energy
Department:
Energy
REPUBLIC OF SOUTH AFRICA

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Project Design Document (PDD)

Project reference number (office	
Date received (office use only)	

NOTES ON COMPLETING THIS PROJECT DESIGN DOCUMENT

1. Please provide this PDD in both hard-copy

Part A: Project Proponent Details

Project Name	South African Grid Connected Wind Farm Programme (also referred to as 'this PoA')
Date of Submission of PDD	15/02/2012

Project Developer	
Name	Blue World Carbon Asset Management (Pty) Ltd (also referred to as 'BWC')
Organizational Category	Private company
Legal Status	Limited company
Street Address	Suite 101, Block A 7 West Quay Road V&A Marina Cape Town, 8001 Republic of South Africa
Postal Address (if different from above)	

Website Address	www.blueworldcarbon.com
Main Activities	Blue World Carbon (BWC) is the leading international company that specializes in developing solutions and rendering professional services in the sphere of climate change, Clean Development Mechanism (CDM), greenhouse gas management and energy consulting.
Summary of Financial Performance in last fiscal year	Capital expenditure phase
Contact Person(s)	Joost van Lier (Managing Director, South Africa)
Telephone	Work: +27 (0)82 607 1440 Cell: +27 (0)71 609 2276
Fax	+27 (0)86 609 2770
Email Address	joost.van.lier@blueworldcarbon.com
Project Partners Provide the following Information for **all** project partners (copy and paste relevant sections of the table if information is to be provided on more than one partner organisation)	
Name	Windlab Developments South Africa (Pty) Ltd (Hereinafter referred to as 'Windlab')
Nature of partner	A wind farm developer that seeks to list their project under the present Programme of Activities (PoA). Windlab is the first CDM Programme Activity (CPA) under the present PoA.
Organizational Category	Private company
Legal Status (if private company)	Limited company
Street Address	Green Building, 9B Bell Crescent Close Westlake Business Park Cape Town
Postal Address (if different to Street Address)	
Website Address	www.windlab.com
Main Activities	Windlab is a global wind energy development company established in 2003 as a spin out from Australia's pre-eminent research organisation CSIRO (the Commonwealth Scientific and Industrial Research Organisation). Windlab exclusively owns and utilises a suite of world-leading atmospheric modelling and wind energy prospecting tools to identify and efficiently deliver ready-to-build wind farm sites.
Contact Person(s)	Katherine Degenaar
Telephone	Cell: +27 (0)73 819 4870 Office: +27 (0)21 701 1292
Fax	0800 981 222

Email Address	katherine.degenaar@windlab.com
Contractual Arrangements	
Contractual arrangements between various entities involved	BWC is a coordinating and managing entity of the PoA. BWC will act as a carbon consultant to develop all necessary CDM documentation, conduct procedures for PoA approval by the CDM Executive Board, direct CPA inclusion, monitor CPAs, and sell CERs in the international market for all CPAs under the PoA. BWC receives a fee for their services. Windlab is the first CPA under this PoA.

Part B: Project Overview (Technical Summary, Location and Schedule)

Technical Summary of the project	
Objective of the Project	The aim of the project is to supply clean electricity to the grid of the Republic of South Africa (RSA).
Project Description The main objective of the South African Grid Connected Wind Farm Programme is to contribute to the development and promotion of renewable energy in the RSA by building a framework to secure carbon revenue for wind farm developers for projects which are being implemented in the period of time when these projects cannot be registered as CDM projects due to the approaching 2013 deadline. The programme seeks to develop a series of grid connected wind power projects that supply clean electricity to either the national grid of the RSA or an identified consumer via RSA's grid. Participation in this PoA will enable the wind farm developers to overcome the political and financial barriers and uncertainties associated with renewable energy development in the RSA as well as to increase the economic viability of wind farm construction projects due to the revenue from selling CERs. The reduction of GHG emissions as a result of the implementation of the independent activities will be achieved due to reduction of CO_2 emissions from combustion of fossil fuel at the existing grid-connected power plants and plants which would likely be built in the absence of the independent activities. The first CPA under this PoA (CPA 001) is a 10 MW wind farm development that forms part of Windlab's Amakhala Emoyeni Wind Farm development.	
Project Constraints: There are no constraints	
Technology to be employed	Wind farms eligible under this PoA consist of either a wind turbine or multiple wind turbines connected with each other to produce electricity. A wind turbine captures the kinetic energy of the wind to drive a generator located within the wind turbine where this energy is subsequently converted into electricity. The amount of energy the turbine can harness is dependent on the wind velocity and the length of the rotor blades.
Greenhouse Gases Targeted	The implementation of the project will lead to reduction of greenhouse gas (GHG) emissions from combustion of fossil fuel for electricity generation at grid connected power plants. The principal GHG released during combustion of fossil fuel is CO_2. Emissions of CH_4 and N_2O from combustion of fossil fuel are negligibly small as compared with CO_2 emissions and excluded for

