PROTECTION OF THE BOLIVIAN AMAZON FOREST

Redd Services Pte Ltd

Project Title	Protection of the Bolivian Amazon Forest
Version	0.10
Report ID	V011090.00.MR
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Project ID	V011090.00
Monitoring Period	20 October 2011 to 19 October 2012
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1 PROJECT DETAILS

1.1 Summary Description of Project

This project will protect the Bolivian Amazon forest from planned deforestation, initially protecting 235 has of tropical rain forest. The methodology implemented is:

- VM0007 REDD Methodology Framework but limited to the planned deforestation activities (module VMD0006 (BL-PL) as well as other modules listed in section 2.1 below)

Protection of the project areas under this methodology will prevent the emissions from deforestation and conversion to pastures and allow the forest to reclaim its status as a primary forest.

The project is a grouped project and the instances must be located in the only geographic area defined by the union of the Departments of Pando or Beni in Bolivia. The instances must be under threat of planned deforestation for conversion to agricultural activities as defined under VM0007 at the time the project proponent took ownership of the project area.

The project starts with only one instance but this number is expected to grow with time. The instance is located in the department of Beni, 150 km south of Riberalta and forms part of the Bolivian Amazon Forest. The project area is home to species listed in the red book as vulnerable and endangered such as Cedrela Odorata: Bertholletia excelsa, Amburana cearencis. The project are has suffered in the past to some degree or other from selective logging, deforestation for agricultural purposes and deforestation resulting from human induced fires.

In protecting the forest, the project will pay special attention to endangered and vulnerable tree species native to the region while ensuring that the communities surrounding the project areas do not suffer the full impact of job losses associated with forest preservation. In addition to protecting the forests in the project areas, the project will enrich the project areas with endangered and vulnerable tree species. The prevention of deforestation will lead to the loss of employment opportunities. This will be partly mitigated by the project's area enrichment with endangered and vulnerable tree species that will generate employment throughout the duration of the project.

1.2 Sectoral Scope and Project Type

Methodology	**Characteristic**	**Value**
VM0007	Sectoral Scope	14
	Project Category	REDD Methodology Framework
	Project Activity	Planned Deforestation for conversion to agricultural use

	Grouped	yes

1.3 Project Proponent

Name	Redd Services Pte Ltd
Responsibility	Responsibility for managing the whole project
Telephone	+591 74752400
Address	10 Anson Rd, #18-17 Singapore 079903

1.4 Other Entities Involved in the Project

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1.5 Project Start Date

Project start date 20 October 2011

1.6 Project Crediting Period

Start Date	20 October 2011
End date	19 October 2041
Total number of years	30

1.7 Project Location

Instance	Characteristic	Value
1	Name	ML1ASP

	Project area (Coordinates WGS-84 UTM 20South)	**Point**	**East**	**North**
		P1	143,923	8,655,283
		P2	144,174	8,654,140
		P3	143,675	8,654,181
		P4	143,347	8,654,498
		P5	143,252	8,654,498
		P6	143,077	8,654,621
		P7	143,065	8,654,832
		P8	142,934	8,654,855
		P9	142,557	8,654,887
		P10	142,390	8,654,935
		P11	142,359	8,655,094
		P12	141,982	8,655,217
		P13	141,922	8,655,121
		P14	142,168	8,654,859
		P15	142,204	8,654,693
		P16	142,114	8,654,309
		P17	141,201	8,654,384
		P18	141,150	8,654,895
		P19	141,421	8,654,959
		P20	141,348	8,655,105
		P21	141,507	8,655,191
		P22	141,570	8,655,187
		P23	141,513	8,655,108
		P24	141,685	8,654,830
		P25	141,768	8,654,830
		P26	141,771	8,655,121
		P27	141,599	8,655,217
		P28	141,414	8,655,270
		P29	141,417	8,655,333
		P30	141,112	8,655,347
		P31	141,095	8,655,562
	Project area Total Area	235 has		

1.8 Title and Reference of Methodology

Title	Reference	Version Number
REDD Methodology Framework (REDD-MF)	VM0007	1.3
Planned Deforestation baseline (BL-PL)	VMD0006 (BL-PL)	1.1
Estimation of carbon stocks in the above- and belowground biomass in live tree and non-tree pools	VMD0001 (CP-AB)	1.0
Estimation of carbon stocks in the long-term wood	VMD0005 (CP-W)	1.1

products pool		
Estimation of emissions from activity shifting for avoided planned deforestation	VMD0009 (LK-ASP)	1.1
Estimation of emissions from market effects	VMD0011 (LK-ME)	1.0
Estimation of greenhouse gas emissions from biomass burning	VMD00013 (E-BB)	1.0
Methods for monitoring of greenhouse gas emissions and removals	VMD00015 (M-MON)	2.1
Methods for stratification of the project area	VMD00016 (X-STR)	1.0
Estimation of uncertainty for REDD project activities	VMD00017 (X-UNC)	2.0
Tool for the Demonstration and Assessment of Additionality in VCS Agriculture, Forestry and Other Land Use (AFOLU) Project Activities	VT0001	3.0
AFOLU Non-Permanence Risk Tool		3.2

2 IMPLEMENTATION STATUS

2.1 Implementation Status of the Project Activity

The project activities are being carried out in accordance with the project description. The project proponent has complete control of the project areas and all their instances. More importantly, all activities that make up the baseline scenario did not materialize:

1. no deforestation took place in any of the project instances as evidenced by the satellite imagery analysis following the methodology's monitoring principles;

2. no degradation of any kind has occurred in any of the project instance as evidenced by the satellite imagery analysis following the methodology's monitoring principles;

3. no leakage of any kind has occurred in any of the project instance as evidenced by the satellite imagery analysis and the PRA survey following the methodology's monitoring principles;

4. the complete scheduled deforestation expected under the baseline scenario has expired of all instances.

It can therefore be stated that the project activity has succeeded in suppressing the emissions of GHG from man made activities like illegal logging and deforestation.

The absence of fire or other forms of degradation like illegal logging in the project area since the start of the project has also been a very important contribution to the project. This has been in

part controlled by management policy that employees in the project instances regularly patrol the project area (specially along its borders) to monitor uncontrolled fires or illegal logging.

The same management policy has been successful in making it clear to all neighbors that management is serious about preventing illegal logging activities as well as firewood collection and other forms of degradation. This step will continue throughout the project despite the outcome of the most recent PRA that showed that respondents living in the area have access to their own forest resources and have no need to degrade the project area. Furthermore, given that the population density around the project area is extremely low and human settlements are at least 5km away, degradation if any should have been deminimis.

In addition the management has implemented the policy of allowing neighbors and employees to access non-wood resources such as nuts and fruits to ensure that they are also able to monitor possible (although unlikely) presence of outsiders seeking carbon resources. This policy along with providing employment enriching with endangered and vulnerable species the project area to the neighbors is an important contribution to both natural and human conservation of the project area.

The project proponent has verified that the agents of deforestation have no other properties that can be used for such purposes.

For deforestation, market leakage is minimal and a factor of 0.2 has been applied because the extractable volume to total biomass measured by census at the instance has been shown to be well below the value of 5% for PLM_{FT} derived from peer-reviewed literature. In addition, the merchantable biomass in the instance is nil because the trees which remain are deemed by ABT to be needed for reforestation and cannot be logged.

2.2 Project Description Deviations

None.

2.3 Grouped Project

No new instances were added.

