FLORESTAL SANTA MARIA PROJECT (FSM-REDD PROJECT) NON-PERMANENCE RISK REPORT

in association with VO2 Desenvolvimento Empresarial

Prepared by PLANT Environmental Intelligence
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NON-PERMANENCE RISK REPORT FSM

Document Prepared by PLANT Environmental Intelligence
According to VCS "AFOLU Non-Permanence Risk Tool"
Version 3, Procedural Document, 8 March 2011

1 INTERNAL RISK

Project Management		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	Not applicable: the project does not involve plantations.	0
b)	Not applicable: GHG credits have not been previously issued.	0
c)	Management team includes individuals with significant experience in all skills necessary to successfully undertake all project activities.	0
d)	Management team maintains a presence in the country and is located less than a day of travel from the project site, considering all parcels or polygons in the project area.	0
e)	Mitigation: Management team includes individuals with experience in AFOLU project design and implementation, carbon accounting and reporting under the VCS Program or other approved GHG programs. The Management team is composed among others by some experienced people in the field of Carbon Markets and forestry. PLANT Environmental Intelligence has prepared the Monitoring Plan and Guidelines for the Management Team to follow during the implementation of the project. This will serve as a framework to be followed by the Project Proponent's technical team throughout the project period. The FSM management team is composed of **Rubens Forbes Alves de Lima (CEO)** • Shareholder in the company Bela Aliança S.A.; • Major shareholder in Florestal Santa Maria Participações S.A.; • Former owner of company Transportadora Translor, leading transport and logistics solutions company in Brazil, Sold to Ryder System Inc; • Works with cattle genetics: Bonsmara (South African Breed) in Mato Grosso do Sul; • CEO of Florestal Santa Maria SA, working with sustainable forest management since 2002. **Marcelo Martins Lunardelli** • Currently working in the company of family G. Lunardelli; • Minor shareholder in Florestal Santa Maria Participações S.A.;	0

	• Manager of Logistics in company Ryder System Inc in Brazil, in the operation of supply chain of General Motors plants in Brazil and Argentina; • Administrative Director of Florestal Santa Maria SA, also responsible for the area of Governmental Relations with environmental agencies since 2002. **Sebastião Carvalho Vilas Boas (CFO)** He holds an Accounting and Business Administration degree, a MBA for Project Management at FGV and a MBA for Business Management (Trevisan). Has over 20 years of experience in High Management Controlling, experience in National and Multinational companies in high positions, focused on Management and Business Drivers. **Antonio Martins Lima Filho (COO)** Economist with post-graduation in administration and a master degree in Transport Engineering. Experience of more than 20 years in the Supply field, working as General Manager in multinational company in the metal recycling industry; extensive experience in design, construction and implementation of industrial and logistics. 18-year experience as a consultant and manager in the field of large-scale logistics and transportation. Large experience in design, construction and implementation of industries and logistic systems. The technical aspects of the FSM project activity will be supported by the following team: **Warwick Manfrinato** is an agronomist and engineer, graduated at the University of São Paulo 1989 (*www.esalq.usp.br*), and achieved a M.Sc. at the Center for Nuclear Energy in Agriculture 1999 (CENA, University of São Paulo), where he studied isotope ecology applied to soil carbon in forest dynamics. He is currently leading an environmental consultancy company, Plant Environmental Intelligence (*www.plantBR.com.br*). In 1999-2000 was a staff member of Winrock International in Brazil as the country manager for the Natural Resources Management Division. From the years 2000 to 2005 he was an associate researcher at the Laboratory for Chemistry, Cellulose and Energy (LQCE - *www.lqce.esalq.usp.br*), as well as a member of the Climate Change group at the Center for Advanced Studies on Applied Economics (CEPEA - *www.cepea.esalq.usp.br*), both at the University of Sao Paulo (*www.esalq.usp.br*). He is also a founding member of the “Amazonia in Transformation” initiative, a network of information built at the Institute for Advanced Studies at the University of São Paulo (IEA - *www.iea.usp.br/amazoniea.htm*). As a consultant he has assisted, among other organizations, the World Bank, UN Earth Council, the government of Costa Rica and companies such as SGS-Forestry, EcoSecurities, Natsource and CantorFitzgerald. In Brazil he has provided advisory to the Ministry of Environment, State Governments of Amazonas, Bahia and Sao Paulo. In recent years he developed strategic projects for CVRD-Headquarters, Dedine S/A, The Gilberto Freire Foundation, The Coca-Cola Company (USA), Instituto Coca-Cola Brasil and Brazilian Forum on Climate Change. Since 2003 he has been an invited member to the official Brazilian Delegation to the UNFCCC-COP/MOP. **Janaina Dallan MBA.**- Carbon markets specialist. Working in the coordination of projects related to sustainability strategy and projects to the Clean Development Mechanism. Has a Bachelor degree in Forestry Engineer and a Masters in Business of the environment. Carbon markets specialist based in São Paulo working specifically in the carbon credit development department being responsible of managing the Brazilian projects and participating as a reviewer of projects in other countries, was part of the international Carbon Assets Team of Ecofys. Working with Carbon Market issues since 2002 when she worked with the Center for Advanced Studies on Applied Economics at the University of São Paulo while participating in two projects directed by the Ministry of the Environment. Ms. Dallan later managed CDM projects and Carbon market activities at the company Golder	

