DETAILED IEE REPORT

CONSTRUCTION OF 220kV D/C (LILO) TRANSMISSION LINE FROM DHAMDUM SUBSTATION TO NORBUGANG SUBSTATION UNDER NORBUGANG GEWOG, SAMTSE

OCTOBER 27, 2023

BHUTAN POWER CORPORATION LIMITED
Contracts Management Section

Initial Environmental Examination (IEE) Form for Transmission and Distribution Projects -2017

Note 1:	In accordance with section 47 of the Regulation for Environmental Clearance of Projects 2016, consent must be obtained from individual or juristic person if activity has direct impact on a property.
Note 2:	The completed IEE form shall be submitted to the relevant Competent Authority.
Note 3:	The completed IEE form shall be the basis to determine the requirement of Environmental Impact Assessment (EIA). If EIA is required, applicant will be notified to submit Terms of Reference for the project.
Note 4:	The application shall be subjected to Fee Schedules to cover the cost of administering the Environmental Assessment Act, 2000.

1. General Information:

a) Name of the project: Construction of 220kV D/C (LILO) Transmission Line from Dhamdum Substation to Norbugang Substation

I. Voltage level in kV: 220kV

b) Project Type (Tick as appropriate): ☑ New ☐ Expansion/modification

c) Applicant Details:

I. Name of the applicant: 400kV Transmission Line Project Office, Norbugang Industrial Park Project (NIPP), Bhutan Power Corporation Limited

II. Address: 400kV Transmission Line Project Office, Norbugang Park Project (NIPP), BPC, Samtse

III. Post Box No.: N/A

IV. Contact No.: +975-5-365934/17501763

V. Fax No.: N/A

VI. Email: manikumargurung@bpc.bt

VII. Name and contact details of Environmental Focal Person: Ugyen Dorji, Dy. Environment Officer, 17652616 (mobile)

2. Project Location:

I. Dzongkhag/Thromde: Samtse

II. Gewog: Samtse, Norbugang

III. Village: Dhamdum, Alay

IV. Name of the project site: Dhamdum, Norbugang, Alay

3. Project Cost (Nu.): 105 million

4. Project area, tick as appropriate:

a) ☑State Reserve Forest: 49.39 acres

b) ☑Private: 5.78 acres

c) ☐Others:

d) Total area required: 55.17 acres

6. Presence of any of the following within and 50 meters buffer of the project area. If yes tick and mention name, wherever applicable:

a) ☐River/spring/stream…….

b) ☐Protected Area……

c) ☐Catchment area……..

d) ☐Wetland…….

e) ☐Community forest…….

f) ☐Private forest…….

g) ☐Tsamdro……..

h) ☐Sokshing……..

i) ☑Agriculture land:

S.N	Village	Gewog	Tower Location	Area of TL
1.	Alay	Samtse	AP17 to AP18	135 x 35 meters

j) ☐Heritage site……..

k) ☐Hospital……

l) ☐School/institution……

m) ☑Roads: Farm and Feeder Roads under Samtse Gewog

n) ☐Industries…….

o) ☐Settlements:

☐Presence of religious site…….

p) ☐Archaeological site…….

q) ☐Others

6. Project Details:

a) Project objective:

The overall objective of the project is to provide reliable power supply for the Norbugang Industrial Park (NIP) while also ensuring better power reliability for Samtse Dzongkhag.

b) Length of transmission /distribution line in km: 6.381 km

S.N	Point	Latitude	Longitude	Place
I.	Start	26.909530°	89.104970°	Dhamdum, Samtse Gewog
II.	Termination	26.925171°	89.047772°	Chengmari, Norbugang Gewog

c) Right of Way in meters: 35 meters

d) Tower types and numbers:

Tower Type	Tower Number
DB, DC, DD, DD+	23

e) Methods of storing materials:

S.N	Store Yard	GPS Coordinates		Land Ownership
		Latitude	Longitude	
1.	Norbugang Substation Area	26.925668°	89.047367°	BPC

The construction materials for the towers shall be stored at the aforementioned location.

f) Does the proposed transmission/distribution line passes through:

I. Avi-fauna migratory routes ☐Yes ☑No

II. Heritage or religious site ☐Yes ☑No

III. Wetland and catchment area ☐Yes ☑No

IV. If yes for any of the above, provide alternatives

7. Ancillary activities, tick as appropriate:

a) ☐Substation

b) ☑Approach road

c) ☐Ropeway

d) ☐Others

Note: For ancillary activities, fill up relevant IEE forms and submit along with these IEE forms.

8. List type of solid wastes and its quantity:

Types Of Solid Waste Materials	**Expected Quantity to be Generated per day (kg)**	**Remarks**	**Management Method**
Food waste, plastics/packaging materials, cardboard, & common trash (HOUSEHOLD WASTES)	**37.95 kg/day** from approx. 150 nos. of workers for the TL project.	As per National Waste Management Strategy 2019, an average of 0.253 kg/capita/day for approximately solid waste will be generated.	Disposed-off to Municipal Solid Waste landfill sites. The waste that can be recycled will be sold off to local scrap dealers.
Wood (timber, slash, stumps, etc.) *	1200 trees and 1000 pole size trees	Approximate estimates.	The trees cut from the RoW clearing will be handed over to the respective community forest management and NRDCL for extraction and disposal as per the rule.
Metals (Ferrous and Non-Ferrous) including junk and cut-out conductors, optical fibers, and metal structures.	2% of Tower pylons & conductors waste.	Waste from the 23 nos. of towers with approx. 6.3 km d/c conductors.	Transport to scrap/Metal recycling company and managed as per SOP for Waste Management in DHI & DHI Companies 2020, BPC's Waste Management Plan 2021, BPC's Guidelines for disposal of Optical Fiber waste/e-waste, and all other relevant Waste Management policies of the country.

Wooden Cable Spools, Pallets, and Wooden Insulator Crates.	~6 nos. of Wooden Cable Spools & ~100 nos. of Wooden Insulator Crates.	Waste from the 23 nos. of towers with approx. 6.3 km d/c conductors.	Manage for reuse by locals or can be used as firewood.
Concrete Debris	2% concrete debris from the proposed project	Waste from the construction sites	Use as road sub-base material or used for concrete pavement foundation for Tower Foundations.
Excavated Spoils	Excavated spoils from the 23 nos. of tower pit foundations.		Loose excavated soil shall be covered and more than 90% of the excavated soil shall be reused for backfilling the tower pits.

9. Environmental Management Plan (attached in a separate sheet):

   Briefly describe mitigation measures to address impacts including section 8

10. List of documents to be attached with this IEE form:

1	Sectoral Clearance (DOPFS/DoR/BPC etc.), if applicable
2	Dzongkhag/Thromde Administrative approval
3	Public consultation records verified by the concerned local authority
4	Layout plan and KMZ file depicting entire layout plan

Name and signature of the project proponent: Ugyen Dorji, Deputy Environment Officer

Address: Contracts Management Section, Construction Division, CPD, BPC, Thimphu

Date: 27.10.2023

Initial Environmental Examination (IEE) Form for Road Projects -2017

Note 1:	In accordance with section 47 of the Regulation for Environmental Clearance of Projects 2016, consent must be obtained from individual or juristic person if activity has direct impact on a property.
Note 2:	The completed IEE form shall be submitted to the relevant Competent Authority.
Note 3:	The completed IEE form shall be the basis to determine the requirement of Environmental Impact Assessment (EIA). If EIA is required, applicant will be notified to submit Terms of Reference for the project.
Note 4:	The application shall be subjected to Fee Schedules to cover the cost of administering the Environmental Assessment Act, 2000.