<table>
<tr><th colspan="2">Technical Summary of the project</th></tr>
<tr><td></td><td>simplification.</td></tr>
<tr><td>Emission reductions</td><td>The starting date of the crediting period of CPA 001 is expected to be 01/01/2014. CPA 001 is a 10 MW wind farm. The total emission reductions at the end of the first 7-year crediting period is expected to be 163 576 tCO_2.

(Note: Version 1 of the CDM documents (PoA-DD and CPA) applied a 10 year crediting period. This will be amended to a 7 year crediting period in version 2 of the PoA and CPA)

<table>
<tr><th>Year</th><th>ER, tCO_2 /yr</th></tr>
<tr><td>2014</td><td>23 368</td></tr>
<tr><td>2015</td><td>23 368</td></tr>
<tr><td>2016</td><td>23 368</td></tr>
<tr><td>2017</td><td>23 368</td></tr>
<tr><td>2018</td><td>23 368</td></tr>
<tr><td>2019</td><td>23 368</td></tr>
<tr><td>2020</td><td>23 368</td></tr>
<tr><td>Average</td><td>23 368</td></tr>
<tr><td>Total</td><td>163 576</td></tr>
</table></td></tr>
<tr><td>Baseline & Additionality Assessment</td><td>Approved consolidated baseline and monitoring methodology ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” (Version 12.2.0) is used for activities under this PoA. This methodology is applicable to grid-connected renewable power generation project activities which includes the construction of wind farms.

The additionality for activities under this PoA will be demonstrated at CPA level in accordance with the latest version (at the time of drafting the PoA-DD) of the “Tool for the demonstration and assessment of additionality” (Version 06.0.0). To demonstrate the additionality for each activity under a CPA the project developer will have to choose whether to apply an investment analysis, or investment and barrier analysis, together with the common practise analysis.

The decision to demonstrate additionality on CPA level was governed by the variability of factors that affect the possible investment or barrier analysis. Over time factors like investment cost, electricity price and exchange rates may vary to such an extent that it surpasses the scope of a generic investment analysis in a PoA. Similarly, for a barrier analysis the state of political, market, technological and investment barriers may alter significantly over the course of the PoA.</td></tr>
<tr><td>Monitoring</td><td>This project will be monitored according to the monitoring rules provided in ACM0002. The parameter to be monitored is the quantity of net electricity generation supplied by the wind farm to the grid of the RSA.</td></tr>
<tr><td>Type of project/activities</td><td>Energy Supply</td></tr>
</table>

Technical Summary of the project	
a. Energy Supply	Renewable Energy (excluding biomass) The project uses wind turbines to convert the kinetic energy of the wind into electricity. The produced electricity will be supplied to the grid of the RSA.
b. Energy Demand	Not Applicable
c. Industrial Process	Not Applicable
d. Transport	Not Applicable
e. Waste Management	Not Applicable
f. Forestry/ land use	Not Applicable
g. Other	Not Applicable
Project Boundary The project boundary encompasses the physical, geographical site of the renewable generation source.	
Indicate Emissions outside the Project Boundary	Not Applicable

NOTE: At the present time project specific information can only be given for the first CPA (CPA 001) under this PoA.

Location of the Project	
Province	Eastern Cape Province (CPA 001) (The geographical boundary of this PoA is the boundary of the RSA, and therefore includes all provinces in the RSA.)
Municipality	Blue Crane Route Local Municipality
Nearest city/large town	Bedford
Brief description of the location of the project site	CPA 001 is located on Farm 'Barkfontein' 141/3 which is approximately 10 km South-West of the town of Bedford in the Eastern Cape Province of the RSA. The GPS co-ordinates of the location are 32°45'53" S and 25°58'45" E.

