present where compounds are found at a concentration that is greater than the limit values recognised for that compound according to Georgian standards or, in the absence of these, other sources of risk-based standards or guidelines to obtain comprehensive criteria for screening soil concentrations of pollutants, whichever is the strictest. If no recognised threshold exists, the Contractor will provide proof that the compounds found are harmless to human health and the environment.
- [TLCC-53] If contamination is found to be present a risk assessment is undertaken and the implementation of GIP measures to ensure that the development does not present an unacceptable risk to human health or the environment. Depending on the specific ground conditions, these may include: dust control, asbestos control, the specification of additional personal protective equipment (PPE) for use by construction workers, treatment or safe disposal of soils to a licenced facility, the use of chemical-resistant concrete for foundations and other below-ground elements, and ground gas protection.
- [TLCC-54] The Contractor shall develop and implement a protocol for dealing with any unexpected contamination identified during construction to ensure that its immediate effect is minimised and that appropriate mitigation is undertaken.

3.7 Damage to Property

The specifications outlined in this section are to be read in conjunction with Section 5.4.6 of the **Project-wide ESMP** and any Project Component specifications outlined in Section 4 of this **Transmission line ESMP**.

3.7.1 Planning Requirements

Procedure for land entry

- [TLCC-55] The Contractor shall develop a procedure for the negotiation of entering private land needed for the purposes of site investigation prior to the finalisation of the detailed design and definition of the final tower and other Project infrastructure components. The procedure is to be submitted and approved by GSE/Implementation Consultant prior to any negotiation with private landowners. The procedure must set out the following:
 - Compensation framework (based on the **LARCF** Volume 7 of the ESIA) which is to be agreed with the land owner;
 - Details of prior warning to be given to private landowners;
 - Site entry protocol;
 - Workers Code of Conduct; and
 - Details of site reinstatement.

3.7.2 Management Actions

Land entry

- [TLCC-56] The Contractor shall implement the approved procedure for the entry of private lands.
- [TLCC-57] The Contractor shall pay the agreed amount of compensation (based on the framework set out in the **LARCF** Volume 7 of the ESIA) to the landowner before entering the site.
- [TLCC-58] The Contractor reinstates all sites to an accepted quality and as agreed with the landowner.

Grievance Management

- [TLCC-59] The Contractor shall strictly follow the Community Grievance Procedure set out in the Project **Stakeholder Engagement Plan** (ESIA Volume 6) for any instances where the landowner raises a grievance relating to the land entry described in this specification.

3.8 Community Interaction

The specifications outlined in this section are to be read in conjunction with Section 5.4.5 of the **Project-wide ESMP** and any Project Component specifications outlined in Section 4 of this **Transmission line ESMP**.

3.8.1 Planning Requirement

- [TLCC-60] The Contractor will consult local communities in order to identify those areas that comprise productive land and those that are non-used in order to inform detailed design of transmission line and construction infrastructure locations. This consultation should also request the location of areas of forest that have been felled or are about to be felled.
- [TLCC-61] The Contractor will advise affected land users in advance of start of right of way clearance, giving sufficient time to allow for the harvesting of any mature crops and to salvage structures.

3.8.2 Management Action

Community health and safety

- [TLCC-62] The Contractor shall install warning signs on towers and also at access roads that cross beneath the transmission lines warning of clearance requirements to live electrical conductors
- [TLCC-63] The Contractor shall install physical barriers (such as barbed wire) to prevent the public from climbing the towers. Appropriate signs will be installed on each tower warning of the dangers of climbing.

3.9 Traffic Management

The specifications outlined in this section are to be read in conjunction with Section 5.4.8 of the **Project-wide ESMP** and any Project Component specifications outlined in Section 4 of this **Transmission line ESMP**.

3.9.1 Planning Requirement

- [TLCC-64] The Contractor shall consult and work closely with traffic authorities, before construction, to establish a works calendar and determine the optimal timeline for such works, especially conductors' installation works.

3.9.2 Management Action

- [TLCC-65] The Contractor shall use flagmen at all public highway crossings during the stringing of conductor lines to ensure the safe passage of public highway users.

3.10 Noise from Conductor Lines

The specifications outlined in this section are to be read in conjunction with Section 5.3.9 of the **Project-wide ESMP** and any Project Component specifications outlined in Section 4 of this **Transmission line ESMP**.

3.10.1 Management Action

- [TLCC-66] The Contractor shall employ quality assurance checks through manufacturing and transportation to avoid damage to transmission line conductors.
- [TLCC-67] The Contractor shall ensure that the conductors are maintained clean and free of surface contaminants during stringing.

4.0 Project Component Specific Measures under the Responsibility of the Transmission Line Contractor

4.1 Introduction

This section outlines the **Project Component** measures that must be adopted by **transmission line contractors**. In conjunction with the obligations defined under the Contract, the Contractor will plan, execute and document construction works pursuant to the ESHS specifications set out in this section as appropriate.

