WIND POWER PROJECT IN MAHARASHTRA STATE, INDIA

Document Prepared By: Baidyanath Power Private Limited

Project Title	Wind Power Project in Maharashtra State, India
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Table of Contents

1 PROJECT DETAILS

1.1 Summary Description of the Project

The Project Proponent, Mahalaxmi Commercial Services Private Limited, has proposed to develop a 10.5 MW wind power project at site-Jath, Taluka-Jath, District-Sangli, State-Maharashtra in India. M/s Baidyanath Power Private Limited (earlier owner was Mahalaxmi Commercial Services Private Limited. The Business Transfer Agreement is executed between Mahalaxmi Commercial Services Private Limited and Baidyanath Power Private Limited on 13th October 2015) is the new project proponent of the proposed project activity.

The project activity will generate electricity utilising wind energy and will supply the generated electricity to the regional MSEDCL grid which is under purview NEWNE grid. Net electricity supplied to the grid by project activity is measured on continuous basis with the 0.2s accuracy meters[1]. In absence of the project activity equivalent amount of electricity would have otherwise been generated by existing and new power plants connected to the emission intensive NEWNE electricity grid. Thus the project activity would result in avoidance of Green House Gases (GHGs) emission and contribute to mitigation of global warming.

Details of commissioning date of all WTGs:

Sl. No	Location	Capacity of WTG (MW)	Commissioning Date*
1	JTH- 247	2.1	08/06/2013
2	JTH- 292	2.1	08/06/2013
3	JTH- 293	2.1	08/06/2013
4	JTH- 294	2.1	11/02/2014
5	JTH- 300	2.1	11/02/2014

* Reference foot note no. 1 is applicable.

The Project Proponent has placed the purchase orders to Suzlon Energy Limited and its group companies to supply and install the proposed wind power project. Suzlon shall also provide operation and maintenance services to the project activity.

Purpose of the Project Activity:

- To utilize renewable wind energy for generation of the electricity.
- To sell the generated electricity to Maharashtra State Electricity Distribution Company Limited (MSEDCL).
- To contribute in mitigating the climate change.

Pre-project scenario:

In the absence of the project activity, the equivalent amount of electricity would have been generated from the connected / new power plants in the NEWNE grid, which are / will be

[1] Commissioning certificates is provided for meter accuracy class and commissioning dates of WTGs.

predominantly based on fossil fuels. The main emission source in the pre-project scenario is the power plants connected to the NEWNE grid and main greenhouse gas involved is CO_2.

Project scenario:

The project activity is a renewable source of power generation and would supply electricity to the NEWNE grid. The total planned capacity of the project activity is 10.5 MW. The project activity will use wind energy in producing electricity and no other input will be used, therefore, it will not produce any greenhouse gas emission during its lifetime.

Baseline scenario:

The baseline scenario is that the electricity delivered to the NEWNE grid by the project activity would have otherwise been generated by the operation of the grid-connected power plants and by the addition of new generation sources into the NEWNE grid. Hence, pre-project scenario and baseline scenario are the same.

Reduction of GHGs emissions due to the project activity:

The project activity essentially involves generation of electricity from wind energy. The employed WTGs use wind energy to produce electricity and do not use any other input-fuel for electricity generation. The operation of WTGs is emission free and no GHG emissions are produced during the lifetime of the project activity.

The project activity replaces anthropogenic emissions of greenhouse gases (GHGs) into the atmosphere, which is estimated to be approximately average 16,223 tonnes of CO_2e per year, by displacing the equivalent amount of electricity generation through the operation of existing fuel mix in the grid comprising mainly fossil fuel based power plants and future capacity expansion connected to the grid.

The WTGs installed in the project activity are connected to the NEWNE grid. Therefore, the emission factor associated with the NEWNE grid is used to evaluate baseline emissions for the project activity. The project boundary composed of the WTGs, transformer, the metering equipment, substation, and the NEWNE grid, which is used to transmit the generated electricity.

The project activity does not result in any greenhouse gas emissions and it is a clean source of electricity. The technology is a clean technology as there are no GHG emissions associated with the electricity generation. Technology is indigenous, available within the country, and environmentally safe and sound.