1. General Information:

a) Name of the project, tick as appropriate: Construction of access roads to tower locations of the 220kV D/C (LILO) Transmission Line from Dhamdum Substation to Norbugang Substation under Samtse Dzongkhag.

I. ☐Highway/Feeder Road
II. ☐Farm Road
III. ☐Private Road
IV. ☐Forest Road
V. ☑Access Road
VI. ☐Tunnel Road
VII. ☐Others

b) Project Type (Tick as appropriate): ☑ New ☐ Widening

c) Applicant Details:

VIII. Name of the applicant: 400kV D/C Transmission Line Project Office, BPC
IX. Address: 400kV D/C Transmission Line Project Office, NIPP, BPC, Samtse
X. Post Box No.: N/A
XI. Contact No.: +975-5-365934/17501763
XII. Fax No.: N/A
XIII. Email: manikumargurung@bpc.bt
XIV. Name and contact details of Environmental Focal Person:

a. Name: Ugyen Dorji (Mr.)
b. Contact No: +975 17652616
c. email: ugyendorji2013@bpc.bt

2. Project Location:

V. Dzongkhag/Thromde: Samtse
VI. Gewog: Samtse, Norbugang
VII. Village: Alay, Norbugang
VIII. Name of the project site: Construction of 220kV D/C (LILO) Transmission Line Project

3. Project Cost (Nu.): 105 million

4. Project area, tick as appropriate:

a) ☑ State Reserve Forest: 2.49 acres
b) ☑ Private: 0.46 acres
c) ☐ Others…….acres
d) Total area required…….acres

5. Presence of any of the following within and 50 meters buffer of the project area. If yes tick and mention name, wherever applicable:

a) ☐River/spring/stream……..
b) ☐Protected Area……
c) ☐Catchment area……..
d) ☐Wetland…….
e) ☐Community forest
f) ☐Private forest…….
g) ☐Tsamdro……..
h) ☐Sokshing……..
i) ☐Agriculture land
j) ☐Heritage site……..
k) ☐Hospital……
l) ☐School/institution……
m) ☐Roads…….
n) ☐Industries…….
o) ☐Settlements…….

p) ☐Presence of religious site…….

q) ☐Archaeological site…….

r) ☐Others

6. Project Details:

a) Project objective: The construction of access roads to the proposed tower locations for the construction of 220kV D/C (LILO) Dhamdum Substation to Norbugang Substation is crucial for the transportation of construction materials at site. The Transmission Line Project is important to ensure supply of sufficient power load to the Norbugang Industrial Park. The access roads shall enable expediting works at site and timely completion of the project. The access roads will also benefit the general public.

b) Length of road in km: 3.05 km

S.N	**Tower Location**	**Start**		**Termination**		**Length (meters)**
		Latitude	**Longitude**	**Latitude**	**Longitude**	
1.	AP03 to AP04	26.908806°	89.103626°	26.911161°	89.100042°	462
2.	AP05 to AP08	26.917807°	89.090605°	26.917769°	89.087644°	806
3.	AP09 to AP10	26.918341°	89.080905°	26.917342°	89.084228°	746
4.	AP12	26.917042°	89.072926°	26.916845°	89.072716°	30.9
5.	AP13	26.919563°	89.068983°	26.919228°	89.068881°	36
6.	AP14	26.920034°	89.068002°	26.921578°	89.067509°	252
7.	AP16 to AP17	26.926500°	89.061505°	26.924276°	89.058362°	538
8.	AP18	26.925164°	89.056580°	26.924847°	89.056656°	92
9.	AP19	26.924363°	89.054204°	26.924859°	89.054115°	85.1
					Total Length	**3048**

c) Right of Way in meters: 4 meters

d) Type of drain: Subgrade Drain

e) Blasting requirement: ☐Yes ☑ No

- If yes, mention type of blasting:

f) Methods of storing materials: The construction of access road shall involve only first and second cutting with subgrade drains. Excavated muck/earth shall be used along the access road for fill ups.

g) Does the proposed road passes through:

I. Terrestrial fauna migratory routes ☐Yes ☑No

II. Heritage or religious site ☐Yes ☑No

III. Wetland and catchment area ☐Yes ☑No

IV. If yes for any of the above, provide alternatives.

h) Briefly describe the terrain characteristics along the proposed road alignment focusing on geotechnical and geomorphology information.

Geotechnical Information	
1. Soil Composition	The soil along the road alignment consists of a mix of clay, silt, and weathered rock. The clayey soil is present in lower sections, while the upper sections comprise of weathered rock and sandy soil.
2. Stability Analysis	The slope stability analysis indicated that there are moderate to steep slopes along certain sections of the roads alignment. These slopes are susceptible to erosion and landslides during heavy rainfall or seismic events. Mitigation measures, such as retaining walls and slope stabilization techniques, will be required in these areas.
3. Foundation Conditions	The geotechnical investigation determined that the foundation conditions are generally favorable. The underlying soil and rock formations provide good bearing capacity for structures, allowing for straightforward foundation design and construction.
Geomorphology Information	
1. Topography	The terrain along the road alignment is characterized by undulating topography with varying elevations. It includes both gradual slopes and steeper sections, requiring careful alignment design to ensure safe and efficient road construction.
2. Drainage Patterns	Natural drainage patterns consist of intermittent streams and small watercourses crossing the road alignment. Proper drainage structures such as a subgrade drain will be designed and implemented to manage surface water runoff and prevent water accumulation on the road.
3. Geological Features	The presence of occasional rock outcrops and minor fault lines was observed. These features will be considered during construction to ensure proper excavation measures are employed as necessary.

4. Erosion and Sedimentation	Due to the hilly terrain, certain areas along the alignment are prone to erosion, particularly during intense rainfall events. Erosion control measures, such as slope revegetation, erosion blankets, and sediment traps, will be implemented to minimize sedimentation on the road and adjacent water bodies.

7. Ancillary activities, tick as appropriate:

e) ☐Bridge

f) ☐Crushing plant

g) ☐Asphalt plant

h) ☐ Concrete batching plant

i) ☐Others

Note: For ancillary activities, fill up relevant IEE forms and submit along with these IEE forms.

8. List type of solid wastes and its quantity:

Type of Solid Wastes	**Quantity**
1. Construction Debris	
Excavated Soil	Approximately 11,989.2 sq. meter
Rocks and Stones	Approximately 100 metric tons
2. Vegetation Waste	
Trees	Approximately 1200 trees enumerated
3. Miscellaneous Waste	
General Office Waste	Approximately 10 kg/month
Food packaging waste	Approximately 5 kg/month
Disposable Materials (Single-use plastics)	Approximately 1 kg/month

9. Environmental Management Plan (attached in a separate sheet):

Briefly describe mitigation measures to address impacts including sections 9 and 10

10. List of documents to be attached with this IEE form:

1	Sectoral Clearance (DOPFS/DoR/BPC etc.), if applicable
2	Dzongkhag/Thromde Administrative approval
3	Public consultation records verified by the concerned local authority
4	Layout plan and KMZ file depicting entire layout plan
5	Map specifying critical catchment and drainage area for Feeder road and National Highways

Name and signature of the project proponent: Ugyen Dorji, Deputy Environment Officer

Address: Contracts Management Section, Construction Division, CPD, BPC, Thimphu

Date: 27.10.2023

ENVIRONMENTAL MANAGEMENT PLAN

CONSTRUCTION OF 220kV D/C (LILO) TRANSMISSION LINE FROM DHAMDUM SUBSTATION TO NORBUGANG SUBSTATION UNDER NORBUGANG GEWOG, SAMTSE