The Contractor must also plan, execute and document construction works pursuant to the ESHS specifications set out in Section 3 of this **Transmission line ESMP** and Section 5 of the **Project-wide ESMP (Document 8.1, Volume 8)**.

4.2 Component A

4.2.1 Biodiversity and landscape

The specifications outlined in this section are to be read in conjunction with Section 3.5 of this document and Section 5.3.3 of the **Project-wide ESMP**.

Planning Requirement

Habitat and landscape Protection

- [TLCC-68] The Contractor shall employ an experienced biodiversity expert (refer to Specification 5.2.4 in **Project-wide ESMP**) to inform detailed design and enable the siting of towers, access tracks and working areas to minimise impacts on biodiversity in the following areas:
 - alpine scrub between KM46 and KM55 as illustrated by the sensitive areas highlighted in Figure 11a to 11c, Biodiversity Figures, Document 3.3, Volume 3 of the ESIA; and
 - sweet chestnut woodland between KM33 and KM37 as illustrated by the sensitive areas highlighted in Figure 11a to 11c, Biodiversity Figures, Document 3.3, Volume 3 of the ESIA.
- [TLCC-69] The distance between the Sairme line and the Borjomi-Kharagauli National Park should not be reduced from that specified in the Feasibility Study.
- [TLCC-70] On the Sairme line between KM55 and KM59, the Contractor shall not construct new access tracks by implementing the following approaches:
 - Using existing access tracks for access, if present;
 - Designing long conductor line spans between ridges and high points so that new access tracks are avoided between tower locations spanning ravines and valleys; and
 - Use low impact forms of transport to minimise impacts on ground vegetation, fauna and birds (pack animals, vehicles running low pressure tyres, helicopters) thus avoiding the need to construct access tracks.
- [TLCC-71] The approach to minimising access tracks in this area and the low impact methods proposed are to be reflected in the details submitted to the Biodiversity Clerk of Works and GSE/Implementation Consultant as outlined in Section 3.2 of this **Transmission line ESMP** for their approval prior to construction commencing on this section.
- [TLCC-72] The Contractor shall not construct borrow pits or construction compounds or any other infrastructure that would require the removal of vegetation and soils between KM55 and KM59.

Management Actions

Habitat protection

- [TLCC-73] The Contractor shall install 200 bat boxes within the G1.7D habitats or adjacent woodland along the Sairme line.
- [TLCC-74] No construction is to take place within the Rioni River for the purposes of protecting the spawning grounds of the Sturgeon. The following protocols must be adopted:
 - Any construction works on the river banks must be at least 10m from the edge of the river;
 - No construction materials or excavated material is to be placed in the river;
 - No access tracks are to be constructed through the river;
 - Construction vehicles are not to use existing accesses that cross the river bed and enter the river;
 - No bridge structures are to be built or temporary crossing structures are to be used to enable vehicles to cross the river;
 - The storage of oil and the handling and delivery of concrete is to follow the precautions

outlined in Section 5.3.4 of the **Project-wide ESMP**;

- For the stringing of the conductor lines, it is permitted to enter the river to pull a guide wire either by foot, by horse, or to use a single small 4x4 vehicle. This activity must be undertaken outside of the spawning season (April to July).

Avian Protection

- [TLCC-75] Bird deflectors shall be installed on the earth wire of the Sairme line between KM71 and KM41. Bird deflectors are to be designed in accordance with the requirements set out in Section 3.5.1 of this document.
- [TLCC-76] Construction activities are not to be undertaken during the black grouse lekking (first three weeks in May) and breeding season (May to July) in sensitive areas between KM62 and KM64 and between KM46 and 60, unless:
 - Pre-construction surveys have been undertaken 1 to 2 weeks before the commencement of work by the Biodiversity Clerk of Works;
 - There are no signs of black grouse found during the pre-construction surveys; and
 - The Biodiversity Clerk of Works and GSE/Implementation Consultant approve construction to start.

4.2.2 Site Reinstatement

The specifications outlined in this section are to be read in conjunction with Section 5.3.10 of the **Project-wide ESMP**.

Management Action

Site Reinstatement Planting

- [TLCC-77] The Contractor shall reinstate temporary construction working areas with Georgian Red List species such as sweet chestnut in areas where trees have been removed e.g., adjacent to access tracks and tower working and laydown areas.

4.2.3 Hydrology and Geohazards

The specifications outlined in this section are to be read in conjunction with Section 3.2 of this document.

Planning Requirement

Watercourse Crossings

- [TLCC-78] Taking into account the measures outlined in Section 4.2.1 for protecting the spawning sturgeon, the crossing of the Rioni River shall avoid all in-channel works within and adjacent to the river bed to avoid erosion and sediment generation and to reduce the risks of flooding to the Project. The construction works are to adhere to specifications set out in Section 4.2.1 of this **Transmission Line ESMP** and Section 5.3.4 and Section 5.3.6 of the **Project-wide ESMP**. The detailed design is to be approved by GSE/Implementation Consultant.