1.2 Sectoral Scope and Project Type

Project type: Renewable energy projects

Sectoral Scope: 1- Energy Industries (renewable/non-renewable sources).

Project category: D. Electricity generation for a system.

1.3 Project Proponent

Organization name	Baidyanath Power Private Limited (earlier PP "Mahalaxmi Commercial Services Private Limited")
Contact person	Shripad Moharil
Title	
Address	Baidyanath Bhawan, Great Nag Road, Nagpur- 440024
Telephone	-
Email	-

1.4 Other Entities Involved in the Project

Organization name	NA
Role in the project	NA
Contact person	NA
Title	NA
Address	NA
Telephone	NA
Email	NA

1.5 Project Start Date

The start date of the project activity is the earliest date of commissioning of the WTG involved in the project activity i.e. 08-06-2013.

1.6 Project Crediting Period

The crediting period of the project activity is for 10 years (fixed).

The crediting period from 08-06-2013 to 07-06-2023.

1.7 Project Scale and Estimated GHG Emission Reductions or Removals

The project does not falls under large scale category since the emission reductions are less than 300,000 tCO_2 e per annum

Project Scale	
Project	✓
Large project	

Year	Estimated GHG emission

	reductions or removals (tCO_2e)
Year 1	16,305
Year 2	16,305
Year 3	16,305
Year 4	16,305
Year 5	16,305
Year 6	16,305
Year 7	16,305
Year 8	16,305
Year 9	16,305
Year 10	15,489[2]
Total estimated ERs	162,234
Total number of crediting years	10
Average annual ERs	16,223

1.8 Description of the Project Activity

The capacity of the project activity is 10.50 MW, which is less than the maximum qualifying capacity of 15 MW for small scale activity. Hence, the project activity has been considered as a small scale CDM project activity and UNFCCC indicative simplified modalities and procedures are applied.

Technology

The use of wind energy to generate electricity involves the conversion of power contained in masses of moving air into rotating shaft power. The conversion process utilises aerodynamic forces (lift and/or drag) to produce a net positive turning moment on a shaft, resulting in the production of mechanical power which can be converted to electrical power.

The project activity involves WTGs made by Suzlon, model S88, rated capacity 2100 kW. The technical details of the WTGs are provided below:

Suzlon Megawatt Series (S88: 2.1 Mw)[3]:

S88-2.1 MW is designed for a medium wind speed regime. Its wind turbine concept is based on a robust design with pitch regulated blade operation, a 3-stage gearbox with 2100 kW rating and flexible coupling to the asynchronous induction generator. The Suzlon flexi-slip system provides

[2] Deration of 5% is considered from 11th year of operation which is in accordance with the Memorandum of information presented to board during board meeting on 26/12/2012.
[3] http://www.suzlon.com/pdf/S88%20product%20brochure.pdf

efficient control of the load and power control and the turbine operation is efficiently controlled by the Suzlon controller.

Operating Data	
Rated Power	2.1 MW
Cut-in wind speed	4 m/s
Rated wind speed	14 m/s
Cut-out wind speed	25 m/s
Hub Height	79 m
Wind Class	IEC-IIA
Rotational speed	15 to 17.6 rpm
Rotor	
Pitch system	Pitch regulated, electrical
Diameter	88 m
Swept Area	6,082 m2
Blade material type	Epoxy bundled fibre glass
Generator	
Type	Asynchronous slip ring type induction generator
Rated Power	2,100 kW
Rated Voltage	690 / 600 V
Frequency	50/60 Hz
Protection	IP 54, IP 23 for slip ring unit
Cooling system	Air cooled
Insulation	Class H
Slip control	Unique Flexi-Slip providing slip up to 16.67%
Braking System	
Aerodynamic brake	3 Independent systems with blade pitching mechanism
Mechanical brake	Hydraulic fail-safe disc brake system
Gear box	
Type	3 stage (1 planetary and 2 helical)
Ratio	1:98.8/1:118.1
Nominal load	2,200 kW
Yaw system	
Type	Driven by 3 electrical driven planetary drives
Bearings	Polyamide slide
Certifications	
Design standards	GL 2003
Quality	ISO 9001:2000, ISO 9001:2008, ISO 14001:2004 & OHSAS 18001:2007
Tower	
Type	Tubular Tower (4 sections)
Corrosion Protection	Epoxy/PU coated