3 DATA AND PARAMETERS

3.1 Data and Parameters Available at Validation

Data / parameter:	*CF*
Data unit:	t C t d.m.-1
Description:	Carbon fraction of dry matter in t C t-1 d.m.

Source of data:	Methodology's default value
Value applied:	0.47 t C t-1 d.m.
Justification:	Allowed under methodology
Any comment:	N/A

Data / parameter:	*fj(X,Y)*
Data unit:	t d.m. tree-1
Description:	Allometric equation for species *j* linking measured tree variable(s) to aboveground biomass of living trees, expressed as t d.m. tree-1
Source of data:	Brown (1997 Updated)
Value applied:	Biomass = exp(-2.289+2.649) x lndbh-0.021 x lndbh2)
Justification:	Allowed under methodology for tropical moist forest
Any comment:	N/A

Data / parameter:	*R*
Data unit:	t root d.m. t -1 shoot d.m.
Description:	Root to shoot ratio appropriate to species or forest type / biome; note that as defined here, root to shoot ratio is applied as belowground biomass per unit area:aboveground biomass per unit area (not on a per stem basis)
Source of data:	Methodology
Value applied:	.24
Justification:	Allowed under methodology for tropical moist forest
Any comment:	

Data / parameter:	*BCEF*
Data unit:	Dimensionless
Description:	Biomass conversion and expansion factor for conversion of commercial wood volume per unit area to total aboveground tree biomass per unit area;
Source of data:	IPCC 2006 INV GLs AFOLU Chapter 4 Table 4.5
Value applied:	
Justification:	Humid tropical natural forest
Any comment:	

Volume	BCEF
<10	10.0
11-20	4.44
21-40	3.11
41-60	2.28
61-80	1.89
80-120	1.67
120-200	1.44
>200	1.05

Data / parameter:	*Ofty*
Data unit:	Dimensionless

Description:	OF = Fraction of wood products that will be emitted to the atmosphere between 5 and 100 years after production by class of wood product *ty*;
Source of data:	The source of data is the published paper of Winjum *et al*. 19983
Value applied:	0.84
Justification:	Allowed under methodology for sawn wood from tropical moist forests
Any comment:	N/A

Data / parameter:	*SLFty*
Data unit:	Dimensionless
Description:	SLF = Fraction of wood products that will be emitted to the atmosphere
Source of data:	The source of data is the published paper of Winjum *et al*. 19984
Value applied:	0.20
Justification:	Allowed under methodology for sawn wood from tropical moist forests
Any comment:	

Data / parameter:	*Wwty*
Data unit:	dimensionless
Description:	WW = Fraction of extracted biomass effectively emitted to the atmosphere during production by class of wood product *ty*
Source of data:	The source of data is the published paper of Winjum *et al*. 19985
Value applied:	0.24
Justification:	Allowed under methodology for sawn wood from tropical moist forests
Any comment:	

Data / parameter:	*Pcomi*
Data unit:	Dimensionless
Description:	Commercial volume as a percent of total aboveground volume in stratum i.
Source of data:	Forest inventory from a proxy area in the same region, representing the same forest type and age class, distinguishing commercially viable stocks on the basis of species and tree size, referencing local expert knowledge of harvest practices and markets National and forest type-specific or eco-region-specific

Forest Type	Source	*Pcomi*
Secondary forest<20 years	Census Monte Libano	*0*

Value applied:	

Instance-stratum	*Pcomi*
ML1ASP-1	0

Justification:	Allowed under methodology
Any comment:	

Data / parameter:	*Aplanned,I*
Data unit:	Ha
Description:	Total area of planned deforestation over the fixed baseline period for stratum *I*

Source of data:	Official Deforestation Plan and satellite imagery
Value applied:	<table><tr><td>Instance-stratum</td><td>Surface (has)</td><td>Source</td></tr><tr><td>ML1ASP-1</td><td>235</td><td>Official Deforestation Plan</td></tr><tr><td></td><td></td><td></td></tr></table>
Justification:	Allowed under methodology
Any comment:	

Data / parameter:	*L-D,I*
Data unit:	%
Description:	Likelihood of deforestation in stratum i
Source of data:	Analysis of Remote Sensing data and/or legal records for a number of proxy areas
Value applied:	100%
Justification:	Allowed under methodology for private properties
Any comment:	

Data / parameter:	*HistHai*
Data unit:	Ha
Description:	Average annual area of deforestation by the baseline agent of deforestation in stratum *i* for the 5 years prior to project implementation
Source of data:	Analysis of Remote Sensing data and/or legal records and/or survey information for lands owned or controlled or previously owned or controlled by the baseline agent of deforestation
Value applied:	<table><tr><td>Instance</td><td>Surface</td><td>Source</td></tr><tr><td>ML1ASP</td><td>0 has</td><td>No application to deforest made since 1996 and before 2011</td></tr></table>
Justification:	
Any comment:	Must be re-evaluated whenever the baseline is revised

Data / parameter:	*Dmn*
Data unit:	t d.m.m-3
Description:	Mean wood density of commercially harvested species
Source of data:	Regional average (0.58 t d.m.m-3- tropical Africa; 0.60 t d.m.m-3- tropical America; 0.57 d.m.m-3- tropical Asia) from Brown, S. 1997. Estimating Biomass and Biomass Change of Tropical Forests: a Primer. For the Food and Agriculture Organization of the United Nations. Rome, 1997. FAO Forestry Paper - 134. ISBN 92-5-103955-0.
Value applied:	0.60
Justification:	From methodology
Any comment:	

Data / parameter:	*LDF*
Data unit:	t C m-3
Description:	Factor for calculating the biomass of dead wood created during logging operations per cubic meter extracted
Source of data:	Default value for broadleaf and mixed forests of 0.53 t C m-3 from 774 logging gaps measured by Winrock International in Bolivia, Belize, the Republic of Congo, Brazil and Indonesia may be used for tropical broadleaf forests (cf. Annex 1). Default value for coniferous forests of 0.25 t C m-3 from 134 logging gaps measured by Winrock International in Mexico (cf. Annex 1).
Value applied:	0.53
Justification:	From methodology
Any comment:	

Data / parameter:	*LIF*
Data unit:	t C m-3
Description:	Factor for calculating the emissions arising from the creation of logging infrastructure (roads, skid trails and decks) during logging operations per cubic meter extracted
Source of data:	Conservative default value of 0.29 t CO2-e m-3 calculated from 1,839 hectares of logging concessions analysed by Winrock International in the Republic of Congo and Brazil, may be used for tropical broadleaf forests (cf. Annex 1).
Value applied:	*0.29*
Justification:	From methodology
Any comment:	

Data / parameter:	*PMLFT*
Data unit:	%
Description:	Mean merchantable biomass as a proportion of total aboveground tree biomass for each forest type
Source of data:	Peer reviewed literature: Table 2 of Measuring leakage from carbon projects in open economies: a stop timber harvesting project in Bolivia as a case study Brent Sohngen and Sandra Brown (2004): average volume of affected area. Section 5.2 of http://www.fao.org/docrep/W4095E/W4095E00.htm Brown (1997). Biomass density of closed forest in Bolivia. Appendix 1 of http://www.fao.org/docrep/W4095E/W4095E00.htm: Mean wood density of .594 for American tropical forests
Value applied:	average volume of affected area=21.47 M3 Biomass density of closed forest in Bolivia=230 t/ha Mean wood density=.594 t/m3 PMLFT=5.2%
Justification:	
Any comment:	