Geohazard avoidance

- [TLCC-79] The Contractor shall undertake detailed geohazard investigations where the risks of landslide have been identified from the geotechnical studies to be present in the municipalities of Adigeni and Akhaltsikhe. Measures shall be put in place to control geohazards to protect communities and infrastructure in these areas.
- [TLCC-80] The Contractor shall consult the relevant communities in the municipalities of Adigeni and Akhaltsikhe to explain the results of these studies, demonstrating the measures to mitigate geohazard risks
- [TLCC-81] The Contractor shall avoid all construction works that may potentially impact upon the unstable slopes of the deep ravine adjacent to the Akhaltsikhe Substation between KM0 and KM1.

4.2.4 Soil Management

The specifications outlined in this section are to be read in conjunction with Section 3.5 of this document and with Section 5.3.6 of the **Project-wide ESMP**.

Planning requirement

Soil Contamination

- [TLCC-82] The Contractor shall undertake a desk study to evaluate the risk of contamination of the Sairme line in former industrial areas of Kutaisi and Tskaltubo between KM0 and KM3. The desk study will inform the need for site investigation studies. The desk study report is to be submitted to the Implementation Consultant.
- [TLCC-83] Where required and agreed with the Implementation Consultant, intrusive ground investigation must be undertaken prior to any construction commencing at locations where historic land use indicates that there is a potential for contamination that may require occupational health and safety measures and environmental controls. It is anticipated that site investigations will be required on the Sairme Line between KM0 and KM3.
- [TLCC-84] A working scheme of investigation for the site investigation proposed at each location shall be agreed with GSE/Implementation Consultant in advance of the site investigation works commencing at each location.

4.2.5 Land Acquisition and Compensation

The specifications outlined in this section are to be read in conjunction with Section 5.4.7 of the **Project-wide ESMP**.

Planning requirement

- [TLCC-85] The Contractor shall liaise with GSE to coordinate and harmonise the land acquisition processes between GSE projects (Tskaltubo Substation, the Jvari-Tskaltubo 500kV line, and the Akhaltsikhe – Batumi line) to mitigate potential cumulative impacts on land acquisition and livelihoods.

Management Action

- [TLCC-86] The Contractor shall provide sufficient access to pasture lands for livestock during the construction process. As required, the Contractor will consult with communities to minimise any impact and help communities gain access to pasture lands as required. Communities shall not be prevented from accessing pasture lands.

4.2.6 Community Health and Safety

Planning requirement

- [TLCC-87] The Contractor shall co-ordinate with GSE and other Contractors of other GSE projects to ensure effective management of community health and safety and that measures to protect communities from risk of accident are applied consistently across the projects.

4.2.7 Traffic Management

Planning requirement

- [TLCC-88] The Contractor shall coordinate with GSE and its contractors of other projects to harmonise traffic management.

4.3 Component B

4.3.1 Biodiversity and Landscape

The specifications outlined in this section are to be read in conjunction with Section 3.5 of this document and Section 5.3.3 of the **Project-wide ESMP**.

Planning Requirement

Habitat and Landscape Protection

- [TLCC-89] The Contractor shall employ an experienced biodiversity expert (refer to Specification 5.2.4 in **Project-wide ESMP**) to inform detailed design and enable the siting of towers, access tracks and working areas to minimise impacts on biodiversity in the following locations:
 - The route between KM16 and KM41 to locate the least impact locations for towers, access tracks and other related infrastructure.
 - The pontine oak stands where the route passes near to the Managed Reserve of pontine oak (KM40 to KM43); and
 - Other sensitive habitats. Sensitive habitats are shown on Figure 11d, Biodiversity Figures, Document 3.3, Volume 3 of the ESIA.
- [TLCC-90] Should the alignment of the Guria line alter in the vicinity of Bakhmaro, this should be evaluated carefully to ensure the local landform and woodland cover are used to maximise the screening of the transmission line.

Management Action

Avian Ecology

- [TLCC-91] The Guria line shall be fitted with bird deflectors on the earth wire between KM7 to KM9, KM12 to KM16 and KM40 to KM43 to reduce collision risk in accordance with the specifications set out in. Bird deflectors are to be designed in accordance with the requirements set out in Section 3.5.1 of this document.
- [TLCC-92] The Contractor shall not undertake any construction activities during the lekking season (first three weeks in May) and breeding season (May to July) in the sensitive areas between KM 19 to KM 20 and KM24 to KM28, unless:
 - Pre-construction surveys have been undertaken 1 to 2 weeks before the comment of work;
 - There are no signs of black grouse found during the pre-construction surveys; and
 - The Biodiversity Clerk of Works and GSE/Implementation Consultant approve construction to start.
- [TLCC-93] The Contractor will fit bird deflectors, such as visible fencing (based on or similar to guidance in [https://www.forestry.gov.uk/PDF/FCTN019.pdf/\\$FILE/FCTN019.pdf](https://www.forestry.gov.uk/PDF/FCTN019.pdf/$FILE/FCTN019.pdf)) to the base of towers and up to 5m in height to increase the visibility of the tower structure to prevent/reduce the risk of collision by black grouse between KM19 and KM720 and KM24 and KM28.