	Associates São Paulo and provided support to other Golder offices throughout Latin American countries and North America. She has also worked as a Carbon Markets consultant for an Energy company being responsible for the implementation of the CDM department including staff training, project advisor and staff coordination. **Luiz Fernando de Moura.** – Forestry Engineer, M.Sc. and Ph.D. in Wood technology by the Université Laval (Quebec, Canadá). He is responsible to coordinate the technical group at PLANT Environmental Intelligence, working with projects for the Carbon Markets including Forestry projects. Dr. de Moura had participation in the preparation of "Energia Verde Carbonization Project - Mitigation of Methane Emissions in the Charcoal Production of Grupo Queiroz Galvão, Maranhão, Brazil", registered on March 21, 2011. Complete CVs are available to auditors.	
f)	Mitigation: Adaptative management plan in place Management plan includes strategic bases in place equipped via mobile phone and motorcycle, daily report from teams with daily extraction reports, The property management is in place and uses ABSOLUT system from SINOP applied to FSM. *www.absolutsistemas.com.br* The Forestry Census is inserted into the system and it has a registry of every tree of the project area. The program gives support to the sustainable management plan in accordance with FSC procedures. It also complies with federal and state law. As a strategy for looking after the property and assure the project, it was considered the following assumptions: 1-Avoid entry of outsiders: 1.1 Hunters 1.2 Fishermen 1.3 Intrusion 1.4 Prevention of invasion 1.5 Fire Prevention 1.6 Support the Work of Sustainable Forest Management Plan 2 - Consolidation of calm and peaceful possession 3-Cleaning of frontiers and its milestones 4-Internal organization of communication On top of these issues, there is strategic plan with seven fixed bases located in strategic locations to meet the above assumptions, namely: BASE 1 - SEDE This base possesses the administrative office of the farm, main house (residence for Directors, Officers and invited guests), kitchen and dining hall. This base is equipped with electricity (including a generator), satellite internet, fixed and mobile telephone (both by means of an external aerial) and a motorcycle. BASE 2 – LINHA 12 This base possesses lodgement for collaborators, dining hall, toilets, one house for the fixed employee, building for storage and maintenance of machinery, and logging deck. This base is equipped with electricity, mobile telephone (by means of an external aerial), and a motorcycle. BASE 3 - ARIPUANÃ This base possesses one house for the fixed employee, dining hall and kitchen for visitors.	-2