OCTOBER 27, 2023

BHUTAN POWER CORPORATION LIMITED

Contracts Management Section

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1. ACRONYMS AND ABBREVIATIONS

BPC	Bhutan Power Corporation Limited
DC	Direct Current
CMS	Contracts Management Section
EC	Environmental Clearance
EMP	Environmental Management Plan
GDE	Groundwater Dependent Ecosystems
HDPE	High Density Polyethylene
IMS	Integrated Management System
DECC	Department of environment and Climate Change
NIA	Noise Impact Assessment
ODS	Ozone Depleting Substance
PPE	Personal Protective Equipment
PNH	Primary National Highway
SDS	Safety Data Sheet
TIA	Traffic Impact Assessment
TMT	Thermo-Mechanical Treatment
UNDP	United Nation Development Programme
WBM	Water Bound Macadam
XLPE	Cross-linked Polyethylene

2. Introduction

This EMP has been prepared to meet the requirements set out in Chapter II – Application for Environmental Clearance – Preparation of an Application (Clause 7) of the Regulation for Environmental Clearance of Projects 2016.

This Plan has been developed to identify and provide the strategic framework for environmental Management for expected environmental impacts arising from the construction of the realigned section and its associated access roads of the 220kV D/C (LILO) Transmission Line from Dhamdum Substation to Norbugang Substation, Samtse Dzongkhag.

The purpose of this EMP is to provide the framework for environmental management of the construction phase of the Project. It is the responsibility of the Contractor (project staff, contractors and subcontractors) to comply with the objectives and requirements of this EMP and related documents where required by their respective scope of works.

Specifically, this document:

- Provides the strategic framework for environmental management of the Project and associated access roads,
- Sets the environmental objectives or standards to be achieved in compliance with legislations, standards and guidelines,
- Identifies relevant legal requirements,
- Describes the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the project for BPC and the Contractor,
- Describes strategies to ensure site personnel (BPC and the Contractor) are aware of the environmental risks associated with the activity, and are trained in the measures and contingency plans to deal with them,
- Details the monitoring and review program to evaluate environmental performance and ensure the effectiveness of environmental controls and contingency plans,
- Outlines the mechanisms for communication of environmental information throughout the organization and other stakeholders;
- Describes the procedures that would be implemented to:
    - Keep the local community and relevant agencies informed about the operation and environmental performance of the development;
    - Receive, handle, respond to, and record complaints;
    - Resolve any disputes that may arise;
    - Respond to any non-compliance;
    - Respond to emergencies;
    - Measures to mitigate potential environmental impacts and protect any special environmental characteristics of the site;

2.1 BPC Overview

BPC has been entrusted to carry out the construction of 220kV D/C (LILO) Transmission Line from Dhamdum Substation to Norbugang Substation, Samtse.

BPC with its registered head office in Thimphu, has a highly experienced management team of energy infrastructure, engineering, procurement and construction professionals with specific experience in the construction of utility-scale transmission and distribution systems.

BPC as an ISO certified company (ISO 9001:2015, ISO 14001:2015, ISO 45001:2018) recognizes the importance of conducting business operations in an environmentally responsible and sustainable manner. BPC is committed to health and safety of its staff, business partners and contractors, innovation and service excellence, and supporting the communities in which we work.

2.2 Project Overview

With the upcoming Norbugang Industrial Park in the offing, the Ministry of Industry, Commerce & Employment (MoICE) has directed BPC to initiate the construction of power infrastructure. Therefore, as part of this the 220kV D/C (LILO) Transmission Line construction is underway.

2.3 Site Description

The 220kV D/C (LILO) Transmission Line is located at Samtse and Norbugang gewogs under Samtse Dzongkhag. The transmission line is mostly aligned with the existing 66kV D/C Samtse-Sipsoo transmission line along the Primary National Highway (PNH) between Samtse and Sipsoo. The total project area is approximately 55.17 acres.

2.4 General Environmental Terms & Conditions

The terms and conditions set below are subject to changes after the issuance of the actual EC for the proposed project. This section of the EMP shall be revised in accordance with the EC issued from the DECC.

Sl No	Condition	Relevant Section of the EMP
I. General		
1.	Comply with provisions of the National Environment Protection Act 2007, Environmental Assessment Act 2000 and its Regulation 2016, Waste Prevention & Management Act of Bhutan 2009 and its Regulation 2012 (Amendment 2016), The Water Act of Bhutan 2011 and its Regulations 2014.	Section 5: Legal and other requirements
2.	Ensure that the activity is in line with Initial Environmental Examination Report submitted for EC.	Section 8: Significant Environmental and Social Impacts

3.	Ensure that local communities, properties and any religious, cultural, historic and ecologically important sites are not adversely affected by the activity.	Section 8.4 and Section 8.6
4.	Restore the damage of any public or private properties caused by the activity.	Section 10.2
5.	Inform DECC and any other relevant authorities of any unanticipated or unforeseen chance-find of any precious metals or minerals or articles that have economic, cultural, religious, archaeological, and/or ecological importance.	Section 8.6
6.	Erect a signboard at the main entry of the activity stating the name of the project and contact address.	
II. Environmental Standards		
	The holder shall comply with existing environmental standards.	Section 8.1, 8.2 and 8.7
III. Import and Use of Second-hand equipment		
1.	The holder shall not import and use second-hand equipment and machineries.	Section 8.1, 8.2
2.	Ensure that import and use of ODS are in line with the Revised Regulation on the Control of ODS 2008.	Section 8.1, 8.2
IV. Water use and management		
1.	The holder shall ensure that activity does not disrupt the water flow and pollute the water bodies.	Section 8.3, 8.7 and 8.8

2.	Ensure that 30 meter or 100 feet buffer is maintained from the water sources at all times.	Section 8.7 and 8.8
V. Waste Prevention and Management		
1.	Manage wastes generated from the project (project site, labour camps, offices etc.) with the application of 4R (Reduce, Reuse, Recycle, Responsibility) principle and other environmentally friendly methods of waste management.	Section 8.8
2.	Dispose excess excavated materials generated during construction activity at the pre-identified approved dumpsite.	Section 8.8
3.	Ensure that import and use of hazardous wastes are strictly prohibited.	Section 8.10
VI. Implementation Plan		
	The holder shall prepare a detailed implementation plan focusing on the implementation of terms and conditions of this EC and submit to DECC with three (03) months from the date of issue of this EC as per the reporting format attached.	
VII. Monitoring and Reporting		
1.	Ensure that the effective day-to-day monitoring of the EC terms and conditions are carried out by the environmental unit or designated environment focal person.	Section 9.4 and 9.5
2.	Maintain proper records on wastes generated and its management, stating types, quantities and characteristic, and submit to DECC annually.	Section 9.6 and 10.3

2.5 Contractual Obligations

The Contractor will ensure that the following requirements are adhered to in accordance with the Contract:

• Compliance with all conditions of approval relevant to the Project;

• Suitably qualified environmental resources will be provided to undertake environmental duties relevant to the Project, including the implementation of the EMP as required;

• Mechanisms will be established and implemented to ensure continual improvement; and

• Compliance with any reasonable direction given by a competent Authority or BPC representative to improve or rectify the Project's environmental practices is adhered to.

3. Scope of Works (construction)

The works include but are not limited to the following;

- Construction of tower locations AP01 to AP23 under Samtse and Norbugang Gewogs, and
- Construction of access roads to transport construction materials to site.