4.3.2 Community Health and Safety

The specifications outlined in this section are to be read in conjunction with Section 3.8 of this document.

Planning requirement

- [TLCC-94] The Contractor will coordinate with GSE and the developer of the Zoti HPP to ensure effective management of community health and safety.

4.4 Component C1

4.4.1 Biodiversity and landscape

The specifications outlined in this section are to be read in conjunction with Section 3.5 of this document and Section 5.3.3 of the **Project-wide ESMP**.

Planning Requirement

Protection of Sensitive Biodiversity and Landscape Areas

- [TLCC-95] The Contractor shall employ an experienced biodiversity expert (refer to Specification 5.2.4 in **Project-wide ESMP**) to inform detailed design and enable the siting of towers, access tracks and working areas to minimise impacts on biodiversity in the following locations:
 - the Mestia line route between KM11 and KM22; and
 - other sensitive habitats in particular sweet chestnut dominant woodland. Sensitive habitats are shown on Figure 11e, Biodiversity Figures, Document 3.3, Volume 3 of the ESIA.
- [TLCC-96] The Contractor shall design the route over the Nenskra-Nakra Pass above the tree line to use the minimum number of towers to minimise impacts on biodiversity.
- [TLCC-97] On the Mestia line across the Nenskra to Nakra Pass between KM15 and KM20, the Contractor shall minimise the creation of new access tracks by implementing the following approaches:
 - Using existing access tracks for access;
 - Designing long conductor line spans between ridges and high points so that forest clearance and new access tracks are avoided between tower locations spanning ravines and valleys; and
 - Use low impact forms of transport to minimise tree and vegetation removal (pack animals, vehicles running low pressure tyres or helicopters).
- [TLCC-98] The approach to minimising access tracks in this area and the low impact methods proposed are to be reflected in the details submitted to the Biodiversity Clerk of Works and GSE/Implementation Consultant as outlined in Section 3.2 of this **Transmission line ESMP** for their approval prior to construction commencing on this section.
- [TLCC-99] The Contractor shall not construct borrow pits or construction compounds or any other infrastructure that would require the removal of vegetation and soils between KM15 and KM20.

Management Action

Nenskra-Nakra Pass

- [TLCC-100] The Contractor shall undertake additional precautions on the Nenskra-Nakra Pass above the treeline during construction including the following measures:
 - no new access tracks, compounds or artificial lay-down areas are to be used above the tree line; and
 - pack animals, vehicles running low pressure tyres or helicopters are to be used to bring in structures and materials.

Avian Ecology

- [TLCC-101] The Mestia line shall be fitted with bird deflectors on the earth wire between KM17 and KM19 to reduce collision risk. Bird deflectors are to be designed in accordance with the requirements set out in Section 3.5.1 of this document.
- [TLCC-102] The Contractor will fit bird deflectors, such as visible fencing (based on or similar to guidance in [https://www.forestry.gov.uk/PDF/FCTN019.pdf/\\$FILE/FCTN019.pdf](https://www.forestry.gov.uk/PDF/FCTN019.pdf/$FILE/FCTN019.pdf)) to the base of towers and up to 5m in height to increase the visibility of the tower structure to prevent/reduce the risk of collision by black grouse and snowcock between KM15 and KM20.
- [TLCC-103] No construction is to be undertaken during the lekking (first three weeks in May) and breeding season (May to July) in sensitive areas (between KM15 and KM21), unless:
 - Pre-construction surveys have been undertaken 1 to 2 weeks before the commencement of work;
 - There are no signs of black grouse found during the pre-construction surveys; and
 - The Biodiversity Clerk of Works and GSE/Implementation Consultant approve construction to start.

4.4.2 Site Reinstatement

The specifications outlined in this section are to be read in conjunction with Section 5.3.10 of the **Project-wide ESMP**.

Management Action

Site Reinstatement Planting

- [TLCC-104] The Contractor shall reinstate temporary construction working areas with Georgian Red List species such as sweet chestnut in areas where trees have been removed eg adjacent to access tracks and tower working and laydown areas.

4.4.3 Geohazards

The specifications outlined in this section are to be read in conjunctions with those specifications set out in Section 5.5.11 of the **Project-wide ESMP**.

Planning Requirement

- [TLCC-105] The Contractor shall undertaker detailed geohazard investigations where the risks of landslide have been identified from the geotechnical studies to be present in Chuberi and Nakra

communities. Where required, measures shall be put in place to control geohazards to protect the communities and infrastructure in these areas.

- [TLCC-] The Contractor shall consult the communities of Chuberi and Nakra to explain the results of these studies, demonstrating the measures to mitigate geohazard risks

4.4.4 Land Acquisition and Compensation

The specifications outlined in this section are to be read in conjunction with Section 5.4.7 of the **Project-wide ESMP**.