	This base is equipped with electricity (by means of a generator), mobile telephone (by means of an external aerial), and a motorcycle. BASE 4 - ACAMPAMENTO This operational base possesses three houses: two houses are lodgements with toilets and one house has a kitchen, dinning hall, storage room, office, toilets and two bedrooms. This base is equipped with electricity (by means of a generator), and a motorcycle. BASE 6 – LINHA 6 This base possesses a house for the fixed employee. This base is equipped with solar electricity, and mobile telephone (by means of an external aerial). BASE 7 - PACUTINGA This base possesses a house for the fixed employee. This base is equipped with solar electricity, and mobile telephone (by means of an external aerial). BASE 8 - MORERU This base possesses a house for the fixed employee, with accommodation for 3 people. This base is in charge of the gate to the road Colniza / Moreru. This base is equipped with solar electricity, mobile telephone (by means of an external aerial), and a motorcycle. All bases communicate 24 hours, the Manager of BASE 1 is authorized for any decision making and action. BASES 2, 3 and 4 report to BASE 1 BASES 6 and 7 report to BASE 8 To be able to receive the authorization to perform a sustainable management of the forest (so called AUTEX) the property was obligated to have a sustainable management plan in place and present it to the competent environmental agency – Secretary of State for the Environment of the State of Mato Grosso – SEMA / MT. The Management Plan is fully available to auditors.	
Total Project Management (PM) [as applicable, (a + b + c + d + e + f)] Total may be less than zero.		**-2**

Financial Viability		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	This is not the case in the present project.	0
b)	This is not the case in the present project.	0
c)	This is not the case in the present project.	0
d)	Project cash flow breakeven point is less than 4 years from the current risk assessment. Financial spreadsheet available to auditors. Financial healthy evidence is available to auditors.	0
e)	This is not the case in the present project.	0

f)	This is not the case in the present project.	0
g)	This is not the case in the present project.	0
h)	Project has secured 80% or more of funding needed to cover the total cash out before the project reaches breakeven. The project owner is already in conversations to establish a VERPA (Voluntary Emissions Reductions Purchase) of the 2009-2010 carbon project credits. It means that around 1.568.760 VCUs are already under negotiations at a price not less than US$ 4.00. The other next two to three years of the credits are in negotiation with a multinational company to buy the credits at a price not less than US$ 5.00. Moreover, the proponent has independent wealth and alternative means to generate income from his property. This will provide a buffer if the carbon market performs poorly. These confidential documents – VERPA and Memorandum of Intention are available to auditors. Risk of technical failure Very low, as the project has limited technical requirements from this point. No advancements in technologies or maintenance of technical systems are required for the project's success.	0
i)	This is not the case in the present project.	0
Total Financial Viability (FV) [as applicable, ((a, b, c or d) + (e, f, g or h) + i)] Total may not be less than zero.		**0**

Opportunity Cost		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	This is not the case in the present project.	0
b)	This is not the case in the present project.	0
c)	This is not the case in the present project.	0
d)	This is not the case in the present project.	0
e)	This is not the case in the present project.	0
f)	"*NPV from project activities is expected to be at least 50% more profitable than the most profitable alternative land use activity*": The NPVs calculated for the Project Case are **R$ 130.52 / hectare**, and **R$ 126.93 / hectare** (the former value refers to a VCU price of US$ 5.85 / tCO_2; the latter value refers to a conservative exchange rate of R$ 1.46 / US$). Both NPVs estimated for the Project Case, based on a discount rate of 12.7 %, are much more profitable than those observed for the BAU activities: i) The most profitable alternative land use activity, coffee cultivation, has a negative NPV estimated in **-R$ 1,500.36** (average value of two production scenarios; obtained for a 12.7 % discount rate by linear interpolation of values presented in "Table A 1.5", page 30 of	-4