Data / parameter:	*VBSL,EX,i,t*
Data unit:	M3
Description:	Volume of timber projected to be extracted from within the project boundary during the baseline in stratum *i* at time *t*
Source of data:	field measurements
Value applied:	<table><tr><td>Instance-stratum</td><td>Volume (m3)</td></tr><tr><td>ML1ASP-1</td><td>0</td></tr><tr><td></td><td></td></tr></table>
Justification:	
Any comment:	Volume does not include logging slash left onsite

Data / parameter:	*Ggi*
Data unit:	g kg-1 dry matter burnt
Description:	Emission factor for stratum *i* for gas *g*,
Source of data:	Defaults can be found in Volume 4, Chapter 2, of the IPCC 2006 Inventory Guidelines in table 2.5 (see Annex 2: emission factors for various types of burning for CH4 and N2O).
Value applied:	<table><tr><td>Gas type</td><td>*Ggi*</td></tr><tr><td>CH4</td><td>6.8</td></tr><tr><td>N2O</td><td>.2</td></tr></table>
Justification:	
Any comment:	Only use for tropical forests

Data / parameter:	*COMFi*
Data unit:	dimensionless
Description:	combustion factor for stratum *i* (vegetation type)
Source of data:	default values in Table 2.6 of IPCC, 2006 (Annex 2)
Value applied:	<table><tr><td>Forest Type</td><td>*COMFi*</td></tr><tr><td>Primary</td><td>.36</td></tr><tr><td>Secondary</td><td>.55</td></tr></table>
Justification:	
Any comment:	

3.2 Data and Parameters Monitored

Data / parameter:	Asp
Data unit:	ha
Description:	Area of sample plots in ha
Source of data:	Recording and archiving of number and size of sample plots
Description of measurement methods	Constructed from GPS, compass data and measuring tape.

and procedures to be applied:	Square plot with side 30m. Sides are aligned with the North South East and West directions.
Frequency of monitoring/recording:	Monitoring must occur at least every ten years for baseline renewal. Where carbon stock enhancement is included monitoring shall occur at least every five years
Value applied:	.1225
Monitoring equipment:	GPS and compass data
QA/QC procedures to be applied:	Standard quality control / quality assurance (QA/QC) procedures for forest inventory, including field data collection and data management, shall be applied
Calculation method:	
Any comment:	

Data / parameter:	N
Data unit:	Dimensionless
Description:	Number of sample points
Source of data:	Recording and archiving of number of sample points
Description of measurement methods and procedures to be applied:	Determined so as to minimize the uncertainty of GHG.
Frequency of monitoring/recording:	Monitoring must occur at least every ten years for baseline renewal. Where carbon stock enhancement is included monitoring shall occur at least every five years
Value applied:	<table><tr><td>Instance-stratum</td><td>*N*</td></tr><tr><td>ML1ASP-1</td><td>21</td></tr><tr><td></td><td></td></tr></table>
Monitoring equipment:	
QA/QC procedures to be applied:	Standard quality control / quality assurance (QA/QC) procedures for forest inventory, including field data collection and data management, shall be applied
Calculation method:	
Any comment:	Where carbon stock estimation occurs only for determination of the baseline this parameter shall be known ex-ante. Where part of project monitoring, ex-ante the number of sample plots shall be estimated based on projected sample effort relative to projections of growth and emissions.

Data / parameter:	DBH
Data unit:	cm
Description:	Diameter at breast height of a tree in cm
Source of data:	Field measurements in sample plots
Description of measurement methods and procedures to be applied:	Measured at 1.3m aboveground. Measure all trees above 6.35cm DBH.
Frequency of monitoring/recording:	Monitoring must occur at least every ten years for baseline renewal. Where carbon stock enhancement is included monitoring shall occur at least every five years
Value applied:	Records available to verification entity

Monitoring equipment:	Measuring tape
QA/QC procedures to be applied:	Standard quality control / quality assurance (QA/QC) procedures for forest inventory, including field data collection and data management, shall be applied
Calculation method:	
Any comment:	Where carbon stock estimation occurs only for determination of the baseline this parameter shall be known ex-ante. Where part of project monitoring, ex-ante DBH shall be estimated based on projections of growth.

Data / parameter:	Asf
Data unit:	m^2
Description:	Area of one sampling frame
Source of data:	Recording and archiving size of sampling frame plot
Description of measurement methods and procedures to be applied:	Constructed from GPS, compass data and measuring tape. Square plot with side 1m. Sides are aligned with the North South East and West directions. Shares SW corner with Asp unless trees present in the frame. Then the SW corner is displaced 1 m in the east direction until trees are absent.
Frequency of monitoring/recording:	Monitoring must occur at least every ten years for baseline renewal.
Value applied:	1
Monitoring equipment:	Measuring tape
QA/QC procedures to be applied:	Standard quality control / quality assurance (QA/QC) procedures for forest inventory, including field data collection and data management, shall be applied
Calculation method:	
Any comment:	Shall be known ex-ante.

Data / parameter:	Ai
Data unit:	ha
Description:	Total area of stratum i
Source of data:	Official Deforestation Plan and satellite imagery
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	At a minimum every time the baseline is updated (at least every 10 years)
Value applied:	Instance-stratum: Surface (has) ML1ASP-1: 235 :
Monitoring equipment:	Satellite imagery
QA/QC procedures to be applied:	
Calculation method:	Computed using satellite imagery. The areas are stratified with polygons and their area determined.
Any comment:	Ex-ante it shall be assumed that strata area will remain constant

Data / parameter:	Vex,I
Data unit:	m3

Description:	The volume of timber in m3 extracted from within the stratum (does not include slash left onsite), reported by wood product class and preferably species.
Source of data:	field measurements
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	At a minimum every time the baseline is updated (at least every 10 years)
Value applied:	<table><tr><td>Instance-stratum</td><td>Volume (m3)</td></tr><tr><td>ML1ASP-1</td><td>0</td></tr><tr><td></td><td></td></tr></table>
Monitoring equipment:	
QA/QC procedures to be applied:	Standard quality control / quality assurance (QA/QC) procedures for forest inventory, including field data collection and data management, shall be applied
Calculation method:	
Any comment:	Baseline removals will be known ex-ante. With project removals are classed as project emissions and where expected shall be detailed ex-ante alongside evidence on expected harvested volumes.

Data / parameter:	EBSL SS
Data unit:	t CO2-e
Description:	Carbon stock or GHG sources in the baseline case
Source of data:	The terms denoting significant carbon stocks, GHG sources or leakage emissions from baseline modules BL-PL to calculate net emission reductions.
Measurement	
Frequency of monitoring/recording:	Monitored at least once every ten years (or when the baseline is revisited)
Value applied:	<table><tr><td>Instance-stratum</td><td>t CO2-e</td></tr><tr><td>ML1ASP-1</td><td>71,102</td></tr><tr><td></td><td></td></tr></table>
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	The standard error of the biomass in sample plots
Any comment:	Baseline stocks and sources are estimated ex-ante for each baseline period

Data / parameter:	EP,SS
Data unit:	t CO2-e
Description:	Carbon stock or GHG in the with-project case
Source of data:	The terms denoting significant carbon stocks, GHG sources or leakage emissions used in calculating net emission reductions

	from the following relevant modules: CP-AB, CP-W.
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	Monitored at least once every five years
Value applied:	Instance-stratum: t CO2-e ML1ASP-1: 0
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	The standard error of the biomass in sample plots
Any comment:	The ex-ante estimation shall be derived directly from the estimations originating in the relevant modules: CP-AB, CP-W.