Planning requirement

- [TLCC-106] The Contractor shall coordinate with GSE and the developers of the Nenskra and Mestiachala HPPs to ensure effective management of potential cumulative impacts on the livelihoods of households by the land acquisition processes.

4.4.5 Community Health and Safety

Planning requirement

- [TLCC-107] The Contractor will coordinate with the developers of the Nenskra and Mestiachala HPPs to ensure effective management of community health and safety and that measures to protect communities from risk of accident are applied consistently across the projects

4.4.6 Traffic Management

Planning requirement

- [TLCC-108] The Contractor will coordinate with the developers of the Nenskra and Mestiachala HPPs to harmonise traffic management.

4.5 Component C2

4.5.1 Dismantling of Existing Transmission Lines

Planning Requirement

- [TLCC-109] The Contractor shall produce a Transmission Line Dismantling Management plan outlining how the existing transmission lines which are to be replaced (e.g. existing Derchi line) are to be dismantled, removed from site and stored/recycled in accordance with good international practice. The plan will include specific recommendations for sensitive areas (e.g. sensitive habitats illustrated in Figure 11f to 11h, **Biodiversity Project Component Assessment**, Document 3.3, Volume 3 of the ESIA) or within productive private lands, where manual dismantling should be used where practicable.

4.5.2 Biodiversity

The specifications outlined in this section are to be read in conjunction with Section 3.5 of this document and Section 5.3.3 of the **Project-wide ESMP**.

Planning Requirement

Protection of Sensitive Areas

- [TLCC-110] The Contractor shall employ an experienced biodiversity expert (refer to Specification 5.2.4 in **Project-wide ESMP**) to inform detailed design and enable the siting of towers, access tracks and working areas to minimise impacts on biodiversity in the following locations:
 - the Kheledula line route through KM12 and KM26 during the detailed design stage. These surveys are to be undertaken using existing the access track network and/or from the air using, helicopters or drones.
 - sensitive habitats, in particular, sweet chestnut dominant woodland, as illustrated by Figures 11f to 11h, Biodiversity Figures, Document 3.3, Volume 3 of the ESIA.
- [TLCC-112] On the Kheledula line between KM12 and KM26, the Contactor shall minimise the creation of new access tracks by implementing the following approaches:
 - Using existing access tracks for access;
 - Designing long conductor line spans between ridges and high points so that forest clearance and new access tracks are avoided between tower locations spanning ravines and valleys; and
 - Use low impact forms of transport to minimise tree and vegetation removal (pack animals, vehicles running low pressure tyres or helicopters).
- [TLCC-113] The approach to minimising access tracks in this area and the low impact methods proposed are to be reflected in the details submitted to the Biodiversity Clerk of Works and GSE/Implementation Consultant as outlined in Section 3.2 of this **Transmission line ESMP** for their approval prior to construction commencing on this section.

Management Action

Habitat Protection

- [TLCC-114] The Contractor shall install 200 bat boxes on the Lechkhumi line within the G1.7D habitats or adjacent woodland.

Avian Ecology

- [TLCC-115] The Contractor will install bird deflectors on the New Derchi line earth wire where it loops into and out of the Upper Namakhvani (UNK) powerhouse (New Derchi Namakhvani loop line) within the Rioni River Tvishi gorge.
- [TLCC-116] The Contractor shall install bird deflectors on the earth wire along both the New Derchi and the Lechkhumi lines. The bird deflectors shall be install between KM3 and KM10 on the Lechkhumi line and between KM4 and KM10 on the New Derchi line. Bird deflectors are to be designed in accordance with the requirements set out in Section 3.5.1 of this document.
- [TLCC-117] If nesting of Griffon or Egyptian vultures on the New Derchi Namakhvani loop is confirmed, by the Biodiversity Clerk of Works (employed by GSE), within 1km of proposed construction activity, no construction must take place within 1km of these nests during the vulture breeding season (March to mid-September).

4.5.3 Site Reinstatement

The specifications outlined in this section are to be read in conjunction with Section 5.3.10 of the **Project-wide ESMP**.

Management Action

Site Reinstatement Planting

- [TLCC-118] The Contractor shall reinstate temporary construction working areas with Georgian Red List species such as sweet chestnut in areas where trees have been removed on all transmission lines in Component C2 eg, adjacent to access tracks and tower working and laydown areas.

4.5.4 Land Acquisition and Compensation

The specifications outlined in this section are to be read in conjunction with Section 5.4.7 of the **Project-wide ESMP**.

Planning Requirement

- [TLCC-119] The Contractor shall coordinate with GSE and the developers of the Namakhvani, Oni, and Kheledula HPPs to ensure effective management of potential cumulative impacts on the livelihoods of households by the land acquisition processes.

4.5.5 Community Health and Safety

Planning requirement

- [TLCC-120] The Contractor will coordinate with GSE and the developers of the Namakhvani, Oni, and Kheledula HPPs to ensure effective management of community health and safety and that measures to protect communities from risk of accident are applied consistently across the projects.