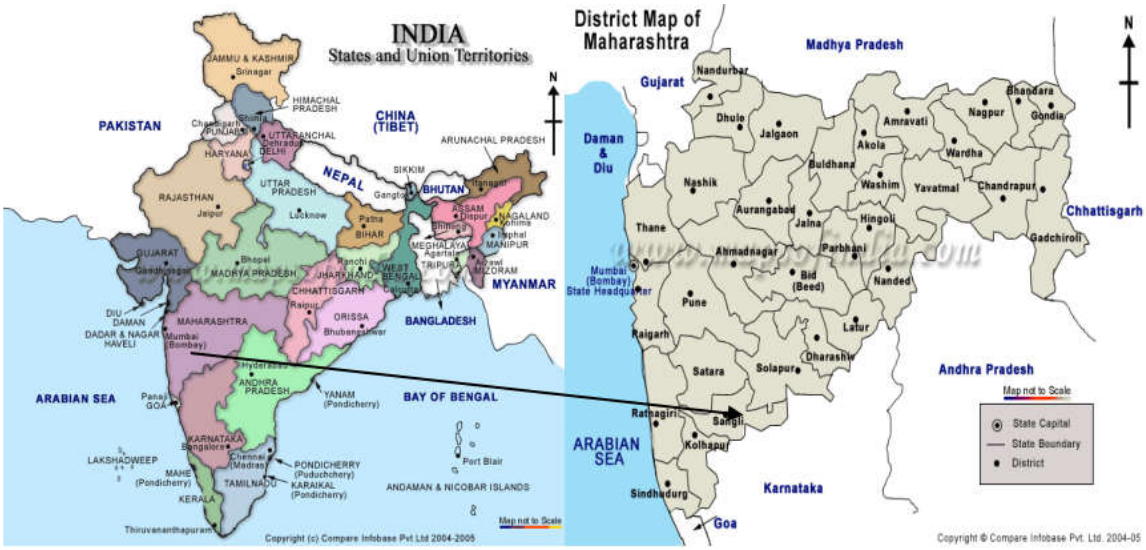
1.9 Project Location

The project activity is located at Jath site, District-Sangli, State-Maharashtra. The latitude and longitude of each WTG are as follows:

Survey Field No. / Gat No.	Latitude	Longitude	Location
59	N16° 58’ 46.3”	E 75° 14’ 31.3”	Loc. No. JTH - 292 Village-Mendhegiri,

			Taluka - Jath, District - Sangli (Maharashtra)
128/1 & 128/2	N16° 59” 40.4”	E 75° 13’ 46.5”	Loc. No. JTH - 293 Village-Mendhegiri, Taluka - Jath, District - Sangli (Maharashtra)
109	N16° 59’ 50.5”	E 75° 14’ 10.4”	Loc. No. JTH - 247 Village-Mendhegiri, Taluka - Jath, District - Sangli (Maharashtra)
32	N17° 00’ 9”	E 75° 17’ 00.9”	Loc. No. 300, Village - Muchandi, Taluka - Jath, District - Sangli (Maharashtra)
91	N16° 58’ 56.5”	E 75° 14’ 18.9”	Loc. No. 294, Village-Mendhegiri, Taluka - Jath, District - Sangli (Maharashtra)

Geographical location can be viewed in the following maps:



1.10 Conditions Prior to Project Initiation

This is a Greenfield project. The project activity replaces the carbon intensive grid electricity. The proposed project activity effectively utilises renewable wind energy to generate electricity which will be feed into the coal intensive NEWNE Grid. Thereby the project activity reduces the dependence on fossil fuel based generation units and as there are no associated emissions with this project it contributes to the reduction of greenhouse gases (GHG) emissions.

Please refer section B.4 of the registered PDD. The web link for the same is mentioned below:
https://cdm.unfccc.int/Projects/DB/SGS-UKL1435153630.26/view

1.11 Compliance with Laws, Statutes and Other Regulatory Frameworks

The project activity is not mandatory by any local or national laws. However the project complies with technical, engineering and commissioning regulations. Please refer section B.5 of the PDD of UNFCCC registered CDM project with Ref No: 10164.