Data / parameter:	UBSL,SS
Data unit:	%
Description:	Percentage uncertainty (expressed as 95% confidence interval as a percentage of the mean where appropriate) for carbon stocks and greenhouse gas sources in the baseline case (1,2…n represent different carbon pools and/or GHG sources)
Source of data:	Calculations arising from field measurement data
Description of measurement methods and procedures to be applied:	Uncertainty in pools derived from field measurement with 95% confidence interval calculated as the standard error of the averaged plot measurements in each stratum multiplied by the t value for the 95% confidence level. For wood products the uncertainty should be the confidence interval around the volume of timber extracted from the forest. For emission sources conservative parameters should be used sufficient to allow the uncertainty to be set as zero.
Frequency of monitoring/recording:	Monitored at least once every ten years (or when the baseline is revisited)
Value applied:	Instance-stratum: % ML1ASP-1: 23.0
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	The standard error of the biomass in sample plots
Any comment:	Baseline stocks and sources are estimated ex-ante for each baseline period

Data / parameter:	UP,SS
Data unit:	%
Description:	Percentage uncertainty (expressed as 95% confidence interval as a percentage of the mean where appropriate) for carbon stocks and greenhouse gas sources in the with-project case (1,2…n represent different carbon pools and/or GHG

	sources)
Source of data:	Calculations arising from field measurement data
Description of measurement methods and procedures to be applied:	Uncertainty in pools derived from field measurement with 95% confidence interval calculated as the standard error of the averaged plot measurements in each stratum multiplied by the t value for the 95% confidence level. For wood products the uncertainty should be the confidence interval around the volume of timber extracted from the forest. For emission sources conservative parameters should be used sufficient to allow the uncertainty to be set as zero.
Frequency of monitoring/recording:	Monitored at least once every five years
Value applied:	Instance-stratum: % ML1ASP-1: 0
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	The standard error of the biomass in sample plots
Any comment:	Ex-ante the uncertainty in the with-project carbon stocks and sources shall be equal to the calculated baseline uncertainty

Data / parameter:	PMPi
Data unit:	%
Description:	Merchantable biomass as a proportion of total aboveground tree biomass for stratum i within the project boundaries
Source of data:	Forest inventory from a proxy area in the same region, representing the same forest type and age class, distinguishing commercially viable stocks on the basis of species and tree size, referencing local expert knowledge of harvest practices and markets National and forest type-specific or eco-region-specific Forest Type: Secondary forest<20 years; Source: Census Monte Libano; PMPi: *0*
Description of measurement methods and procedures to be applied:	Merchantable biomass will be estimated by census.
Frequency of monitoring/recording:	Must be monitored at least every 5 years or if verification occurs on a frequency of less than every 5 years examination must occur prior to any verification event
Value applied:	Instance-stratum: PMPi ML1ASP-1: 0
Monitoring equipment:	Ex-ante a time zero measurement shall be made of this factor
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	Bolivian regulation only allows harvesting of trees with DBH >50cm

Data / parameter:	Regional Forest Cover / Non-Forest Cover Benchmark Map

Data unit:	
Description:	Map showing the location of forest land within the reference region at the beginning of the crediting period
Source of data:	Landsat-5 image in combination with GPS data collected during ground truthing
Description of measurement methods and procedures to be applied:	The minimum map accuracy should be 90% for the classification of forest/non-forest in the remote sensing imagery If the classification accuracy is less than 90% then the map is not acceptable for further analysis. More remote sensing data and ground truthing data will be needed to produce a product that reaches the 90% minimum mapping accuracy.
Frequency of monitoring/recording:	At a minimum three times over the ten years leading up to baseline renewal
Value applied:	
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	

Data / parameter:	Project Forest Cover Benchmark Map
Data unit:	
Description:	Map showing the location of forest land within the project area at the beginning of each monitoring period. If within the Project Area some forest land is cleared, the benchmark map must show the deforested areas at each monitoring event
Source of data:	Landsat-5 image in combination with GPS data collected during ground truthing
Description of measurement methods and procedures to be applied:	The minimum map accuracy should be 90% for the classification of forest/non-forest in the remote sensing imagery. If the classification accuracy is less than 90% then the map is not acceptable for further analysis. More remote sensing data and ground truthing data will be needed to produce a product that reaches the 90% minimum mapping accuracy.
Frequency of monitoring/recording:	At a minimum every ten years prior to baseline renewal
Value applied:	
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	Where forest land contains more than one forest class, the map must be stratified into forest classes using module X-STR.

Data / parameter:	Project Forest Cover Monitoring Map
Data unit:	

Description:	Map showing the location of forest land within the project area at the beginning of each monitoring period. If within the Project Area some forest land is cleared, the benchmark map must show the deforested areas at each monitoring event
Source of data:	Landsat-5 image in combination with GPS data collected during ground truthing
Description of measurement methods and procedures to be applied:	The minimum map accuracy should be 90% for the classification of forest/non-forest in the remote sensing imagery. If the classification accuracy is less than 90% then the map is not acceptable for further analysis. More remote sensing data and ground truthing data will be needed to produce a product that reaches the 90% minimum mapping accuracy.
Frequency of monitoring/recording:	Must be monitored at least every 5 years or if verification occurs on a frequency of less than every 5 years examination must occur prior to any verification event
Value applied:	
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	Where forest land contains more than one forest class, the map must be stratified into forest classes using module X-STR.

Data / parameter:	Degradation PRA Results
Data unit:	
Description:	
Source of data:	PRA
Description of measurement methods and procedures to be applied:	The PRA shall consist of semi-structured interviews / questionnaires. The PRA shall evaluate whether the following activities may be occurring in the project area: -harvesting of fuel wood -harvesting of wood for charcoal production -timber harvest If ≥ 10% of those interviewed/surveyed believe that degradation may be occurring within the project boundary then the limited on-the-ground degradation survey shall be triggered An additional output of the PRA shall be a depth of penetration of degradation pressure. A maximum distance shall be recorded for penetration into the forest from access points (such as roads, rivers, already cleared areas) for the purpose of harvesting fuel wood, charcoal and/or timber. It is likely that differing distances shall exist for each degradation pressure. If multiple pressures exist in the same stratum the deepest depth of penetration shall be used to define Adeg,i
Frequency of monitoring/recording:	Every two years
Value applied:	PRA showed no activities occurring in the project area

Monitoring equipment:	
QA/QC procedures to be applied:	Standard quality control / quality assurance (QA/QC) procedures for forest inventory, including field data collection and data management, shall be applied
Calculation method:	
Any comment:	Ex-ante, an estimation shall be made of degradation in the with-project case. If the belief is that zero degradation will occur within the project boundaries then this parameter may be set to zero if clear infrastructure, hiring and policies are in place to prevent deforestation.

Data / parameter:	Result of Limited Degradation Survey
Data unit:	
Description:	
Source of data:	
Description of measurement methods and procedures to be applied:	Sampled by surveying several transects of known length and width across the access-buffer area (equal in area to at least 1% of ADeg,i) to check whether new tree stumps are evident or not.
Frequency of monitoring/recording:	Must to be repeated each time the PRA indicates a potential for degradation
Value applied:	PRA did not show it was required to be monitored
Monitoring equipment:	
QA/QC procedures to be applied:	Standard quality control / quality assurance (QA/QC) procedures for forest inventory, including field data collection and data management, shall be applied
Calculation method:	
Any comment:	Ex-ante, an estimation shall be made of degradation in the with-project case. If the belief is that zero degradation will occur within the project boundaries then this parameter may be set to zero if clear infrastructure, hiring and policies are in place to prevent deforestation.