Project Schedule/Timetable	
Earliest Project Start Date	01/01/2013 (Start date of construction of CPA 001)
When is the expected first year of CER delivery	2015 (The start date of crediting period is of CPA 001 is on the 01/01/2014)
Project Lifetime	28 years (lifetime of PoA)
Project End Date	31/12/2041 (28 years after start of crediting period)
Crediting Period	A 7 year crediting period with the option of renewal has been identified for CPAs under this PoA.

Project Schedule/Timetable	
Current Status or phase of the project	At the moment, the project conducted the following activities: • The Final Environmental Impact Report is completed • Record of Decision (ROD) has been obtained from the Department of Environmental Affairs. • The Feasibility Study is completed • The PoA, CPA Template and CPA 001 has was written by BWC and submitted to a DOE. • The Draft Validation Report from DOE (Carbon Check) has been received and is submitted with this application form. • Awaiting a PPA from the Department of Energy
DNA Approval	The project has not been previously submitted to the DNA for approval. A Project Identification Note (PIN) for the 'Amakhala Emoyeni Grid Connected 750 MW Wind Farm, Phase 1, South Africa' was submitted to the DNA on 9 September 2011. CPA 001 forms part of this large wind farm project.
Approval by other bodies	The project (or any elements of the project) has not been submitted to any other national, provincial or local government departments or agencies for regulatory or legal approval (excluding EIA process – see Part C).

Part C: Performance Against the DNA's Sustainable Development Criteria

South Africa has identified the following sustainable development criteria and indicators against which each CDM project will be assessed. Please provide your interpretation of how this project will address each of these **criteria and indicators** where they are relevant to the project. If the space provided is not sufficient please append additional information as required.

NOTE: For all indicators which are of relevance to the project show how the performance of the project against these indicators can be objectively monitored and measured on an ongoing basis.

1. Economic: Does the project contribute to national economic development?

Yes. Worldwide expansion of the renewable energy industry points to the sustainable development of the country's economy. The implementation of the proposed project will promote development of wind farms in the RSA which in turn will lead to the creation of new job opportunities both during the construction and operation phases. The implementation of a programme for wind farms will make a contribution to achieve the objective to reduce the RSA's GHG emissions below the current emissions baseline of around 34% by 2020 and contribute to the 1850 MW onshore wind set out in accordance with the capacity allocated to renewable energy generation in IRP 2010-2030 [http://www.ipp-renewables.co.za/].

2. Social: Does the project contribute to social development in South Africa?

Yes. The project will ensure the creation of new job opportunities.

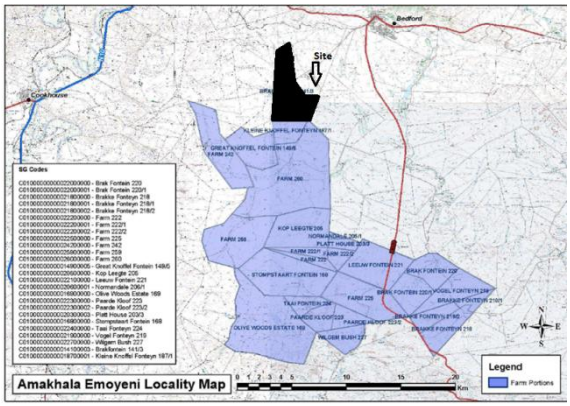
3. Environmental: Does the project conform to the National Environmental Management Act principles of sustainable development?

Yes. The PoA governs that all CPAs need to apply for environmental authorisation individually. The National Environmental Management Act 107 of 1998, amended in June 2010, states that either an Environmental Impact Assessment (EIA) or Basic Assessment (BA) is required, depending on the nature of the activity.

With Regard to the CPA 001:

The project owner appointed Savannah Environmental (Pty) Ltd to undertake the Scoping and Environmental Impact Assessment for the Amakhala Emoyeni wind farm which proposes to produce up to 750 MW. As part of these environmental studies, the public involvement process was undertaken by Sustainable Futures ZA in terms of the NEMA EIA Regulations and CDM requirements based on the Kyoto protocol. The EIA was submitted to the Department of Environmental Affairs on 25 November 2010. On 2 September 2011 the Record of Decision (ROD) was obtained and Environmental Authorisation was granted for the proposed wind farm development.