4.5.6 Traffic Management

Planning requirement

- [TLCC-121] The Contractor will coordinate with the developers of the Namakhvani, Oni, and Kheledula HPPs to harmonise traffic management.

4.6 Component D

4.6.1 Detailed Design of Transmission Lines and Associated Temporary Infrastructure

The specifications outlined in this section are to be read in conjunction with Section 3.2 of this document.

Planning Requirement

- [TLCC-122] The Contractor shall re-use as far as is practicable, the existing tower locations and cleared right of way for those sections of the line which are proposed to be re-used by the Feasibility Study.
- [TLCC-123] The Contractor shall design the location of towers to minimise the impacts on vineyards, as much as practically possible. The design shall also be done in consultation with landowners and with their agreement
- [TLCC-124] The Contractor is not to locate main construction accesses, compounds or storage areas

immediately adjacent to vineyards.

4.6.2 Dismantling of Existing Transmission Lines

Planning Requirement

- [TLCC-125] The Contractor shall produce a Transmission Line Dismantling Management plan outlining how the existing transmission lines which are to be replaced are to be dismantled, removed from site and stored/recycled in accordance with good international practice.
- [TLCC-126] The plan shall include specific recommendations for sensitive areas (e.g., sensitive habitats illustrated in Figure 11i to 11j, Biodiversity Figures, Document 3.3, Volume 3 of the ESIA) or within productive private land.
- [TLCC-127] The Contractor shall agree with the Biodiversity Clerk of Works and the Archaeological Clerk of Works, the avoidance plan for minimising the cutting or damaging the trees of the Forest planted as a World War II memorial (KM13 Gurjaani Line) during construction, as much as possible.
- [TLCC-128] In vineyards towers shall be removed using manual dismantling and the use of horses and small vehicles should only be used for the removal of towers where practicable in order to minimise damage to vineyards.

4.6.3 Biodiversity

The specifications outlined in this section are to be read in conjunction with Section 3.5 of this document and Section 5.3.3 of the **Project-wide ESMP**.

Planning Requirement

Protection of Sensitive Areas

- [TLCC-129] The Contractor shall employ an experienced biodiversity expert (refer to Specification 5.2.4 in **Project-wide ESMP**) to inform detailed design and enable the siting of towers, access tracks and working areas to minimise impacts on biodiversity within the candidate Emerald site. Any identified sensitive habitats shall then be avoided in the detailed design or appropriate mitigation or compensation provided.
- [TLCC-130] The Contractor shall employ an experienced biodiversity expert (refer to Specification 5.2.4 in **Project-wide ESMP**) to inform detailed design and enable the siting of towers, access tracks and working areas to minimise impacts on biodiversity in the following locations:
 - sensitive habitats as illustrated by Figures 11i to 11j, Biodiversity Figures, Document 3.3, Volume 3 of the ESIA; and
 - In the area surrounding the Gurjaani Substation to minimise tree loss around the substation.

Management Action

Avian Ecology

- [TLCC-131] The Contractor shall fit bird deflectors on the earth wire between KM24 and KM35 to reduce collision risk. Bird deflectors are to be designed in accordance with the requirements set out in Section 3.5.1 of this document.

4.6.4 Site Reinstatement

The specifications outlined in this section are to be read in conjunction with Section 5.3.10 of the **Project-wide ESMP**.

Planning Requirement

Landscape restoration of cable section

- [TLCC-132] The Contractor shall add to the Site Reinstatement Plan (see Section 5.3.10 of the **Project-wide ESMP**) how it intends to reinstate soils and vegetation along the route of the underground cable section on Component D. This is to be submitted to GSE/Implementation Consultant for approval.
- [TLCC-133] The Contractor shall add to the Site Reinstatement Plan (see Section 5.3.10 of the **Project-wide ESMP**) how it intends to reinstate soils and vegetation surrounding cable sealing end compounds on Component D. This is to be submitted to GSE/Implementation Consultant for approval.

Management Action

Site Reinstatement Planting

- [TLCC-134] The Contractor shall reinstate temporary construction working areas with Georgian Red List species such as elm (*Ulmus glabra*) and walnut (*uglans regia*) in areas where trees have been removed e.g., adjacent to access tracks and tower working and laydown areas.

5.0 Measures under the Responsibility of GSE/Implementation Consultant

5.1 Introduction

This section outlines the general environmental and social responsibilities that fall upon GSE/Implementation Consultant in relation to the transmission lines. This list of specifications should also be read in conjunction with Section 6 of the **Project-wide ESMP**.

A number of management actions listed in the present ESMP are the responsibility of GSE, even though in many instances, during the detailed design and construction phases, responsibilities will be delegated to the Implementation Consultant. At this stage no distinction is made between GSE and Implementation Consultant responsibilities.

5.2 Tree and Vegetation Removal in the Transmission Line Right of Way

5.2.1 Management Action

As noted in Section 3.4.1, there can be significant adverse effects arising from tree removal if this goes beyond the minimum necessary or is completed in an appropriate manner. Tree removal during the operational phase must be designed to meet the criteria set out in Section 3.4.1 and to meet the agreed clearance requirements of Table 3.1.