1.12 Ownership and Other Programs

1.12.1 Project Ownership

For the ownership details of the project any of the following may be referred to:

1. Power Purchase Agreement between the project promoters and State Utility
2. Commissioning certificates
3. Purchase order of WTGs

1.12.2 Emissions Trading Programs and Other Binding Limits

India is Non-annex1 country and there is no compliance with an emission trading program or to meet binding limits on GHG emissions for this project activity. The project is registered under CDM and UNFCCC (Registration ID 10164[4]). The project is also approved by the DNA and a copy of the approval is also submitted to the DOE. Project Proponent has submitted undertaking that they will not claim same GHG emission reductions of the project from CDM and VCS. PP would not use net GHG emission reductions by the projects for compliance with emission trading program to meet binding limits on GHG emissions.

1.12.3 Other Forms of Environmental Credit

Project has been registration with UNFCCC under Clean Development Mechanism program. Registration reference number is 10164[5]. Project Proponent has submitted undertaking for not availing other forms of environmental credit for the same crediting period under consideration.

1.12.4 Participation under Other GHG Programs

Project has been registration with UNFCCC under Clean Development Mechanism program, Registration reference number is 10164[6]. PP also submitted undertaking for Project neither has not intends to generate any form of GHG related environmental credit for GHG emission reductions or removals claimed under the VCS program.

1.12.5 Projects Rejected by Other GHG Programs

The Project is not rejected by other GHG programs.

1.13 Additional Information Relevant to the Project

Eligibility Criteria

The project does not fall under AFOLU category, hence not applicable.

Leakage Management

[4] https://cdm.unfccc.int/Projects/DB/SGS-UKL1435153630.26/view
[5] https://cdm.unfccc.int/Projects/DB/SGS-UKL1435153630.26/view
[6] https://cdm.unfccc.int/Projects/DB/SGS-UKL1435153630.26/view

Project does not involve any leakage emissions as this is solar power project, Hence Leakage Management Plan and risk mitigation measures are not required.

Commercially Sensitive Information

There is no commercially sensitive information accounted for the determination of baseline, net GHG removals and for demonstration of additionality for the present project activity.

Sustainable Development

The National CDM Authority (NCDMA), which is the Designated National Authority (DNA) for the Government of India (GoI) in the Ministry of Environment and Forests (MoEF), has stipulated four indicators for sustainable development in the interim approval guidelines for Clean Development Mechanism (CDM) projects in India[7]. The Project Participant believes that the project activity has contributed to sustainable development in terms of the four indicators as follows:

Social well-being:

There are several activities associated with the erection and commissioning of WTGs and this has resulted in generating employment for both skilled and unskilled manpower. People have been employed in both onsite and offsite activities thus creating direct and indirect employment opportunities that contribute up to some extent in poverty alleviation of the local community. The project activity also contributes in meeting the electricity deficit in India and hence improves quality of life of the people. Thus, the project activity has contributed to social well- being.

Economic well-being:

The project activity requires temporary and permanent, skilled and semi-skilled manpower at the wind power project site. Hence, this will create additional employment opportunities. It will also provide business opportunities for local vendors, contractors and suppliers.

Environmental well-being:

The project activity reduces the emissions of local and global pollutants. It also conserves the non-renewable energy resources as the project activity does not consume any non-renewable resource for generating the electricity. There is no solid waste from the project activity that generally happens in the case of most of the other sources of power. Thus, the project activity contributes to environmental well-being without causing any negative impact on the surrounding environment.

Technical well-being:

The investment in renewable technologies like wind will boost the sector and propel R&D in this field thus helping in evolution of better and more efficient technologies.

Thus, the project activity contributes towards the sustainable development of the region.

[7] http://envfor.nic.in/division/clean-development-mechanism-interim-approval-criteria

Further Information

There are no information or incidents that will have bearing on the eligibility of the project, the net GHG emission reductions or removals, or the quantification of the project's net GHG emission reductions or removals.