4. Environmental Policies

4.1 BPC Environmental Policy

BPC is committed to the practice of sound environmental stewardship; and strive to protect and conserve our natural environment, and prevent all forms of ecological degradation for the benefit of the present and the future generations as enshrined in the Constitution of the Kingdom of Bhutan. These values resonate with our company's vision and Core Values accentuating through all levels of responsibility within the organization.

BPC shall demonstrate our commitment through the following actions:

- Meet applicable legal obligations and ensure the same standard of compliance from our contractors and suppliers.
- Integrating environmental and social risk assessment into decision making and operational activities.
- Institutionalize environmental stewardship through job responsibilities, encouraging volunteerism and adopting the 3 Rs (Reduce, Reuse & Recycle) practice amongst employees.
- Communicating with stakeholders on environmental issues in a transparent and timely manner.
- Provide education and training about environmental risks, responsibilities and initiatives to our employees that may affect their work.

- Develop, implement and maintain workable environmental management system, to ensure BPC continues to meet its environmental objectives and goals in line with BPC's Integrated Management System (IMS) Manual.
- Continually improving environmental performance through operational efficiencies, engineering improvements and systems development.

5. Legal and Other Requirements

The Project shall be delivered in compliance with all applicable Acts and Regulations relevant to the scope of works. A General Register of legal and other requirements for this Project is contained in the table below. This register will be reviewed at regular intervals e.g. during management reviews and updated with any applicable changes. Any changes to the legal requirements register will be communicated to the wider team where necessary through toolbox talks, specific training and other communication methods.

Regulatory and Other Requirements	Description and Relevance
Environmental Assessment Act 2000	This Act establishes procedures for the assessment of potential effect of strategic plans, policies, programs and projects on the environment and all projects in Bhutan are assessed as per the provisions of this Act.
National Environment Protection Act 2007	This Act provide for the establishment of an effective system to conserve and protect environment through the National Environment Commission, competent authorities and advisory committees, so as to independently regulate and promote sustainable development in an equitable manner.
Land Act 2007	The umbrella act pertaining to all land in the country.
The Land Rules and Regulations of the Kingdom of Bhutan 2007	This Regulation establish procedures to implement the purpose of the Land Act 2007.
Waste Prevention and Management Act of Bhutan 2009	This Act protect and sustain human health through protection of the environment by reducing generation of waste at source;

	promoting the segregation, reuse and recycling of wastes; disposal of waste in an environmentally sound manner and; effective functioning and coordination among implementing agencies.
The Water Act of Bhutan 2011	The purpose of this act is to ensure that the water resources are protected, conserved and/or managed in an economically efficient, socially equitable and environmentally sustainable manner and; To establish suitable institutions.
Waste Prevention and Management Regulation 2012 and its Amendment 2016	This Regulation establish procedures to implement the purpose of the Waste Prevention and Management Act 2009.
Water Regulation of Bhutan 2014	This Regulation is promulgated to enforce the objectives and purpose of the Water Act.
Regulation for Environmental Clearance of Projects 2016	This Regulation defines responsibilities and procedures for the implementation of the Environmental Assessment Act 2000 concerning environmental assessment process for projects.

6. Structure and Responsibilities

The project specific organisational structure is provided below. All BPC personnel (including the Contractor) have a general environmental right and duty as defined in the National Environment Protection Act 2007 and are responsible for their own environmental performance whilst on site.

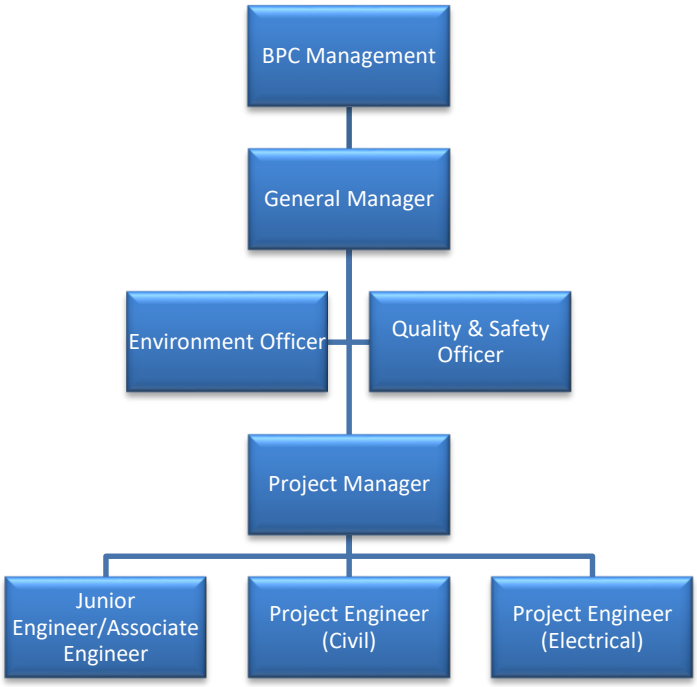

Figure 1: General Organogram of the Project Team

Role	Responsibilities
Project Manager	○ Promote Environmental performance, at every opportunity as a core value of the organisation. ○ Ensure there is adequate and efficient resources available ○ Be familiar with, understand, and enforce the legislative duties and project specific regulations and requirements, as well as other pertinent and accepted work practices; ○ Exercise stop work responsibility when Environmental Aspects present themselves ○ Work closely with and support the Project Engineers for the execution of this Strategy.
Environment Officer and Quality & Safety Officer	○ Reporting of Environmental Issues as required to the General Manager and Manager, CMS ○ Development of this EMP and revisions. ○ Ensuring that all project personnel receive appropriate environmental inductions and additional training as required; ○ Ensure that relevant Audit tools and schedules are developed and adhered to. ○ Monitoring of performance of this EMP.

	○ Maintenance of up-to-date EMP and relevant documents at the site.
Project Engineers and Junior Engineers	○ Support the Project Manager to ensure project environmental management and due diligence, ○ Assist in allocation of resources; Ensuring that all site personnel receive appropriate environmental inductions and additional training as required, ○ Reporting on this EMP, ○ Promote environmental incident avoidance, ○ Respond to environmental incidents, ○ Corrective and preventative action, ○ Emergency preparedness and response, ○ Approval of any chemicals entering the site, ○ Emergency response manager, ○ Compliance with permits, local council guidelines and regulatory Requirements, and ○ Monitoring of Contractor compliance with the EMP.
Contractor	○ Contractor shall be required to comply with the specific terms of the Contract, performance objectives of the contract, and EMP, ○ Submit an applicable Environmental Management Plan to BPC for review and approval before the commencement of any work on-site, ○ Participate in the implementation of this EMP and their own EMP, ○ Work with site supervisors to ensure their activities are undertaken in a manner which does not cause environmental harm, ○ Rectify environmental controls removed or damaged by their activities; and ○ Report situations that have, or may result in environmental harm.
All On-Site Personnel	○ Report any activity that has resulted in, or has the potential to result in an environmental incident immediately to the Project Engineer and Project Manager; ○ Where necessary, ensuring environmental inspections are undertaken and any environmental records are kept, ○ Carry out all activities in accordance with this EMP, ○ Identify and report non-conformances, ○ Implement corrective and preventative action, and

	○ Work with the project team in planning and implementing environmental requirements.

6.1 Contractor Structure and Responsibilities

The Contractor must ensure that the following roles are established and the corresponding responsibilities are fulfilled;

Project manager

The Project manager will be responsible for:

- Ensuring all relevant requirements are in place,
- Establishing a rigid management and reporting structure to implement and monitor these requirements,
- Ensuring compliance with this Management Plan.