Maintenance of the Right of Way

- [OPTL-1] GSE shall plan a maintenance programme for tree and vegetation cutting based on a 5-year maintenance cycle to ensure the operational safety standards are maintained for the Project.
- [OPTL-2] GSE will implement a Tree and Vegetation Removal Plan for the maintenance of the right of way. The specification is to be developed in accordance with the specifications set out in Section 3.4 and include the following measures:
 - Mechanical clearing techniques only shall be used. Herbicides are not to be used for the removal of trees and vegetation.
 - Pruning of trees shall be considered first before any tree removal. Ground cover shall be retained where practical.
 - Wildlife refuges (e.g., timber trunk piles, branchless trees, bat boxes) are identified, mapped and protected during any maintenance works. Intervention is only permitted if there is an operational safety concern and alternative wildlife refuges are to be installed after maintenance works.
 - Maintenance activities are to be undertaken outside of the breeding season for birds (birds and bats – typically March to August inclusive), unless checks of the Project area are undertaken first to confirm no breeding activity.
 - On the Kheledula line between KM12 and KM26, GSE shall use low impact forms of transport during tree and vegetation removal (e.g. pack animals). No new access tracks shall be constructed.

5.3 Biodiversity

GSE will undertake an important role in the protection of biodiversity alongside the measures that the contractor must make. Among the measures that are the responsibility of GSE and which require their continued input and investigation are measures to mitigation and compensation for the following:

- Compensation planting to replace trees lost due to the creation of the right of way. GSE has developed proposals with the National Forestry Agency (NFA) for the NFA to undertake planting using tree species grown at their national tree nursery. This will require GSE to engage the NFA and work with municipalities to agree and identify areas of land to be used for the planting of trees. The NFA will manage the tree planting process and they will develop the Reforestation Management Plan under the instruction of GSE;
- Protection of birds and other fauna ahead of construction by engaging a Biodiversity Clerk of Works who will be responsible for undertaking pre-construction surveys;
- Implementation of monitoring and management plans to include monitoring of birds and the collection of biodiversity data for locations of the project passing through protected areas eg, Emerald sites and IBAs.

5.3.1 Planning requirements

Compensation planting for loss of trees in the transmission line right of way

- [OCTL-1] GSE shall implement a programme of tree planting compensation for each Project Component due to forest loss from right of way clearance by the contractor.
- [OCTL-2] This shall be achieved through the implementation of a Reforestation Management Plan specific to each component, to ensure that no net loss of forest habitat occurs due to the Project.
- [OCTL-3] GSE shall engage the National Forestry Agency to develop and implement the Reforestation Management Plan. GSE shall submit the Reforestation Management Plan to the Lenders for approval.
- [OCTL-4] GSE shall identify land to be used for tree planting in discussions with the National Forestry Agency and the local municipalities.
- [OCTL-5] The amount of compensation planting shall be based on the areas of tree loss resulting from the Project. This will ultimately be defined in the Contractors Vegetation and Tree Clearance Plan for each Project Component (see Section 3.4.1). As a guide, the estimated areas of tree loss and the broad species types are given in the mitigation section of each Project Component in the **Biodiversity Project Component Assessment** (Document 3.2).
- [OCTL-6] GSE shall inform the National Forestry Agency of the specific tree compensation programme based on the given tree loss.

Avian ecology

- [OCTL-7] The Biodiversity Clerk of Works will undertake pre-construction surveys for birds during the breeding season to ascertain presence of breeding and nesting birds for the following locations:
 - Component A - sensitive areas between KM62 – KM64 and KM46 – KM60 for Caucasian black grouse or Caspian snowcock
 - Component B - sensitive areas between KM19 to KM20 and KM24 to KM28 for Caucasian black grouse.
 - Component C1 - sensitive areas KM15 to KM21 for Caspian snowcock or Caucasian black

grouse

- Component C2 - The Tvishi Gorge within the Rioni River to establish if there are nesting Griffon and Egyptian vultures.

5.3.2 Management Actions

Habitat and avian protection

- [OCTL-8] The Biodiversity Clerk of Works, employed by GSE, is present on-site to undertake any necessary micro-siting of construction works to avoid any sensitive features found and, in particular, seeks to minimise and avoid the removal of trees especially any red list species, focussing on the following areas:
 - Component A – sweet chestnut woodland between KM33 and KM37;
 - Component B – Pontine Oak between KM40 and KM43;
 - Component C1 – Sweet chestnut woodland throughout Component C1;
 - Component C2 – Sweet chestnut woodland throughout Component C2;
 - Component D - PBF (KM27) and the Gombori candidate Emerald site.

Bat Box Mitigation

- [OCTL-9] The Biodiversity Clerk of Works shall advise the contractor on the placement of bat boxes as per the requirement set out in Section 4.2.1 and 4.5.2.