2 APPLICATION OF METHODOLOGY

2.1 Title and Reference of Methodology

Methodology Title: AMS I.D.: "Grid connected renewable electricity generation" – Version 17.0

Reference: I.D./Version 17, Sectoral Scope: 01, EB 61
http://cdm.unfccc.int/methodologies/DB/RSCTZ8SKT4F7N1CFDXCSA7BDQ7FU1X

Methodological Tool: "Tool to calculate the emission factor for an electricity system" – Version, 04.0

Reference: http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v4.0.pdf

2.2 Applicability of Methodology

The project activity is of type (I) - renewable energy projects, as it generates electricity from renewable wind energy. The electricity generated from the project activity is being supplied to the electricity distribution system, NEWNE grid. Hence, the project activity falls in the project category – D: electricity generation for a system.

The capacity of the project activity is 10.5 MW which is less than the maximum qualifying capacity of 15 MW for a small-scale CDM project activity under type-I. The capacity of the project activity will remain within the limit of 15 MW during the whole crediting period. Hence, the project activity falls under the small-scale category.

The project activity comprises renewable energy generation units i.e. WTGs and supplies the electricity to the NEWNE grid for selling to the MSEDCL, an electricity distribution company.

Hence, approved baseline and monitoring methodology, AMS I.D, is applied to the project activity. The justification for applying AMS I.D is provided below:

S. No	Methodological Applicability Criteria	Applicability to the Project Activity
1	This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass: (a) Supplying electricity to a national or a regional grid; or (b) Supplying electricity to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling.	The project activity comprises renewable energy generation units, i.e. WTGs and supplies the electricity to the NEWNE grid. Hence, this applicability criterion of I.D. is satisfied.
2	Illustration of respective situations under which	The proposed project activity will supply

<table>
<tr>
<td></td>
<td>each of the methodology (i.e. AMS-I.D, AMS-I.F and AMS-I.A) applies is included in Table 2 of the methodology as given below:
Table 2
<table>
<tr><th></th><th>Project Type</th><th>AMS-I.A</th><th>AMS-I.D</th><th>AMS-I.F</th></tr>
<tr><td>1</td><td>Project supplies electricity to a national/regional grid</td><td></td><td>✓</td><td></td></tr>
<tr><td>2</td><td>Project displaces grid electricity consumption (e.g. grid import) and/or captive fossil fuel electricity generation at the user end (excess electricity may be supplied t a grid)</td><td></td><td></td><td>✓</td></tr>
<tr><td>3</td><td>Project supplies electricity to an identified consumer facility via national / regional grid (through a contractual arrangement such as wheeling</td><td></td><td>✓</td><td></td></tr>
<tr><td>4</td><td>Project supplies electricity to a mini grid system where in the baseline all generators use exclusively fuel oil and/or diesel fuel</td><td></td><td></td><td>✓</td></tr>
<tr><td>5</td><td>Project supplies electricity to household users (included in the project boundary) located in off grid areas</td><td>✓</td><td></td><td></td></tr>
</table>
</td>
<td>the generated electricity to NEWNE regional grid. Hence as per the situations mentioned in the Table 2, the project activity only complies with applicability conditions of AMS I.D methodology as per project type 1.</td>
</tr>
<tr>
<td>3</td>
<td>This methodology is applicable to project activities that (a) install a new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield plant); (b) involve a capacity addition; (c) involve a retrofit of (an) existing plant(s); or (d) involve a replacement of (an) existing plant(s).</td>
<td>The project activity involves installation of a new wind power project at a site where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield Plant). Hence, the criterion is applicable to the project activity.</td>
</tr>
<tr>
<td>4</td>
<td>Hydro power plants with reservoirs that satisfy at</td>
<td>The project activity is a renewable wind</td>
</tr>
</table>