Environmental Management representative

The Environmental Management representative will be responsible for:

- Aiding and giving advice to the Contractor in order for this EMP to be implemented properly,
- Carrying out inspections, monitoring each condition and reporting any findings,
- Providing project-wide advice to ensure consistent approach and outcomes are achieved, including communication between the Contractors where required by Environmental Management Plans and/or Development Consent conditions, and
- Liaising with the DECC and contacting the relevant Agencies where required by legislations as listed in this EMP.

7. Environmental Risk Assessment

Environmental aspects as referred to in this document are those activities associated with the Project that have the potential to cause, or result in, environmental harm.

An environmental risk management assessment has been utilized to identify and assess the environmental aspects associated with the Project, and to recommend appropriate mitigation measures to minimize the likelihood of environmental risks associated with each aspect to be included in an Environmental Management Plan where required. This process involves:

• Identifying the risk/aspect,

• Analyzing the risk/aspect (determining likelihood and consequence),

• Evaluating the risk/aspect, and

• Treating the risk.

RISK MATRIX					
Severity	**Exposure**				
	E - Remote	D - Unlikely	C - Possible	B - Likely	A - Certain
1 - Slight	1	1	1	2	3
2 - Minor	1	2	2	3	3
3 - Moderate	1	2	3	4	4
4 - Major	2	3	4	5	5
5 - Extreme	3	3	4	5	5

EXPOSURE – How likely is this event to happen?		
CODE	**DESCRIPTION**	**DEFINITION**
A	**Certain**	Is expected to occur in most circumstances
B	**Likely**	Will probably occur in most circumstances
C	**Possible**	Might possibly occur some times
D	**Unlikely**	Could occur at some time but doubtful
E	**Remote**	May occur but only in exceptional circumstances
SEVERITY- if this does happen, how severe would the outcome be?		
CODE	**DESCRIPTION**	**DEFINITION**
5	**Extreme**	Fatality/ multiple serious injuries, environmental disaster, huge cost
4	**Major**	Serious/life threatening injury, severe environmental damage, major cost
3	**Moderate**	Injury requiring medical treatment, contained environmental impact, moderate cost
2	**Minor**	First aid treatment, some environmental/financial impact
1	**Slight**	No injury, low environmental/financial impact
Risk Level Code	**DESCRIPTION**	**ACTIONS**
5	EXTREME	**Do not undertake task.** Modify process / design.
4	VERY HIGH	**Do not undertake task.** Modify process / design, Action plan required including controls to manage risk. Requires senior management attention.
3	HIGH	Action plan required including controls to manage risk. Requires senior management attention
2	MEDIUM	Specify management responsibility

1	LOW	Manage by routine procedures

8. Significant Environmental and Social Impacts

Using the above Risk Assessment, the significant environmental impacts have been listed below, with a summary of control/mitigation measures to be implemented and monitored.

All environmental mitigation shall be communicated through Site Induction. Relevant Audit Tools in relevance to the IMS Manual of BPC will also be developed in accordance with the performance objectives below and the mitigation measures outlined in the relevant EMP.

8.1 Air Quality

Issues

The most common pollution generating sources in the area include vehicle emissions and dust from the adjacent farm road. Emissions to the atmosphere from the Project during construction will be temporary, and restricted to dust caused by land disturbance, and vehicle, plant and equipment exhaust emissions. Dust emissions during operation are not expected to be significant.

Environmental Performance Objectives

- Minimal dust moving off-site and minimum dust on-site,
- No complaints from neighbouring properties,
- Construction equipment operating according to manufacturer's specifications, and
- Compliance with the relevant regulation.
- Compliance with Condition 1-3 of the Environmental Clearance.

Mitigation Measures

Action	Responsibility	Timing
Water Trucks to be used during construction for dust suppression as required for: 1. Internal unsealed access roads and 2. Disturbed areas 3. At least twice in a day (F/N and A/N)	Contractor	When Required
Dust suppression requirements during construction will take into consideration weather conditions and the likelihood of extended dry periods.	Contractor	When Required

Ensure all construction related stockpiles are covered or regularly watered to prevent dust emissions.	Contractor	When Required
Minimize surface disturbance and maintain surface cover where possible.	Contractor	Always
Confine traffic to defined roads and tracks on-site where possible.	Contractor	Always
Confine traffic to defined roads and tracks on-site where possible.	All Personnel	Always
Dust generating activities shall be limited during periods of high velocity wind, as determined by the Project Engineer in consultation with the Environment, Quality & Safety Officers and Contractor Representatives.	Project Manager	When Required
Visual monitoring for dust resulting from construction activities shall be undertaken by all personnel. Excessive dust generation shall be reported to the Contractor Supervisor or Project Manager.	All Personnel	When Required
All dust complaints from construction activities shall be recorded and reported to the Project Manager or Environment/Quality & Safety Officers immediately after receipt of the complaint. All actions taken are to be recorded.	Environment Officer	When Required
All trucks transporting spoil and fill material to and from the site shall have covered loads if travelling on public roads.	Contractor	Always
All trucks, plant and temporary equipment used on site shall be regularly serviced such that they operate efficiently and do not emit excessive exhaust.	Contractor	Always
Visual monitoring shall be conducted and maintenance records of all trucks, plant and machinery are to be kept.	Contractor	Always
All vehicles, plant and equipment will be cleaned on a regular basis.	Contractor	When Required
All vehicles, plant and equipment will be switched off when not in continuous use.	Contractor	Always
Burning of vegetation or other waste materials is not permitted.	All Personnel	At all times

8.2 Noise and Vibration

Issues

A Noise Impact Assessment (NIA) has been undertaken to assess the potential construction, operational and traffic noise impacts associated with the project.

- The results of the noise assessment determined that:
- No exceedances of the highly affected noise limit of 75 dB (A) are predicted during construction;
- No exceedances of Vehicular Noise Level Limits are predicted for traffic generated by the development.

Environmental Performance Objectives

- Construction activities will only occur between site specified hours,
- Construction noise from the project is minimised,
- Maintain compliance with the conditions of the project approval and legislation relating to noise,
- Provide a protocol for monitoring and assessing construction noise impacts on surrounding private receptors,
- Effective communication with the local community and regulators regarding construction of the proposed project, and
- Compliance with Section II and III of the Environmental Clearance.

Mitigation Measures

Action	Responsibility	Timing
Contact details provided to all surrounding residences so as they can directly contact a Contractor Representative (Liaison Person) on-site if they have any issues with noise generated during the project. All Complaints will also be reported through to BPC.	Contractor	Project Duration
Construction activities will only occur between site specified hours: - Monday - Sunday: 6am-7pm If noise limits are exceeded or a compliant is received, BPC will implement appropriate control measures to resolve the compliant or ensure compliance with the limits.	Project Manager and Contractor	Project Duration
Construction site personnel shall be made aware of all community attitudes and noise complaints through toolbox talks and awareness training sessions.	Project Manager	When Required
All vehicles and equipment shall be turned off when not in use.	Contractor	Always

All construction equipment shall be fitted with noise suppression devices (e.g. mufflers) and be kept in good working condition.	Contractor	Project Duration
Regular maintenance of plant and construction equipment shall be conducted to ensure items are kept in good working order.	Contractor	Project Duration
All noise complaints from construction activities shall be recorded and reported to the Project Manager, immediately after receipt of the complaint. All actions taken are to be recorded and will be developed on a case by case basis.	Environment, Quality & Safety Officer	When Required

8.3 Traffic and Transport

Issues

A Traffic Impact Assessment (TIA) has been prepared to assess the impact of the development on the performance of the surrounding road network. The TIA for this proposal considered impacts associated with increased traffic generation, site access, parking, intersection performance, and safety. The main issue to be managed throughout the project is the increased traffic volumes on Primary National Highway and Farm Road.