Data / parameter:	Aburn,i,t
Data unit:	ha
Description:	Area burnt in stratum i at time t
Source of data:	GPS coordinates and/or Remote Sensing data
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Areas burnt shall be monitored at least every five years or if verification occurs on a frequency of less than every 5 years examination must occur prior to any verification event
Value applied:	
Monitoring equipment:	

Instance-stratum	Aburn,i,t
ML1ASP-1	0

QA/QC procedures to be applied:	Standard quality control / quality assurance (QA/QC) procedures for forest inventory, including field data collection and data management, shall be applied
Calculation method:	
Any comment:	Ex-ante, estimations of areas burned shall be based on historic incidence of fire in the Project region

Data / parameter:	ADefPA,i,t
Data unit:	Ha
Description:	Area of recorded deforestation in the project area in stratum i at time t
Source of data:	Remote sensing imagery
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	Must be monitored at least every 5 years or if verification occurs on a frequency of less than every 5 years examination must occur prior to any verification event
Value applied:	<table><tr><td>Instance-stratum</td><td>ADefPA,i,t</td></tr><tr><td>ML1ASP-1</td><td>0</td></tr><tr><td></td><td></td></tr></table>
Monitoring equipment:	
QA/QC procedures to be applied:	Standard quality control / quality assurance (QA/QC) procedures for forest inventory, including field data collection and data management, shall be applied
Calculation method:	
Any comment:	Ex-ante, an estimation shall be made of deforestation in the with-project case. If the belief is that zero deforestation will occur within the project boundaries then this parameter may be set to zero if clear infrastructure, hiring and policies are in place to prevent deforestation.

Data / parameter:	ADeg,i
Data unit:	Ha
Description:	Area potentially impacted by degradation processes in stratum i
Source of data:	GIS delineation and ground truthing
Description of measurement methods and procedures to be applied:	ADeg,i shall be composed of a buffer from all access points (access buffer), such as roads and rivers or previously cleared areas. The width of the buffer shall be determined by the depth of degradation penetration as defined as a PRA output
Frequency of monitoring/recording:	Must to be repeated each time the PRA indicates a potential for degradation
Value applied:	<table><tr><td>Instance-stratum</td><td>ADeg,i</td></tr><tr><td>ML1ASP-1</td><td>0</td></tr><tr><td></td><td></td></tr></table>

Monitoring equipment:	
QA/QC procedures to be applied:	Standard quality control / quality assurance (QA/QC) procedures for forest inventory, including field data collection and data management, shall be applied
Calculation method:	
Any comment:	Ex-ante, a limited survey can be used to determine a likely depth of degradation penetration

Data / parameter:	Api
Data unit:	Ha
Description:	Total area of degradation sample plots in stratum i
Source of data:	Ground measurement
Description of measurement methods and procedures to be applied:	The sampling plan must be designed using plots systematically placed over the buffer zone so that they sample at least 3% of the area of the buffer zone.
Frequency of monitoring/recording:	Must be monitored at least every 5 years or if verification occurs on a frequency of less than every 5 years examination must occur prior to any verification event
Value applied:	

Instance-stratum	Api
ML1ASP-1	0

Monitoring equipment:	
QA/QC procedures to be applied:	Standard quality control / quality assurance (QA/QC) procedures for forest inventory, including field data collection and data management, shall be applied
Calculation method:	
Any comment:	Ex-ante, an estimation should be made of area of plots. This should be set to exactly 3% of the buffer zone ADeg,i

Data / parameter:	CDeg,i,t
Data unit:	t CO2-e
Description:	Biomass carbon of trees cut and removed through degradation process in stratum i at time t
Source of data:	Field measurement
Description of measurement methods and procedures to be applied:	The diameter of all tree stumps is the designated plots will be measured and conservatively assumed to be the same as the DBH. If the stump is a large buttress, identify several individuals of the same species nearby and determine a ratio of the diameter at DBH to the diameter of buttress at the same height above ground as the measured stumps. This ratio will be applied to the measured stumps to estimate the likely DBH of the cut tree. The above and below ground carbon stock of each harvested tree must be estimated using the same allometric regression equation and root to shoot ratio used in the module for estimating the carbon pool in trees (CP-AB) in the baseline scenario. See detailed guidance in CP-AB for aboveground biomass estimation

Frequency of monitoring/recording:	Must be monitored at least every 5 years or if verification occurs on a frequency of less than every 5 years examination must occur prior to any verification event
Value applied:	<table><tr><td>Instance-stratum</td><td>CDeg,i,t</td></tr><tr><td>ML1ASP-1</td><td>0</td></tr><tr><td></td><td></td></tr></table>
Monitoring equipment:	
QA/QC procedures to be applied:	Standard quality control / quality assurance (QA/QC) procedures for forest inventory, including field data collection and data management, shall be applied
Calculation method:	
Any comment:	Ex-ante, an estimation shall be made of likely degradation in the with-project case. Such an estimation shall be based on rates of degradation in surrounding areas and the degree of protection that will be in place (e.g. forest guards) in the with-project case.

Data / parameter:	Aplanned,i
Data unit:	Ha
Description:	Total area of planned deforestation over the entire project lifetime for stratum i
Source of data:	GPS coordinates and/or Remote Sensing data and/or legal parcel records
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Must be examined at least every 5 years or if verification occurs on a frequency of less than every 5 years examination must occur prior to any verification event
Value applied:	<table><tr><td>Instance-stratum</td><td>Aplanned,i (has)</td></tr><tr><td>ML1ASP-1</td><td>235</td></tr><tr><td></td><td></td></tr></table>
Monitoring equipment:	
QA/QC procedures to be applied:	Standard quality control / quality assurance (QA/QC) procedures for forest inventory, including field data collection and data management, shall be applied
Calculation method:	
Any comment:	Ex-ante, Aplanned,i shall be determined as described in BL-PL

Data / parameter:	AdefLK,i,t
Data unit:	Ha
Description:	The total area of deforestation by the baseline agent of the

	planned deforestation in stratum i at time t
Source of data:	Analysis of Remote Sensing data and/or legal records and/or survey information for lands owned or controlled or previously owned or controlled by the baseline agent of deforestation,
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	Must be reexamined at least every 5 years or if verification occurs on a frequency of less than every 5 years examination must occur prior to any verification event
Value applied:	<table><tr><td>Instance-stratum</td><td>AdefLK,i,t (has)</td></tr><tr><td>ML1ASP-1</td><td>0</td></tr><tr><td></td><td></td></tr></table>
Monitoring equipment:	
QA/QC procedures to be applied:	Standard quality control / quality assurance (QA/QC) procedures for forest inventory, including field data collection and data management, shall be applied
Calculation method:	
Any comment:	Legal records will include government permits to deforest including concession licenses Ex-ante, project proponents shall determine and justify the likelihood of leakage based on characteristics of the baseline agent or class of agent

3.3 Description of the Monitoring Plan

The following tasks will be undertaken

1. The baseline scenario will be reviewed every ten years.
2. Monitor carbon stocks and greenhouse gas emissions
3. Estimation of ex-post net carbon stock changes and greenhouse gas emissions
4. Monitor leakage and greenhouse gas emissions

Baseline scenario

Task	**Description**
Technical description of the monitoring	This involves updating every 10 years the parameters which remain fixed during the following 10 years. These parameters are obtained from the literature or from

task	changes to the legal system and or methodology.
Data to be collected: list of data and parameters	a. Total area of planned deforestation b. Carbon fraction of dry matter c. Allometric equations d. Root to shoot ratio e. Biomass conversion and expansion factor f. Fraction of wood products that will be emitted to the atmosphere between 5 and 100 years after production g. Fraction of wood products that will be emitted to the atmosphere h. Fraction of extracted biomass effectively emitted to the atmosphere during production i. Commercial volume as a percent of total aboveground volume j. Likelihood of deforestation k. Factor for calculating the biomass of dead wood created l. Factor for calculating the emissions arising from the creation of logging infrastructure m. Mean merchantable biomass as a proportion of total aboveground tree biomass for each forest type n. Volume of timber projected to be extracted from within the project boundary o. Emission factor p. combustion factor
Overview of data collection procedures	The data will be determined from IPCC guidelines whenever possible to ensure high degree of quality control and quality assurance.
Quality control and quality assurance procedure	Preference will be given to IPCC guidelines for determining values to ensure quality control and assurance.
Data archiving	All data will be digitalized, stored at different locations and stored for at least 2 years beyond the crediting period as required under section 3.18.1 of the VCS Standard v3.3.
Organisation and responsibilities of the parties involved in all the above	All responsibilities will fall on the project proponent.