CPA 001 forms a small part of the Amakhala Emoyeni wind farm as illustrated in the figure below. CPA 001 (indicated in black) comprises only about 5% of the Amakhala Emoyeni wind farm.



All the impacts listed below, as assessed in the EIA for the Amakhala Emoyeni wind farm, will be significantly lower for CPA 001 since it forms only a small fraction (both in size and capacity) of this large wind farm development.

i) That the **disturbance of ecosystems and loss of biological diversity** are avoided, or where they cannot be avoided, are minimised and remedied	Mitigation plans for potential disturbances will be implemented as identified by environmental specialists. The construction of the wind farm and the associated disturbance of the vegetation will have a moderate to low impact on the ecology, flora, fauna and avifauna of the project site with the implementation of mitigation strategies. The Amakhala Emoyeni wind farm is spread over an area of 273 km^2.
ii) That **pollution and degradation of the environment** are avoided, or where they cannot be altogether avoided, are minimised and remedied	The project implementation will not lead to pollution and degradation of the environment. Combustion of fossil fuels (mostly coal) at the Eskom power stations and hereby emissions of the harmful substances into the atmosphere, such as flue ash, oxides of sulphur and nitrogen will be reduced due to the project implementation.
iii) That the **disturbance of landscapes and sites that constitute the nation's cultural heritage** is avoided, or where it cannot be altogether avoided, is minimised and remedied	The Amakhala Emoyeni wind farm is spread over an area of 273 km^2, of which only 1.5% will form the actual wind farm. The establishment of the wind turbines and the associated infrastructure does impact the aesthetic quality of the landscape during the construction and operational phases. Recommended mitigation plans by environmental specialists will be implemented in order to reduce the potential disturbance or destruction on heritage resources from medium to acceptable moderate-low significance.
iv) That **waste is avoided**, or where it cannot be altogether avoided, minimised and reused or recycled where possible and otherwise disposed of in a responsible manner	The project will produce minimal waste and such waste will be disposed of in a responsible manner. Such waste would be limited during operation phase to the minor waste from the site office and maintenance such as fluid changes. Fluids will be disposed of and/or recycled according to applicable standards and responsible practices.
v) That **the use and exploitation of non-renewable resources is responsible and equitable**, and takes into account the consequences of the depletion of the resource	There are negligible non-renewable resources to be used in this project.
vi) That the **development, use and exploitation of renewable resources is**	The proposed project does not effect on the depletion of renewable resources. Wind energy is an inexhaustible source of the renewable

responsible and equitable, and takes into account the consequences of the depletion of the resource.	energy.
vii) That **a risk averse and cautious approach** is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions	Commercial wind farms are operational for over 25 years. Operational risks are well known and will be mitigated.
vii) That **negative impacts on the environment and on people's environmental rights** be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied	Mitigation plans for potential disturbances will be implemented as identified by environmental specialists. Combustion of fossil fuels (mostly coal) at the Eskom power stations and hereby emissions of the harmful substances into the atmosphere, such as flue ash, oxides of sulphur and nitrogen will be reduced due to the project implementation.
Other comments The RSA is anticipating another shortage of electricity supply due to the higher than anticipated economic growth combined with a number of technical factors such as overloaded electricity lines. The country is blessed with an abundance of fossil fuels, but the use of these resources in power production is becoming increasingly difficult as international pressure mounts against countries that do not comply with strict sustainable environmental policies. Wind farms do not only meet environmental requirements, but also provide a much needed additional source of electricity. In addition, the implementation of wind farms makes a contribution to achievement of the goal to generate 10 000 GWh of electricity from renewable energy by 2013.	