	ARÊDES and PEREIRA, 2008). According to the Additionality Analysis of this VCS-PD, the coffee cultivation provided the highest IRRs among all land uses assessed. However, the discount rate of 12.7 % (used for NPV calculation of the Project Case) makes this BAU activity financially unfeasible (i.e. negative NPV). ii) The activity of pasture, as demonstrated in the Additionality Analysis of this VCS-PD, is usually less profitable than coffee cultivation. For this activity, SCHNEIDER et al. (2000) reports negative NPV for a discount rate of 6 %, based on data presented in Table 7, page 44. Thus, for the discount rate adopted for comparisons in this analysis (12.7 %), the NPV of pasture would be even more negative. iii) For the combined alternative land use (90% of pasture and 10% of coffee cultivation), the NPV, calculated with the 12.7 % discount rate, would also be negative, given that both BAU activities (pasture and coffee cultivation) have negative NPVs for this discount rate. In the context explained above, it is concluded that the NPV from Project Case can be at least 50% more profitable than the most profitable alternative land use activity. (Coffee cultivation NPV) ARÊDES, A. F.; PEREIRA, M. W. G. Análise econômica da produção de café arábica: um estudo de caso com simulações de Monte Carlo para sistemas de baixa e alta produtividade. Informações Econômicas, SP, v.38, n.4, abr. 2008. (Average of two production scenarios.) (Pasture NPV) SCHNEIDER et al. Amazônia Sustentável: limitantes e oportunidades para o desenvolvimento rural. Brasília: World Bank; Belém: Imazon, 2000. 58 pp.	
g)	This is not the case in the present project.	0
h)	This is not the case in the present project.	0
i)	*Mitigation: Project is protected by legally binding commitment to continue management practices that protect the credited carbon stocks over at least 100 years.* Legal document registered at 6th Notary Service and Real Estate Registry[1]. Book 2, enrolment number 73.958, sheet 130. Full version Available to auditors. This document contains the official disclaimer dated of July 24, 2001 when: AV-03-73958 – According to the Responsibility Term of Maintenance of Management Forest - TRMFM [2] dated December/07/2002, between the owners of this property: G.	0

[1] 6º Serviço Notarial e Registro de Imóveis da Terceira Circunscrição Imobiliária
[2] Termo de Responsabilidade de Manutenção de Floresta Manejada

	Lunardelli S / A-AGRICULTURE TRADE AND COLONIZATION, legal entity of private law, registered under CNPJ No. 58.133.638/0001-80, established at Avenida Paulista, No. 1.776, 16th Floor, Suite B. Bela Vista, São Paulo-SP, testified before the competent authorities, which relies on the forest laws and environmental regulations, that the forest or the existing vegetation in the area of 70,000.00 hectares, becomes as an area of restricted use, where, in this area, it can only have interference as forestry in the form of Sustainable Forest Management, as authorized by IBAMA[3]. The current owner undertakes for himself, his heirs or successors. Thus, the Project is protected by a legally binding agreement, however the agreement is not found to be sufficient to demonstrate legally binding commitment for a 100 year period.	
Total Opportunity Cost (OC) [as applicable, (a, b, c, d, e or f) + (g or h)] Total may not be less than 0.		**0**

Project Longevity		
a)	This is not the case in the present project.	0
b)	With legal agreement or requirement to continue the management practice Legal document registered at 6th Notary Service and Real State Registry[4]. Book 2, enrolment number 73.958, sheet 130. Full version Available to auditors. This document contains the official disclaimer dated of July 24, 2001 when: AV-03-73958 – According to the Responsibility Term of Maintenance of Management Forest - TRMFM [5], dated December/07/2002, between the owner of this property: G. Lunardelli S / A-AGRICULTURE TRADE AND	30 – (30/2)

[3] IBAMA - Brazilian Institute of Environmental and Renewable Resources
[4] 6º Serviço Notarial e Registro de Imóveis da Terceira Circunscrição Imobiliária
[5] Termo de Responsabilidade de Manutenção de Floresta Manejada

	COLONIZATION, legal entity of private law, registered under CNPJ No 58.133.638/0001-80, established at Avenida Paulista, No. 1.776, 16th Floor, Suite B. Bela Vista, São Paulo-SP, testified before the competent authorities, which relies on the forest laws and environmental regulations, that the forest or the existing vegetation in the area of 70,000.00 hectares, becomes as an area of restricted use, where, in this area, it can only have interference as forestry in the form of Sustainable Forest Management, as authorized by IBAMA[6]. The current owner undertakes for himself, his heirs or successors.	
Total Project Longevity (PL) May not be less than zero		**15.0**