Frequency	The frequency will be every 10 years.

Monitoring carbon stocks

Task	**Description**
Technical description of the monitoring task	To monitor the carbon stocks permanent nested sample plots constructed for validation will be used. These nested plots were constructed as follows. A sample of random points within each instance was generated. Using excel random function to generate random coordinates within a square encompassing the project area. All points outside project area were discarded. All points inside project area to obtain desired number of points were discarded using the following simple rule: select the closest two points; discard northern most; repeat until number of points is reduced to the desired number. Each random point will be the south west corner of a square sample plot of side 35 meters. The sides will be parallel to the North, South East and West directions. Each of these random coordinates mark the SW corner of a square plot of side 35m.The sides are parallel to the North-South and East-West directions. Relative to the SW corner, the following plots are identified

Plot type	**Minimum CBH**	**Coordinates relative to the SW corner in meters**
1	>=150	(0,0),(35,0),(35,35),(35,0)
2	>=60	(0,0),(20,0),(20,35),(0,35)
3	>=20	(0,0),(3,0),(3,35),(0,35)
4	Non-tree (>0)	(0,0),(1,0),(1,1),(1,0)

In each nested plot types 1 to 3, the DBH up to the nest's minimum DBH was measured. Using algometric equations, the above ground biomass of each tree was determined. Adding all of the trees biomass scaled by the following factors to account for the difference in plot area

CBH	Plot Area (m2)	Factor

	<table><tr><td>>=150</td><td>1225</td><td>1</td></tr><tr><td>>=60</td><td>700</td><td>1.75</td></tr><tr><td>>=20</td><td>105</td><td>11.66</td></tr></table> we obtained the total aboveground carbon stock of each plot and by virtue of Eq. 5 of VMD0001 (CP-AB) we also obtained the total belowground carbon stock for each sample plot. In addition, we obtained using Eq 3 Of VMD0005 (CP-W) the carbon stock in the wood products. In each nested plot type 4 we cut to the ground all woody biomass with CBH less than 5 cm. The representative samples were stored and allowed to dry for 5 days. . The combined samples are weighed to obtain the dry weight. Use of Eq. 13 of VMD0001 (CP-AB) allows the estimation of the belowground non-tree carbon stock. We then constructed a spatial series or array for each of the following quantities a. carbon stock in the aboveground tree biomass b. carbon stock in the belowground tree biomass c. carbon stock in the wood products d. carbon stock in the aboveground non-tree biomass e. carbon stock in the belowground non-tree biomass f. carbon stock change in the aboveground tree biomass g. carbon stock change in the belowground tree biomass h. carbon stock change in the aboveground non-tree biomass i. carbon stock change in the belowground non-tree biomass *For each spatial series we obtain the mean and the standard deviation.* *As time increases we are able to estimate the carbon stock changes in time.*
Data to be collected: list of data and parameters	*For each plot and within each nested plot the following will be collected* a. minimum allowed DHB, b. area of nested plot
Overview of data	a. The area of each nested plot will be measured using compass and

collection procedures	measuring tape b. minimum allowed DHB in each nested plot will be measured using measuring tape at a height of 1.3m.
Quality control and quality assurance procedure	To ensure quality control and quality assurance the following tasks will be taken a. The coordinate of the SW corner common to all nested plots will be verified, b. The area of each nested plot will be measured, c. The integrity of the marks will be verified and repaired if necessary. d. A random set of plot corners will be measured and verified trough photography. e. A random set of trees will be measured and verified trough photography.
Data archiving	All data will be digitalized, stored at different locations and stored for at least 2 years beyond the crediting period as required under section 3.18.1 of the VCS Standard v3.3.
Organisation and responsibilities of the parties involved in all the above	All responsibilities for the fieldwork will fall upon the project proponent who will be accompanied by a team of 5 additional persons to carry out this task.
Frequency	The frequency will be every 10 years or less.

Monitoring ex-post degradation

Task	**Description**
Technical description of the monitoring task	This monitoring involves two aspects. a. Degradation through fire and deforestation b. Degradation by illegal logging and illegal wood collection Their monitoring involves different technologies. The first one is monitored by satellite imagery from Landsat 5. The area deforested is initially determined by comparison between each instance's validated satellite image and that used for monitoring. The comparison is done after unsupervised classification of the images. From this comparison the affected area is measured. If the area is greater than zero than a truthing on the ground is done and the area determined using GPS

	measurements. The remaining carbon stocks immediately following deforestation are deemed to be de minimis and the non-CO2 emissions determined through Eq. 1 of VMD0013. For degradation by illegal logging and illegal wood collection, we first carry out a PRA to determine if such activity takes place. The names of the people living in the area and who are interviewed are not taken in order to ensure their willingness to give out accurate sensitive information. If it does, new sample plots are constructed in the affected areas and the change in carbon stock is measured using the same procedure used for monitoring carbon stocks.
Data to be collected: list of data and parameters	For degradation through fire and deforestation satellite imagery from Landsat-5 will be used. The data obtained from imagery will be the area deforested and/or burnt. For degradation by illegal logging and illegal wood collection a PRA will be carried out with the following questions. a. How far do you leave from nearest instance? b. Nearest Instance c. Do you go to Instance? d. Do you log illegally? e. Do you know someone that log illegally? f. Have you ever or plan to log in nearest instance? g. Do you know anybody that has you ever or plans to log in nearest instance? h. Do you collect wood illegally? i. Do you know someone that collect wood illegally? j. Have you ever or plan to collect wood in nearest instance? k. Do you know anybody that has you ever or plans to collect wood in nearest instance? l. If yes were does the activity take place within the instance? If 10% or more answers that there are illegal activities being carried out, the PRA will trigger the verification on the ground of such activities. The place indicated by the interviewee will be inspected and delimited. Within that area, sample plots will be constructed and the amount of carbon removed will be measured by estimated the

	DBH of the trees removed using the same procedure for monitoring carbon stocks. The carbon stock removed through degradation processes will be obtained.
Overview of data collection procedures	Satellite imagery will be obtained from http://www.inpe.br/ with cloud cover less than 10% over the instance. The PRA will be carried out through visitation of individuals in the surrounding area or in situ at the instance.
Quality control and quality assurance procedure	Satellite imagery will be inspected for integrity. The PRA will be conducted anonymously but location of survey will be noted and random samples verified. For carbon stocks, photography will be used to document measurements.
Data archiving	All data will be digitalized, stored at different locations and stored for at least 2 years beyond the crediting period as required under section 3.18.1 of the VCS Standard v3.3.
Organisation and responsibilities of the parties involved in all the above	Imagery collection and analysis will be responsibility of the project proponent. All responsibilities for the fieldwork will fall upon the project proponent who will be supervise a team of 4 additional persons to carry out the PRA. Carbon stock monitoring in degraded areas by illegal activities will be as in the carbon monitoring task.
Frequency	The frequency of PRA and degradation through illegal logging and wood collection will be every 2 years. Degradation through deforestation and fire will be monitored every year.