Indicators in Support of the Project Approval Criteria			
Category		**Indicator**	**Comment**
Environmental	Impact on local environmental quality	• Impact of the project on air quality • Impact of the project on water pollution • Impact of the project on the generation or disposal of solid waste • Any other positive or negative environmental impacts of the project (such as impacts on noise, safety, visual impacts, or traffic)	The project implementation will positively impact on air quality due to reduction of combustion of fossil fuels (mostly coal) at the grid-connected power plants. The project will not have an impact on water pollution and solid waste. The construction phase may have an impact on sensitive receptors (i.e. nearby residents). The placement of the facility and its associated infrastructure will have a visual impact on the natural scenic resources and rural character of this region. The visual index map clearly indicates the core area of potentially high visual impact within a 5 km radius of the proposed facility. The construction of the power lines and substations will generally have a medium to low impacts on the ecology of the study area. The substations and associated power lines are not expected to create a major negative visual disturbance as this smaller scale infrastructure will be dominated by the much taller wind turbines and thus blend in with the facility. Impacts for CPA 001 will be significantly lower than for the whole Amakhala Emoyeni wind farm facility.
	Change in usage of natural resources	• Impact of the project on community access to natural resources • Impact of the project on the sustainability of use of water, minerals or other non renewable natural resources • Impact of the project on the efficiency of resource utilisation	A potential impact on the natural resources is loss of grazing land due to the construction of the turbines and associated infrastructure. This can be shown to be insignificant. Permanently affected areas comprise the proposed turbine footprints (350 foundation areas of 20 m x 20 m in extent), access roads (to be rehabilitated to 4 m in width), three substations footprint (up to 200 m x 250 m in extent) and a maintenance facility (~400m^2). This amounts to only 1.5% of the total ~273m^2area which will form part of the Amakhala Emoyeni wind farm facility. Current grazing practices will still be possible between the structures. Impacts for CPA 001 will be significantly lower than for the whole Amakhala Emoyeni wind farm facility.

Indicators in Support of the Project Approval Criteria			
Category		**Indicator**	**Comment**
	Impacts on biodiversity and ecosystems	• Changes in local or regional biodiversity arising from the project	Avifauna may be impacted through collision with the blades of the wind turbines during the operational phase. Due to the size of the project, through mitigation, impact of the avifauna can be reduced to a moderate significance. The development area also does not impinge significantly on any bird fly-ways or unique landscape features. The full study of the impact on the ecology of the surrounding environment is discussed in the Environmental Impact Assessment Report. Impacts for CPA 001 will be significantly lower than for the whole Amakhala Emoyeni wind farm facility.

Indicators in Support of the Project Approval Criteria			
Category		**Indicator**	**Comment**
Economic	Economic impacts	• Impact of the project on foreign exchange requirements • Impact of the project on existing economic activity in the area • Impact of the project on the cost of energy • Impact of the project on foreign direct investment	The project will have an impact on foreign exchange requirements as the main technological equipment of the wind farm such as turbines can only be sourced from foreign suppliers. There will be some increase in skilled labour requirements to operate the solar park. There is a possibility that new manufacturing capacities will be generated in the RSA to accommodate the growing demand of wind turbines. The project implementation will not affect the electricity price since the wind farms are not able to compete with coal-fired power plants because of the higher cost price of electricity generation. The sale of carbon credits generated by the project will result in increased foreign direct investment.

Indicators in Support of the Project Approval Criteria			
Category		**Indicator**	**Comment**
	Appropriate technology transfer	• Positive or negative implications for the transfer of technology to South Africa arising from the project • Impacts of the project on local skills development • Demonstration and replication potential of the project	There will be some increase in skilled labour requirements to operate the new technology. Some of the equipment used and the skills to implement such equipment will be imported from oversees. This will help to grow the skill base in the RSA. The skill transfer will especially concentrate on local employees in the engineering and maintenance sectors. The project will demonstrate potential of power production from wind energy in the RSA. Since the RSA is at an early development phase and has ambitious targets for renewable energy in place for 2030 there is a high potential for replication of the technology.

Indicators in Support of the Project Approval Criteria			
Category		**Indicator**	**Comment**
Social	Alignment with national provincial and local development priorities	• How the project is aligned with provincial and national government objectives • How the project is aligned with local developmental objectives • Impact of the project on the provision of, or access to, basic services to the area • Impact of the project on the relocation of communities if applicable • Contribution of the project to a any specific sectoral objectives (for example, renewable energy targets)	Expansion of the renewable energy industry in the province points to the sustainable development of the region and the whole country. The project implementation promotes development of the county energy system and creates new job opportunities in the region. The project partakes in the national bidding scheme for RSA's Renewable Energy Feed-In Tariffs. At the same time the project does not negatively affect any local industries as implemented on unused deteriorated agricultural land. The implementation of wind farms will make a contribution to achieve the objective of reducing the RSA's GHG emissions below the current emissions baseline of around 34% by 2020. This project will also contribute to the 1850 MW target for new wind farms set out in accordance with the capacity allocated to renewable energy generation in IRP 2010-2030 [http://www.ipp-renewables.co.za/].