Internal Risk	
Total Internal Risk (PM + FV + OC + PL) Total may not be less than zero.	**((-2)+(0)+(0)+(15.0)) = 13.0**

2 EXTERNAL RISKS

Land Ownership and Resource Access/Use Rights		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	Ownership and resource / use rights are held by the same entity(s) Florestal Santa Maria S/A (FSM) is the only owner of the property and it holds all the legal rights, including rights for using property resources. Ownership documentation is available to auditors. The project proponent assumes that there are no significant risks associated with mining inside the FSM farm. According to data from DNPM (Departamento Nacional de Produção Mineral; National Department of Mineral Production;	0

[6] IBAMA

	http://sigmine.dnpm.gov.br/webmap/), only 3.9% of the total FSM area has availability of minerals (gold). However, no mining license has been requested and no interest in mining has been expressed so far. It is believed that the amount of mineral resources available in the FSM farm would not justify investments in mining.	
b)	This is not the case in the present project.	0
c)	This is not the case in the present project. Documents from FUNAI are available for consultation by the auditors.	0
d)	This is not the case in the present project. Documents from FUNAI are available for consultation by the auditors.	0
e)	Mitigation: Project area is protected by legally binding commitment to continue management practices that protect carbon stocks over the length of the project crediting period – Legal document registered at 6th Notary Service and Real Estate Registry[7]. Book 2, enrolment number 73.958, sheet 130. Full version Available to auditors. This document contains the official disclaimer dated of July 24, 2001 when: AV-03-73958 – According to the Responsibility Term of Maintenance of Management Forest - TRMFM [8] dated December/07/2002, between the owners of this property: G. Lunardelli S / A-AGRICULTURE TRADE AND COLONIZATION, legal entity of private law, registered under CNPJ No. 58.133.638/0001-80, established at Avenida Paulista, No. 1.776, 16th Floor, Suite B. Bela Vista, São Paulo-SP, testified before the competent authorities, which relies on the forest laws and environmental regulations, that the forest or the existing vegetation in the area of 70,000.00 hectares, becomes as an area of restricted use, where, in this area, it can only interfere as forestry in the form of Sustainable Forest Management, as authorized by IBAMA[9]. The current owner undertakes for himself, his heirs or successors.	-2
f)	Not applicable: disputes over land tenure, ownership or access/use rights do not exist inside the project area.	0
Total Land Tenure (LT) [as applicable, ((a or b) + c + d + e+ f)] Total may not be less than zero.		**0**

[7] 6º Serviço Notarial e Registro de Imóveis da Terceira Circunscrição Imobiliária
[8] Termo de Responsabilidade de Manutenção de Floresta Manejada
[9] IBAMA

Community Engagement		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	This is not the case in the present project.	0
b)	Less than 20 percent of households living within 20 km of the project boundary outside the project area, and who are reliant on the project area, have been consulted. Given the lack of a more complex and detailed analysis on this topic, the project proponent attributed the maximum score for this item. FSM has informed the farm workers about the project and about its relevant importance to keep the forest, jobs, natural resources etc.	5
c)	Mitigation: The project generates net positive impacts on the social and economic well-being of the local communities who derive livelihoods from the project area. FSM has on its south frontier a rural community, from this community 19 people work at FSM directly, these people have 4 to 6 members in the family, so many families are benefiting from the farm and when the project is implemented more people will be needed as work force. The project will include the implementation of certain activities with a view to obtaining the necessary instruments and institutional support to ensure that forest management continues in the property and that leakage will be mitigated: Fire brigades: Fire brigades will be organized from local labour. Those in favour of the objectives put forward by the project (preservation of natural resources and the continuation of forest management) will be included in training courses and may become a source of income for the local community. New Technical School: Project participants, in partnership with the local city hall, will structure a new technical school to qualify those who have finished high-school to become spotters, choppers, and forestry equipment operators. Florestal Santa Maria will be a case study for this effort, the objective of which will be to qualify labour that finds little opportunity to work in the region and ends up taking part in illegal settlements and land occupation. Forest management: Courses on forest management methods will be offered to the local community. This may lead to the qualification of people who can work in the proposed project. Support to SEMA-MT: SEMAT/MT will benefit from having, under its jurisdiction, an innovative model that can be replicated in other properties. It will provide the current administration with more visibility and methodological advances in environmental preservation. Two surveillance posts will also be placed around Florestal Santa Maria and new cars will be purchased, with a view to ensuring security at the project site and surrounding areas. Potential Roll-out to Other Areas: Other areas with the potential to be included	-5