Monitoring leakage

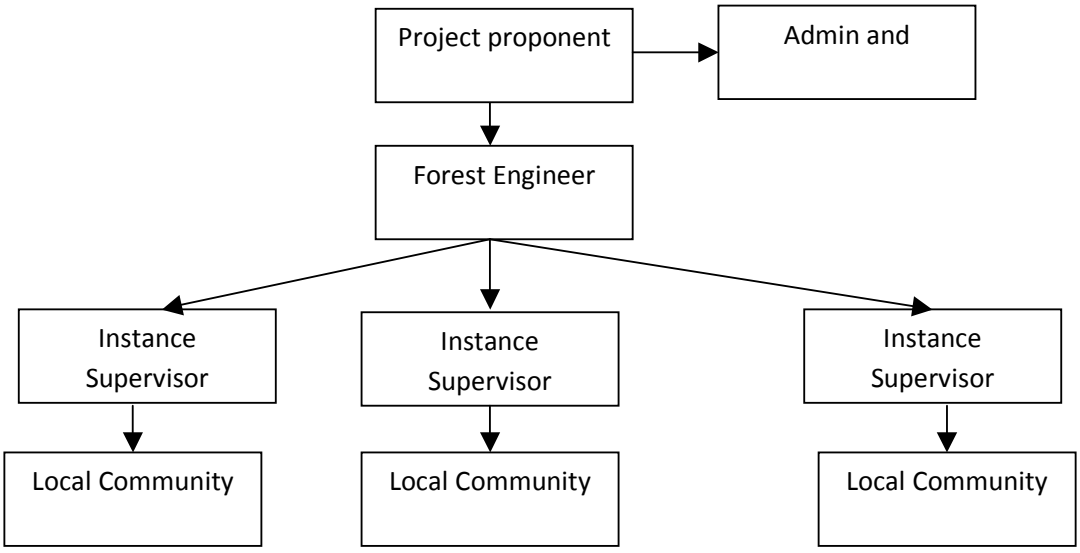
Task	**Description**
Technical description of the monitoring task	The monitoring involves two subtasks a. Leakage from activity shifting b. Leakage from market effects The leakage from activity shifting involves two steps. First we determine through land registries if the deforestation agent has any other "rural" properties. If so, we obtain their coordinates and monitor deforestation through satellite imagery. If deforestation occurs, we assume that any post deforestation carbon stock is de minimis For leakage due to market effects we monitor through proxy or directly, the

	percentage of merchantable carbon stock to total carbon stock and compare it to the long term ratio to determine the factor.
Data to be collected: list of data and parameters	For activity shifting we will survey land registries for rural properties in the name of relevant deforestation agents and satellite imagery for any rural property from project start date and at monitoring date. For market effect, we will survey a conservative proxy area within an instance to determine the Merchantable biomass as a proportion of total aboveground tree biomass and compare it's long term trend from peer reviewed lliterature.
Overview of data collection procedures	The land registry will be queried for records and satellite imagery will be obtained from http://www.inpe.br/ with cloud cover less than 10% over the instance. Surveys for merchantable volume will be obtained from the ABT or forest engineer will be used to survey a representative area of at least 100 hectares to determine the carbon stock of the merchantable volume. Total biomass will be conservatively determined from national estimates for similar type of forests.
Quality control and quality assurance procedure	Satellite imagery will be inspected for integrity. Documentation from the land registry will be in its original form. Surveys for merchantable volume will be obtained from the ABT or carried out by forest engineers and a random sample verified.
Data archiving	All data will be digitalized, stored at different locations and stored for at least 2 years beyond the crediting period as required under section 3.18.1 of the VCS Standard v3.3.
Organisation and responsibilities of the parties involved in all the above	Imagery collection and analysis will be responsibility of the project proponent. Legal documentation will be responsibility of the project proponent. Government documentation will be responsibility of the project proponent.
Frequency	Activity shifting leakage will be monitored every 5 years. Market effects leakage will be monitored every 10 years.

There will also be a part time forest engineer in the city of Riberalta to supervise the instance supervisor's work. These permanent employees will be responsible for each instance. When two or more instances are within a 15 km radius and their combined area is less than 2500 has, the instance supervisor's will have responsibility over all those instances falling within that radius.

The instance supervisor's will reside at the instance and will be tasked with monitoring the instances to ensure that human activity that can lead to degradation is minimal, alert to the presence of fire and coordinate actions to put out fires. The instance supervisor's will also be responsible for managing the project to enrich with endangered and vulnerable species. S/he will also be liasing with seed and saplings suppliers as well as local neighbours who will be employed to carry out the physical task of planting the saplings. An accounting and administration team based in the city of Riberalta will aid this team.

Below is a diagram showing reporting lines



Non-conformities will be address directly by the project proponent ensuring that there is a hands on management and a flat reporting structure on any and all situations that can lead to a potential loss of carbon stock. All employees including those enriching the forest will have direct access to the project proponent to ensure this important aspect is fulfilled.

4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

The DBH of trees in each permanent sample plot was measured. The above and below biomass was determined using relevant allometric equations. The uncertainty was determined to be 17.6% at the 95 CL. The total baseline emissions are as follows

Strata	BSLTotal biomass carbon stock	BSL post-deforestation Total biomass carbon stock	BSL Carbon stock sequestered in wood products in the baseline in stratum	Aplanned	GHG	Net greenhouse gas emissions in the baseline from planned deforestation
1	277	0	0	235	5,922	71,102

Total						**71,102**

4.2 Project Emissions

Monitoring carbon stocks

Given the short 1-year monitoring period, forest growth was de minimis and measurement of the permanent plots showed growth to be within measurement error (ΔDBH<1cm).

Monitoring ex-post degradation

Degradation through fire and deforestation.

a. Data sources and pre-processing:

Type of data source	Remote sensors: Satellite images
Resolution	30m x 30m per pixel
Source	Landsat 5
Acquisition date	20011020, 20100607
Path	233/068
Format	Geotiff
Corrrections	Geometric. Alignment with LandSat 7, path 233/068 acquisition date: 20040630
Bands	Band 1: 0.52 - 0.52µm, Band 2: 0.52 - 0.60µm and Band 3: 0.63 - 0.69µm
Projection and parameters used to geo-reference the images	LandSat 7 and source were first visually aligned near project area. Afterwards they both were clipped to include project area and later classified by cluster into two categories. Images were overlaid to minimize difference about landmarks such as rivers and roads.
Error estimate of geometric correction	<1 pixel.
Cloud cover	No cloud and shadow was required due to the absence of clouds
Software	Arcgis v 10.1