Indicators in Support of the Project Approval Criteria			
Category		**Indicator**	**Comment**
	Social equity and poverty alleviation	• Impact of the project on employment levels? (specify the number of jobs created/lost; the duration of time employed, distribution of employment opportunities, types of employment, categories of employment changes in terms of skill levels and gender and racial equity) • Impact of the project on community social structures • Impact of the project on social heritage • Impact of the project on the provision of social amenities to the community in which the project is situated • Contribution of the project to the development of previously underdeveloped areas or specially designated development nodes	The construction of this project will create jobs in the rural areas close to the wind farm. The civil engineering (construction of roads etc.) required to construct the wind farm will produce job opportunities and transfer of skills to an otherwise underprivileged rural areas. After construction of the wind farm a service team based in the regional surrounding will be responsible for maintenance and security of the wind farm. No fatal flaws were identified and the project was granted Environmental Authorisation by means of a Record of Decision. It is estimated that for the development of the Amakhala Emoyeni wind farm (up to 750 MW), approximately 220-220 full-time employees would be required for construction. The breakdown of skilled, semi-skilled and low-skilled employees would be 25%, 35% and 40% respectively. The operations period would employ up to approximately 90 full-time employees (for a 25-year period). Although not all employees would be from the Bedford area the project would implement a 'locals first' employment policy. CPA 001 forms an integrated part of the construction of this large facility and therefore it is difficult to highlight the amount of jobs allocated to this specific section of the project.

Indicators in Support of the Project Approval Criteria			
Category		**Indicator**	**Comment**
General	General Project Acceptability	• Are the distribution of project benefits deemed to be reasonable and fair?	The distribution of the project benefits is deemed to be reasonable. It contributes to technological development of the country, creates jobs in the RSA and contributes to combat climate change by reducing GHGs. The revenue from carbon credits is vital because renewable technologies require higher capital investment compared to fossil fuel powered plants.

Part D: Finance

<table>
<tr><td colspan="2">Project Costs</td></tr>
<tr><td>Development Costs (R's)</td><td></td></tr>
<tr><td>Installed Costs (R's)</td><td></td></tr>
<tr><td>Other Costs (R's)</td><td></td></tr>
<tr><td>Total Project Costs (R's)</td><td>R 154.8 million (from CPA 001)</td></tr>
<tr><td colspan="2">Sources of Finance</td></tr>
<tr><td>Equity</td><td>Not applicable</td></tr>
<tr><td>Debt (long term)</td><td>R 154.8 million (from CPA 001)</td></tr>
<tr><td>Debt (short term)</td><td>Not applicable</td></tr>
<tr><td>Amount not identified (R's)</td><td>Not applicable</td></tr>
<tr><td>Total CDM Contribution sought</td><td>Due to the fast approaching end of the Kyoto commitment period the CDM revenue has become risky to investors. Accordingly the price per CER has fallen dramatically over the last year.

Expected CER's for this project over the first 7 year commitment period:

<table>
<tr><td>Year</td><td>Million Rand from sale of CDM revenue (assuming R100/CER)</td></tr>
<tr><td>2014</td><td>2.34</td></tr>
<tr><td>2015</td><td>2.34</td></tr>
<tr><td>2016</td><td>2.34</td></tr>
<tr><td>2017</td><td>2.34</td></tr>
<tr><td>2018</td><td>2.34</td></tr>
<tr><td>2019</td><td>2.34</td></tr>
<tr><td>2020</td><td>2.34</td></tr>
<tr><td>Average</td><td>2.34</td></tr>
<tr><td>Total</td><td>16.36</td></tr>
</table>
</td></tr>
<tr><td>Expected Price of CER in case of a contract to purchase for:

A period of 7 years</td><td>R 100

(The assumed CER value at the start of the project activity. It may be significantly less.)

A 7 year crediting period with the option of renewal was chosen for the project. The project may be renewed twice, and the total crediting period may not be more than 21 years.</td></tr>
</table>

Indicate the **projected Internal Rate of Return** for the project with and without CER revenues.	Not available at present
Constraints on tradability of carbon credits	There are no constraints. It is anticipated that there may be constraints with the tradability of carbon credits post 2012.
Preliminary discussions with potential purchasers	Preliminary discussions have not taken place. The discussions will commence upon registration of the project by the EB.