Environmental Performance Objectives

- Prepare a traffic management plan including routes, haulage limits and vehicle types and ensure effective implementation.

Mitigation Measures

Action	Responsibility	Timing
Notification to local personnel (community and Neighbours) regarding traffic and transport would be undertaken if any of the following were to change: 1. Road closures, 2. Parking, and 3. speed limit change	Project Manager/Contractor	Prior to commencement of Construction and as required throughout construction.
Prepare an on-site traffic management plan outlining; • Traffic Flow • Speed Limits	Contractor	Project Duration

• Access and Egress • Parking • Emergency Access		

8.4 Visual Amenity

Issues

The existing landscape character is dominated by a rural setting with sparse settlement. The majority of views to the proposal area were found to have minimal impact.

Environmental Performance Objectives

The design principles of the development seek to avoid, reduce and where possible, remedy adverse effects on the environment through the implementation of mitigation measures, which propose a combination of primary mitigation measures such as boundary tree planting and landscaping and temporary screening of construction activities.

Mitigation Measures

Action	Responsibility	Timing
Avoid un-necessary loss or damage to vegetation adjacent to the site and within the site by protecting trees prior to construction and/or trimming vegetation to avoid total removal.	Project Manager	Prior to commencement of Construction
Minimize light spill from development by ensuring the site is not over-lit and by properly directing construction lighting	Contractor	Project Duration
The construction site is to be kept tidy and well maintained, including removal of all rubbish at regular intervals. There shall be no storage of material beyond the construction boundaries.	Contractor	At all times
Worksite compound and site sheds are positioned away from visually sensitive areas and appropriate screening will be installed as required.	Contractor	Prior to commencement of Construction

8.5 Biodiversity

Issues

The proposed construction of 220kV D/C Transmission Line including access roads may result in both direct and indirect impacts on biodiversity. The direct impacts of the project are expected to comprise:

- The removal of up to 55 acres of native vegetation within the development site,
- Permanent land use change

The indirect impacts of the project potentially may include:

- Erosion of disturbed areas leading to sedimentation affecting any downgradient habitat or habitat within drainage channels,
- Water quality impacts (e.g. increased turbidity and suspended solids) affecting any downgradient habitat or habitat within drainage channels,
- Disturbance of fauna during construction due to noise generated by vehicles, equipment and construction activities.

Environmental Performance Objectives

- Minimise clearing and avoid unnecessary disturbance of vegetation that is associated with the construction and operation of the development
- Minimise the impacts to fauna on site (including fauna interaction with perimeter fencing)
- Rehabilitate and revegetate temporary disturbance areas
- Protect vegetation and fauna habitat outside the approved disturbance areas
- Maximise the salvage of vegetative and soil resources within the approved disturbance area for beneficial reuse in the enhancement or the rehabilitation of the site,
- Control weeds and feral pests.

Mitigation Measures

Action	Responsibility	Timing
To minimise vegetation removal, site access for construction and operation will be from the farm road only	All Personnel	Project Duration
Access roads within the project site will be located, where possible, along existing tracks currently used.	Contractor	Prior to commencement of Construction
Where appropriate native vegetation cleared from the project site will be mulched for re-use on the site to stabilise bare ground or used in landscaping areas.	Contractor	During Clearing
Any injured animals are to receive veterinary attention immediately.	Forestry Officials	Prior to clearing
Vegetation to be cleared shall be restricted to that required for the construction of the Project	Project Manager	Project Duration

including access roads. No vegetation outside the disturbance approval area shall be cleared.		

8.6 Cultural Heritage

Issues

No cultural sites were identified during the visual inspection of the Project area and it has been concluded that it is unlikely that unidentified cultural objects are present in the Project area.

Environmental Performance Objectives

- In case of any unanticipated or unforeseen chance-find of any precious metals or minerals or articles that have economic, cultural, religious, archaeological, and/or ecological importance, cease work and inform DECC.
- Compliance with Section I, Clause no. 5 of the Environmental Clearance.

Mitigation Measures

Action	Responsibility	Timing
In the event of suspected cultural heritage items or precious metals being identified on site, all works within the immediate area of the find will cease and the area made secure to enable inspection and sampling of the site. Any unexpected finds are to be reported immediately to BPC.	All Personnel	When Required
If suspected cultural heritage items are identified the DECC must be notified.	Environment Officer	When Required
In the unlikely event that skeletal remains are identified, work must cease immediately in the vicinity of the remains and the areas made secure. BPC must then contact the local Police who will make the initial assessment as to whether the remains are a part of crime scene or not.	Project Manager	When Required
If suspected archaeological resources are identified, work within the affected area must cease and the area secured. The DECC must be informed.	Environment Officer	When Required

8.7 Soil and Water Quality

Issues

A Surface and Groundwater Assessment has been undertaken to assess the impact of the proposed development on the surface and groundwater resources in the locality, including surrounding water users and Groundwater Dependant Ecosystems (GDE's).

The development is anticipated to have minimal impacts on the surrounding surface water environment, flow regimes (flooding), quality, quantity, features, or local or regional hydrology. Although some of the possible impacts will include: -

- Contamination from sediment and unintended spillages of fuel, lubricants, herbicides, sewage and other chemicals
- Increased soil compaction through additional access tracks and other hardstand areas changing runoff characteristics and potential for concentrated flows
- Increased imperviousness of the site through installation of solar panels

Environmental Performance Objectives

To ensure that impacts are minimised an Erosion, Sediment and Storm water Control Plan will be implemented, along with various site management protocols not limited to the below mitigation measures: -

Compliance with section IV of the Environmental Clearance.

Mitigation Measures

Action	Responsibility	Timing
Development and implementation of a Construction and Operational Erosion and Sediment Control Plan.	Environment Officer	Prior to commencement of Construction
Consultation with adjacent landholders shall be ongoing to manage interaction between the project and other properties.	Project Manager	Project Duration
Erosion and sediment controls shall be installed progressively during site works.	Contractor	Project Duration
Erosion and sediment controls will be visually inspected as part of the Environmental Audit schedule. During periods of rainfall causing runoff a compulsory inspection protocol will be implemented.	Environment, Quality & Safety Officers	Project Duration
Regular equipment cleaning of equipment shall be completed to minimise the tracking of sediment from vehicles, plant and equipment onto the farm road and the PNH.	Contractor	Project Duration
Stockpile topsoil appropriately to minimise weed infestation and maintain soil organic matter, soil structure and microbial activity.	Contractor	Project Duration

Minimise surface disturbance and maintain surface cover where possible.	Contractor	Project Duration
Where possible, construction works should be staged in a manner that minimises the duration and extent of exposed soils and sub-soils.	Contractor	Project Duration
Refuelling of plant and machinery to be done at least 50m away from water bodies and constructed drainage lines in an impervious bunded area.	Contractor	Project Duration
All fuels, chemicals and other potential contaminants to be storage at least 50m from water bodies and constructed drainage lines in an impervious bunded area.	Contractor	Project Duration
Grass cover to be established and/or maintained under all solar panel arrays to maximise water infiltration whilst balancing risk of fire from build-up of combustible vegetation.	Contractor	Project Duration
All solid and liquid waste to be appropriately stored in containers awaiting collection and disposal to approved facilities off site.	Contractor	Project Duration
All machinery and plant to be checked daily to ensure no leakage of fuels, lubricants or other liquids.	Contractor	Project Duration
All staff to be appropriately trained through toolbox talks for the minimisation and management of unintended spills.	Environment, Quality & Safety Officers	Project Duration

8.8 Waste Management

Issues

There will be various waste streams from the construction phase of the project including the following: -

- Workforce general waste,
- Packaging materials (i.e. cardboard, plastic, timber pallets, metal strapping),
- Excess building materials,
- Scrap metal and cabling materials (i.e. steel, aluminium, copper),
- Plastic and masonry products,

- Waste concrete products,

- Excavation of top soils and scalping of vegetation, and

- Temporary ablutions waste.