Type of data source	Remote sensors: Satellite images
Resolution	23.5m x 23.5m per pixel
Source	ResourceSat-1 P6. Sensor LIS III
Acquisition date	20100815, 20120804
Path	310/085
Format	Geotiff
Corrrections	Geometric. Alignment with LandSat 7, path 233/068

	acquisition date: 20040630
Bands	Band 2: 0.52-0.59µm, Band 3: 0.62-0.68µm and Band 4: 0.77-0.86µm
Projection and parameters used to geo-reference the images	LandSat 7 and source were first visually aligned near project area. Afterwards they both were clipped to include project area and later classified by cluster into two categories. Images were overlaid to minimize difference about landmarks such as rivers and roads.
Cloud cover	No cloud and shadow was required due to the absence of clouds
Error estimate of geometric correction	<1 pixel.
Software	Arcgis v 10.1

b. Data classification:

Images	ResourceSat-1 P6 20100815, 20120804
Classes	Forest Non-forest
Categories	Deforestation Fire Other
Classification Approach	Visual inspection of imagery following step 5.2 of GOFC-GOLD 2008 Sourcebook for REDD
Coordinates and description of the ground-truth data collected for training purposes	DBH diameters from sampling plots were used for ground-truthing. Plots where geo-referenced and compared with pixel value.

c. Classification accuracy assessment*:

Images	ResourceSat-1 P6 20100815, 20120804
Estimate emissions or removals related to each activity; forest land remaining as forest, and conversion from forest to grassland.	*Forest Land Remaining Forest Land.* Growth was negligible and conservatively omitted. Biomass loss-mass was monitored and shown to be nil with zero uncertainty (all trees still standing). Average annual increase in carbon due to biomass increment in forest land remaining forest land by forest type and climatic zone is nil. *Forest Land Converted to Grassland.* Annual area of land converted to grasslands was shown to be zero without any uncertainty. Thus Annual change in carbon stocks in living biomass as a result of land use conversion to grassland from some initial land use is nil.
Assessment of uncertainties	Carbon fraction default value was used did not produce

related to both activities.	percentage uncertainty. Forest growth did produces percentage uncertainty. Forest land did not change and did not produce percentage uncertainty. Converted land was nil and did not produce percentage uncertainty. Therefore Forest Land Remaining as Forest percentage uncertainty and Forest Land Converted to Grassland are both zero.
Assessment of the total uncertainties from the LULUCF sector	Since both Forest Land Remaining as Forest percentage uncertainty and Forest Land Converted to Grassland have zero percentage uncertainty, the total uncertainty is also zero.
Combination of LULCF uncertainties with other source categories.	No other sources of uncertainties were monitored.

* Follows step 6 of GOLD 2008 Sourcebook for REDD and chapter 5.2.4 of IPCC Good Practice Guidance 2003.

d. Changes in Data sources and pre-processing / Data classification:

Change from LandSat-5 to ResourceSat-1 (P6)	Landsat-5 imagery for the baseline year (2011) was used. Unfortunately this satellite was removed from service that same year. ResourceSat-1 imagery with reasonable cloud cover was not available for that year. Therefore imagery from 2010 was used to cross correlate between Landsat-5 and ResourceSat-1.
Cross correlation	Both LandSat-5 (20100607) and P6 (20100815) images were geo-referenced with geo-referenced Landsat-7 image. Visual inspection showed that both images showed, pixel by pixel, the same land cover. ResourceSat-1
Software	Arcgis v10.1

Degradation by illegal logging and illegal wood collection. A PRA was carried out between March 15 2013 and April 15 2013. 25 people in total were interviewed. These lived in one of the three surrounding communities: Los Cajuces, Santa Lurdes and La Nueva Union. Of the three communities, only Los Cajuces was visited. The remaining interviewees passed through the project area between the above dates. The interviewees were asked all the questions required by the sampling plan. Names were not taken to ensure interviewees were free to talk without suffering repercussions from their answers. Their answers confirm unanimously that there was no illegal deforestation, logging or wood collection activities in the project area.

Project emissions were nil.

4.3 Leakage

Activity shifting leakage.. To determine the activity shift, land registry records were extracted during the monitoring period that showed that the deforestation agent did not own any rural properties. Furthermore, the project proponent did interview the deforestation agent and confirmed that he did not own any rural properties that could be legally deforested and that he had not sought permission to deforest from the authorities.

Market leakage. This was fixed at validation and determined to be zero.

No leakage of any kind was observed. Project leakage is nil

4.4 Summary of GHG Emission Reductions and Removals

The total GHG emissions reduction and removals are

GHG emissions reduction and removals	GHG emission reductions or removals (tCO2e)
Baseline Emissions	71,102
Project Emissions	0
Leakage	0
Total	**71,102**

The project uncertainty at the 95% CI is 17.6%.This factor is greater than 15% and therefore yiedls reduces the number of VCUs to 69,250.

The overall risk rating is 16% equivalent to 11376 VCUs.

5 ADDITIONAL INFORMATION

Additional Calculation Details Particular To Instance ML1ASP

Here the additional calculation details particular to instance ML1ASP are listed.

a. Field measurements estimates of Non-tree biomass were less than 2 tCO2e per hectare and were discarded from the calculations as allowed under T-SIG.

b. The project proponent, in line with table 2 of VM0007, has omitted non-tree biomass because the end use of the converted forest is pastures for cattle related activities. Therefore the post deforestation non-tree biomass is zero and the pre deforestation is at least zero. Therefore under table 2 of VM0007 the project proponent is allowed to omit the contribution of non-tree biomass.

c. All other carbon stocks omitted from the calculations are inline with table 2 and table 3 of VM0007 and are listed in section 2.3. For the avoidance of doubt, T-SIG is not invoked to omit them.

d. Steps 1 and 2 of the module M-MON that are used in section 3.2 to calculate project emissions were omitted in the calculation. This omission follows from the fact that the validation and verification images used in step 1 are the same. Thus Area of recorded deforestation in the project area stratum i converted to land use u at time t is the same in both cases and no change has occurred between validation and verification. In addition, since the images are the same, any algorithm would yield the same results for processing, post processing and accuracy assessment. This argument applies equally to deforestation, fire degradation and carbon stock enhancement.

e. Leakage, as set out in section 3.3 above has two sources, leakage by the deforestation agent and market effects leakage. Documents from the land registry of the Beni Department show that the deforestation agent has no rural land. In addition, the amount of wood that could be potentially harvested is insufficient to tempt a logging company to move infrastructure such as skidders, manpower, etc. to the project area. The costs would always be greater than the gains and in addition, logging companies have better areas to harvest that are closer to logistic hubs such as Riberalta. Thus the market leakage is zero because the amount of volume of timber projected to be extracted from within the project boundary during the baseline in stratum i at time t that is used in section 1 of VMD00011 (LK-ME) is zero. This last point, follows from the fact that a logging company was already active in the area during the last half of the 1990's. Thus all trees suitable for harvesting are only the seeding trees left from that harvest.

f. Leakage. Because there is no history of deforestation and no verifiable plans for controlled lands and future-controlled lands then WoPR in step 1 of section 3.3 was set to planned baseline rate for the project (D%planned * Aplanned from the planned deforestation baseline module). This makes the value of equation 4 in LK-ASP equal to zero. The total area of deforestation by the baseline agent of the planned deforestation is zero and therefore the value of equation 5 using the value found in 4 is zero. Because land registry records show that the deforestation agent does not have any properties that can be deforested it follows that in step 4 no biomass burning nor application of fertilizers took place. Therefore equation 6 is also zero. Finally, because the

i. area of activity shifting leakage,

ii. greenhouse gas emissions as a result of leakage of avoided deforestation activities and

iii. net greenhouse gas emissions due to leakage to peatlands as a result of implementation of a planned deforestation project

are all zero, equation 1 of LK-ASP is also zero. This is reflected in step 5 of section 3.3 above.