Avian ecology monitoring

- [OPTL-10] GSE shall implement a bird monitoring programme for those sections of Components A and B within the Adjara-Imereti Ridge IBA to assess the in-combination effects of raptor mortality (collision) and impacts on black grouse population levels. The results would inform the need for additional mitigation.
- [OPTL-11] GSE shall implement a monitoring programme for the Mestia line for Caucasian black grouse, Caspian snowcock and raptors. The results would inform the need for additional bird deflectors, if required.
- [OPTL-12] Subject to the outcome of the surveys undertaken in accordance with [OCTL-7], GSE shall fit additional bird deflectors, if required, to the base of towers on the Mestia Line and up to 5m in height to increase the tower structure visibility. This is designed to prevent/reduce the risk of collision by snowcock and grouse between KM14 and KM21. In addition, the need for additional earth wires bird deflectors should be established for raptor mitigation.
- [OPTL-13] GSE shall implement a bird collision monitoring programme for the New Derchi line and the Lechkumi line between KM3/4 and KM10 and the loop into the UNK powerhouse.

Conservation measures

- [OCTL-14] GSE shall set up biodiversity data sharing agreement with stakeholders for protected areas (IBA, SPA, NP and proposed Emerald site), for past and future biodiversity data relating to this Project for the following lines:
 - Sairme Line (Component A)
 - Guria Line (Component B)

- Mestia Line (Component C1)
- Akhmeta and Gurjaani line (Component D)
- [OCTL-15] GSE shall fund and agree a funding cap and work with Bird Life International, to write an Imereti-Adjara IBA target species management plan for Caucasian black grouse. The funding cap and the management plan shall be agreed with the Lenders.
- [OCTL-16] GSE shall fund and agree a funding cap and work with BirdLife International, to write a Svaneti IBA target species management plan for Caucasian black grouse and Caspian snowcock. The funding cap and the management plan shall be agreed with the Lenders.
- [OCTL-17] GSE shall fund and agree a funding cap and work with NACRES, to fund the undertaking of further baseline surveys and/ or writing of a defined number of conservation management plans, for the Gombori proposed Emerald Site. The funding cap and the management plan shall be agreed with the Lenders.

5.4 Aircraft Navigation Safety

5.4.1 Planning Requirement

- [OCTL-18] GSE will engage with the aeronavigation authorities during the detailed design stage to notify them of the routes and dimensions of the proposed transmission lines and to confirm any safety measures that may be necessary for:
 - The Mestia line with respect to Mestia Airport;
 - The Oni HPP line with respect to Ambrolauri Airport; and
 - The Akhmeta and Gurjaani lines with respect to Telavi Airfield.

5.5 Resettlement and Land Acquisition

5.5.1 Planning Requirement

- [OCTL-19] The RAP to be prepared for the Sairme line will take into account the summer grazing rights and customs of the local communities and will define livelihood restoration measures as appropriate.
- [OCTL-20] The RAP to be prepared for the Guria line will take into account the informal use of forest and State land by the affected people and will define livelihood restoration measures as appropriate.
- [OCTL-21] The RAP to be prepared for the Mestia line will take into account collective customary right of use of summer pasture areas and define individual and/or collective livelihood restoration measures as appropriate.
- [OCTL-22] GSE shall inform the Contractor of the need to co-ordinate with other GSE projects (Tskaltubo Substation, the Jvari-Tskaltubo 500kV line, and the Akhaltsikhe – Batumi line) so that the potential cumulative impacts on land acquisition and livelihoods can be managed and minimised.
- [OCTL-23] GSE shall coordinate with the Contractor and the developers of the Nenskra and Mestiachala HPPs to ensure effective management of potential cumulative impacts on the livelihoods of households by the land acquisition processes.
- [OCTL-24] The Contractor shall coordinate with GSE and the developers of the Namakhvani, Oni, and Kheledula HPPs to ensure effective management of potential cumulative impacts on the livelihoods of

households by the land acquisition processes.

5.6 Highways and Railway Usage and Safety

5.6.1 Planning Requirement

Roads Safety

- [OCTL-25] GSE shall support the Contractor in negotiations with the relevant highway authorities to ensure that there are adequate controls and procedures in place for minimising impacts and maximising safety precautions on public highways, in particular, major road crossings eg motorway crossing on Component A.

Railways Safety

- [OCTL-26] GSE will engage the railway authority and schedule the work to minimise rail traffic interruption.
- [OCTL-27] GSE will inform the Contractor of any special requirements regarding the timing of works.
- [OCTL-28] GSE will inform the Contractor of any special construction requirements that might be required to protect any railway infrastructure.

5.7 Community Health and Safety

5.7.1 Management Action

- [OPTL-29] In the event of complaints regarding micro-shocks, the GSE will ground any conducting objects (e.g. fences or other metallic structures) where located near to the transmission lines.
- [OPTL-30] In the event of a complaint with regards to EMF, GSE will provide support and information to provide reassurance that the EMF levels meet the international requirements set out in ICNIRP.

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