	least one of the following conditions are eligible to apply this methodology: • The project activity is implemented in an existing reservoir with no change in the volume of reservoir; • The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the Project Emissions section, is greater than 4 W/m^2; • The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the Project Emissions section, is greater than 4 W/m^2.	energy based power project. Hence, the criterion is not applicable to the project activity.
5	If the new unit has both renewable and non-renewable components (e.g., a wind/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the new unit co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW.	The project activity has only renewable energy component i.e. wind. There is neither non-renewable component added nor co-firing is required in the project activity. The capacity of the renewable wind power project activity is 10.5 MW that is less than 15 MW. Hence, this criterion is satisfied.
6	Combined heat and power (co-generation) systems are not eligible under this category.	The project activity is a renewable wind energy based power project not a cogeneration system. Therefore, this criterion is not applicable to the project activity.
7	In the case of project activities that involve the addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units.	The project activity is a green field project hence it does not involve the addition of renewable energy generation units at an existing renewable power generation facility. The capacity of the project activity is 10.5 MW. Therefore, this criterion is not applicable to the project activity.
8	In the case of retrofit or replacement, to qualify as a small-scale project, the total output of the retrofitted or replacement unit shall not exceed the limit of 15 MW.	The project activity is a green field project hence there is no retrofit or replacement. Therefore, this criterion is not applicable to the project activity.

As per this discussion it is clear that the methodology AMS I.D., version 17, is applicable to the project activity.

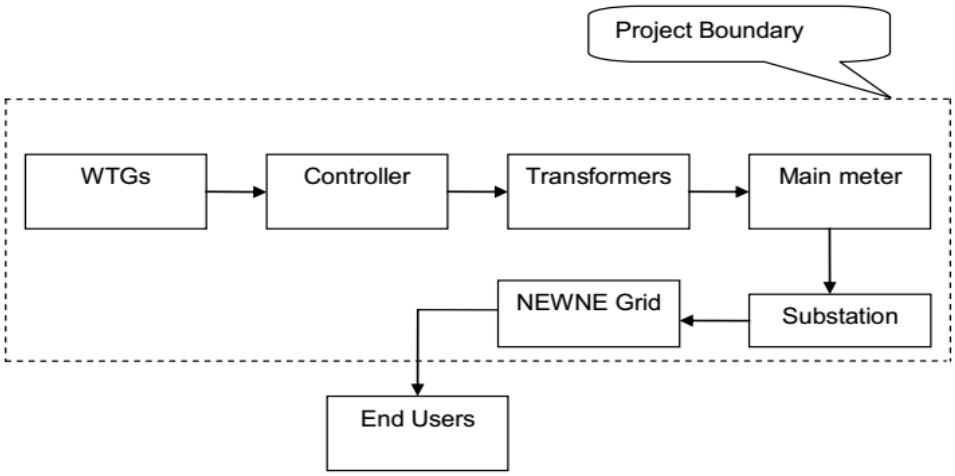
Applicability of Methodological Tool: "Tool to calculate the emission factor for an electricity system" – Version, 04.

Since project activity supplies electricity to grid, Tool to calculate the emission factor for an electricity system is used to calculate baseline emissions and resulting emission reductions.

2.3 Project Boundary

As per para 9 of the applied small scale methodology, AMS I.D., version 17, the spatial extent of the project boundary includes the project power plant and all power plants connected physically

to the electricity system that the CDM project power plant is connected to. Thus, the project boundary of the project activity includes wind energy generators, dedicated metering system of PP WTGs and the NEWNE grid as shown below:



2.4 Baseline Scenario

Please refer to section B.4 of the PDD of UNFCCC registered CDM project with Ref No: 10164. The web link for the same is given below:

https://cdm.unfccc.int/Projects/DB/SGS-UKL1435153630.26/view

2.5 Additionality

Please refer to section B.5 of the PDD of UNFCCC registered CDM project with Ref No: 10164. The web link for the same is given below:

https://cdm.unfccc.int/Projects/DB/SGS-UKL1435153630.26/view

2.6 Methodology Deviations

Not Applicable

3 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

3.1 Baseline Emissions

Not Applicable

3.2 Project Emissions

Not Applicable

3.3 Leakage

Not Applicable

3.4 Net GHG Emission Reductions and Removals

Not Applicable

4 MONITORING

4.1 Data and Parameters Available at Validation

Not Applicable

4.2 Data and Parameters Monitored

Not Applicable

4.3 Monitoring Plan

Not Applicable

5 SAFEGUARDS

5.1 No Net Harm

Not Applicable

5.2 Environmental Impact

Not Applicable

5.3 Local Stakeholder Consultation

Not Applicable

5.4 Public Comments

Not Applicable

APPENDIX X: <TITLE OF APPENDIX>

Not Applicable