Environmental Performance Objectives

Waste management for the development will be undertaken consistent with the waste management hierarchy in the following order of priority from most desirable to least desirable:

- Avoid: Waste avoidance by reducing the quantity of waste being generated. This is the simplest and most cost-effective way to minimise waste. It is the most preferred option in the waste management hierarchy.

- Re-use: Reuse occurs when a product is used again for the same or similar use with no reprocessing. Reusing a product more than once in its original form reduces the waste generated and the energy consumed, which would have been required to recycle.

- Recycle: Recycling involves processing waste into a similar non-waste product consuming less energy than production from raw materials. Recycling spares the environment from further degradation, saves landfill space and saves resources.

- Dispose: Removing waste from worksites and dumping on a landfill site, or other appropriately licensed collection centres.

Waste generated from the construction and operation of the proposed facility will be managed efficiently to ensure that the diversion of waste from landfill is maximised.

Compliance with the Section V of the Environmental Clearance.

Mitigation Measures

Action	Responsibility	Timing
Waste materials, including spoil and construction wastes, should be separated onsite into dedicated bins/areas where practicable, for either reuse onsite, to be recycled or disposed of in an appropriate manner at designated areas/facilities. Local commercial reuse opportunities will be investigated where reuse on-site is not practical.	Contractor	Project Duration

Waste storage facilities and spoil placement areas shall be located in easily accessible locations, away from existing drainage lines.	Project Manager	Project Duration
Watercourse, site drains and waterbodies shall not be polluted by waste.	All Personnel	Project Duration
Green waste shall be mulched and reused onsite for landscaping and rehabilitation if appropriate.	Contractor	When required during clearing
The waste storage area shall be of adequate capacity to handle the volumes of waste being stored without posing a risk to the environment.	Contractor	Project Duration
Ordering will be limited to only the required amount of materials.	Contractor	Project Duration
No litter to be left onsite. All work areas to be tidied each day.	All Personnel	Project Duration
Lids and seals shall be maintained on all odour generating waste material; and all domestic and food scrap waste shall be secured to prevent wildlife access.	All Personnel	Project Duration
No waste is to be burned or buried on site.	All Personnel	Project Duration
All sewage waste generated on site shall be collected and pumped out as necessary for offsite disposal to an appropriately licensed facility.	Contractor	Project Duration
Inspections of the waste storage area and facilities shall be conducted, as part of the scheduled environmental inspection. Inspections shall include; • Ensuring the waste material is being properly separated, stored and labelled, • Checking the condition of the receptacles and secondary containment systems, • Ensuring the spill kits are available and full, and PPE is available where required.	Environment Officer	Project Duration
The Site Induction & toolbox training shall include information on the following waste management issues: • Reuse and recycling strategies, • Waste handling, waste storage and disposal, and	Environment Officer	Project Duration

• Management of waste spills, contamination and contaminated material.		

8.9 Socio-Economic

Issues

The key potential social and economic impacts that may result from construction of the proposed development include:

- Increased employment – there is the potential for employment to be generated during the construction phase through the use of local contractors and labour hire,
- Increased traffic on local roads and hazards associated with construction traffic,
- Influx of workers putting pressure on local accommodation and health services, and
- Short term air quality, noise and visual impacts.

Environmental Performance Objectives

- Providing regular Project updates to the community and businesses,
- Providing a schedule of activities when there may be heavy vehicles accessing the Project site or when noisy activities may occur,
- Establishment of a grievance redressal mechanism for complaints,
- Ongoing liaison with local community and business representatives to ensure the use of local contractors, labour, materials, and services during construction and operations,
- Liaison with local businesses and services to determine accommodation options and availability so as local tourism is not affected, particularly during the construction phase,

Mitigation Measures

Action	Responsibility	Timing
Ongoing liaison with local community and business representatives to ensure the use of local contractors, labour, materials, and services during construction and operations.	Contractor	Project Duration
Liaison with local businesses and services to determine accommodation options and availability so as local tourism is not affected, particularly during the construction phase.	Project Manager	Project Duration
Establishment of a grievance redressal mechanism for complaints.	Environment Officer	Project Duration

8.10 Dangerous goods and Hazardous Materials

Mitigation Measures

Action	Responsibility	Timing
A Safety Data Sheet (SDS) for each dangerous good and hazardous substance used on site shall be available on site and will be located near the place of use.	Contractor	As required
A register shall be kept on site of all hazardous materials and dangerous goods used on site.	Contractor	Project Duration
All personnel involved in the handling of hazardous materials shall be suitably qualified / experienced. Additional toolbox training on the properties, hazards, maintenance and PPE associated with hazardous substances shall be provided where required.	Environment Officer	When Required
Spill kits shall be provided in all dangerous goods and hazardous materials storage and handling areas. All key staff shall be trained in spills prevention and clean up.	Contractor	Project Duration
Storage and handling areas shall be located >50m from any waterways and be constructed in accordance with the relevant Standards, including secondary containment impervious to the materials being stored and appropriate signage at the entrance to the storage area.	Contractor	Project Duration
Secondary containment systems (e.g. bunding, drip trays, etc.) shall be: • In place for all hazardous and dangerous goods storage, transfer and refuelling areas. • Constructed from material that is impervious to the material being stored or transferred • Designed and constructed to minimise the risk of leakage, spillage or contaminated fire water from contaminating the surrounding soil.	Contractor	Project Duration
All vehicles and plant shall be sent offsite for major maintenance.	Contractor	Project Duration
Regular inspections shall be undertaken to ensure the structural integrity of storage facilities and secondary containment systems. These inspections shall occur as part of the scheduled site environmental inspections.	Environment, Quality & Safety Officer	Project Duration
All equipment and vehicle operators shall be trained in the safe operation of the equipment (including operating procedures for the refilling	Contractor	When Required

and maintenance of fuel storage tanks) and the relevant emergency response procedures.		
In the event of any spill or leak to the environment, action shall be taken immediately to contain the spill, and the spill response procedures initiated.	Contractor	When Required
Where any spill to the environment has occurred regardless of scale, BPC shall be notified immediately.	Contractor	When Required

9. Implementation

9.1 Training and Awareness

All BPC personnel and/or the contractor shall be formally inducted and provided with specific awareness training in relation to the environmental aspects and mitigation methods outlined above, as they apply to each activity.

9.2 Site Induction

Prior to commencing works on site, all personnel shall undertake a site-specific induction addressing the environmental management risks and requirements for the construction of the Project. The environmental induction shall include as a minimum:

- The relevant environmental legislation,
- General environmental duties,
- Conditions of the relevant licenses and approvals,
- The environmental aspects and mitigation strategies provided in section 8 above,
- Definitions and management of environmental incidents.

9.3 Toolbox Training

Toolbox training shall be conducted on a weekly basis and shall include environmental risks and responsibilities where required. The Environment/Quality & Safety Officer may from time to time provide additional toolbox topic training materials or require environmental stand-down toolbox training to occur in response to specific high-risk issues identified on the project.

9.4 Daily Site Inspections and Surveillance

Inspections and surveillance of construction and upgrading activities will be undertaken on a day-to-day basis. These inspections will not be documented unless significant non-conformances with the EMP are identified.

9.5 Quarterly Site Environmental Inspection

The effectiveness of environmental mitigation measures outlined in section 8 of the EMP will be assessed quarterly by the Project Manager, Environment Officer, Quality & Safety Officer or a nominated delegate, unless otherwise specified. A site environmental inspection

checklist will be developed addressing the key environmental impacts and mitigation measures which have the potential to arise during construction activities.

Actions identified in quarterly inspections are to be closed out prior to the subsequent inspection, in accordance with the allocated action priority report. However, in certain circumstances only and upon consultation with the Project Manager, an extended timeline to close out particular actions may be established.

9.6 Environmental Records

The Environment Officer will maintain the following records:

- The EMP and associated procedures,
- Relevant approvals, regulatory licenses and permits,
- Inspection records and checklists,
- Environmental monitoring results,
- Environmental accident/incident/emergency reports,
- Non-conformance documentation,
- Environmental complaint reports,
- Waste reports,
- Audit reports, and
- Management review minutes and action taken.

10. Emergency Planning and Response

Environmental management will include planning for potential emergencies at the site. The organizational structure, responsibilities and on-site contact details for all emergencies is specified in the Emergency Management Plan.

Emergency response documents, and the contact details of all relevant stakeholders, will be housed at the Project site office and displayed on site. The procedure for environmental emergencies shall also form part of the project Safety and Health Management Plan.

All personnel will receive training in appropriate Emergency Response Procedures associated with the ERP as part of the site induction.

10.1 Environmental Incident Levels

Environmental Incidents/Non-Conformances is classified into three levels as detailed below:

Level 3 – Major	Level 2 – Major	Level 1 - Minor
Level 3 Environmental Incidents create permanent or long term	Level 2 Environmental Incidents create short to medium term damage to	Level 1 Environmental Incidents typically cause short term or nuisance

damage to the environment. This damage will result in the environment taking 12 months or more to return to pre-existing conditions.	the environment. This damage will result in the environment taking up to 12 months to return to pre-existing conditions	damage. The damage is easily rectified usually within one day. Level 1 incidents do not cause medium or long term damage.
Parameters		
Serious or material environmental harm or damage. • A criminal penalty of imprisonment ranging from one month to one year may be applied in addition to cost of the environmental damages.	Potential or actual material environmental harm or damage reportable as per Regulations and Act • A criminal penalty of imprisonment ranging from one month to one year may be applied in addition to cost of the environmental damages.	Environmental Pollution • Payment of fine ranging in amount from one to twelve man-months of the minimum National Wage Rate. • Order to take mitigating, corrective or restorative measures as maybe deemed necessary to prevent further damage being caused to human health and/or the environment.
Examples		
Sediment basin/containment pond fails Spreading fire ants/electric ants/crazy ants outside of the restricted area Breaking an Environmental Protection Order / Notice / Licence conditions Wilful discharge or disposal of contaminated materials/liquids off site or waterways	Damage to cultural/heritage items, i.e. controlled discharge from concrete saw cutting. Complete failure of Erosion Sediment Controls where run off leaves the site. Wilful or negligent damage to Erosion Sediment Controls – conc. off site Working outside of hours nominated in the Development Consent Deliberate discharge of water outside of approved limits offsite, i.e. into storm	Oil Leak <=5 L, i.e. hydraulic oil leak Fuel leak/spill <=5 L, i.e. from refuelling equip. Chemical leak/spill <=5 L, i.e. curing compound radiator fluid. Sediment Control: - Damage or partial failure - Where run-off does not leave the site

Wilful damage/destruction to native vegetation Wilful damage/destruction of cultural/heritage artefacts or significant places	water Damage to external property as a result of construction vibration Any fuel/oil/chemical leaks/spills to waterways. Any fuel/oil/chemical spills contained on site 5 L – 1000 L Damage of loss to treated/vulnerable/ endangered species, i.e. protected by Legislation Litter leaving the site Overflow from on-site sewage collection tanks Disposal of waste at an non-designated areas: - Construction waste - Spoil material - Liquid waste Incorrect storage of regulated/contaminated or hazardous waste: - Oils - Contaminated material - Sewage - Asbestos	- Wilful or negligent damage to Erosion Sediment Controls Dust emission (remaining visible at 20 m from site – or visible at a sensitive receptor, whichever is less, e.g. dust settlement on surrounding properties.) Lights – unwanted illumination of neighbouring properties. Complaints – record all unless validated. Damage to vegetation to be retained/ protected Not covering loads on truck carrying material off site.

	Not having required licence permits or approvals Sediment/containment ponds breached Complaints relating to odour Transport and disposal of fire ant items outside of fire ant restricted area Supplying plant material containing pest plant reproductive material	

10.2 Environmental Incident Investigation and Close-out

For all incidents, an Incident Report shall be raised within BPC and Contractor, and for all Level 2 and 3 Incidents, a detailed Investigation Report will be completed using the Incident Reporting format.

Where a Level 3 Incident has occurred, the Sr. Manager, CMS will initiate the investigation and allocate responsibilities and an external consultant may be engaged. Legal privilege shall be established if required.

For all environmental incidents, the Project Manager/Client shall be notified immediately (within 2 hours of the incident occurring). The Contractor in consultation with BPC will make the determination to notify the relevant authority. The relevant site personnel shall work with the Project Manager/Client as required during incident investigation activities.

10.3 Reporting Incidents to Regulatory Authorities

Environmental harm

The DECC shall be notified immediately (without delay) of any incident causing or threatening material harm to the environmental. The Contractor is responsible for immediately notifying BPC as required of the nature and circumstance in which the event happened and seek direction as to the appropriate communication pathway for notifying the appropriate agencies.

Release of contaminants

Any release of contaminants must be reported to the appropriate regulatory body in accordance with the above protocol for environmental harm. Where a release involves storm water and has not, or will not, result in material environmental harm the incident shall be reported to the relevant local authority. The release shall be reported as soon as practicable, after becoming aware of the release.

A written notice detailing the following information must be provided to the relevant authority of any spill or release of contaminants:

- The name of the operator, including their registration certificate number,
- The name and telephone number of a designated contact person,
- Quantity and substance released,
- Person(s) involved,
- The location and time of the release,
- The suspected cause of the release,
- A description of the effects of the release,
- The results of any monitoring performed in relation to the release,
- Actions taken to mitigate any environmental harm caused by the release; and
- Proposed actions to prevent a recurrence of the release.

10.4 Complaints and Complaints Response

Complaints shall be registered, tracked and responded to in accordance with the following timeframes:

- Complaint made to the Project Management Team (BPC and Contractor)
- Initial response provided to the complainant and Client within 24 hours indicating the matter is being addressed; and
- Detailed response including details of the complaint and the action taken / further action planned to alleviate the problem provided to the client within ten working days.

The following details will be recorded as a minimum:

- Date,
- Issue / Complaint,
- Affected Neighbours,
- Activity Date,
- Follow up / complaints – Actions, and
- Follow up / complaints – date.

11. Reference

This Environment Management Plan has been prepared with specific reference to the Construction Environment Management Plan issued by the Signal Energy Australia Private Limited Firm in Australia.