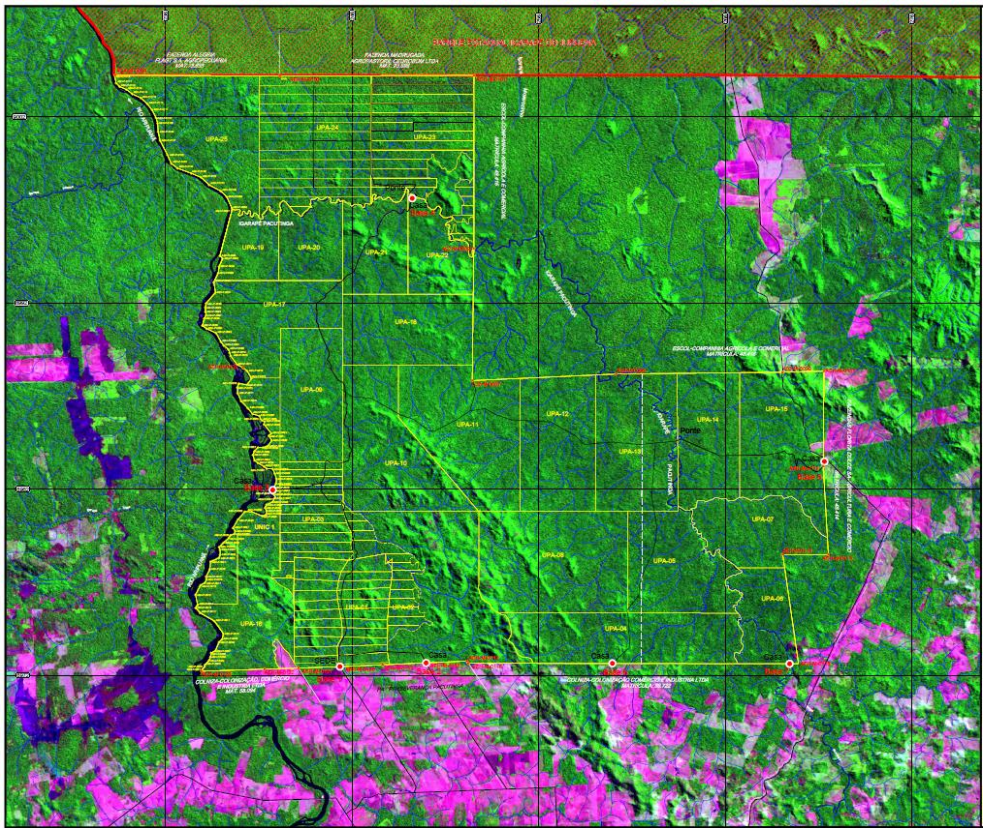
	in REDD projects have already been identified around the project site, which will favour and encourage forest conservation by means of financial incentives obtained from reduced emission sales and provide social and environmental benefits to neighbouring communities. Fight against illegal land occupation: The local community will be paramount in monitoring illegal land occupation and potential illegal logging. Those who are favourable to being trained and conducting local monitoring will be included in the project and may also become a new source of income for the communities. Feasibility study for a small non-wood product processing plant: This initiative will measure the property's potential to produce non-wood products (such as fruit, oils and essences). If this activity is proven to be feasible, additional labour may be added, creating new income opportunities for the local population and developing new forest-use methods.	
Total Community Engagement (CE) [where applicable, (a+b+c)] Total may be less than zero.		**0**

Political Risk		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	This is not the case in the present project.	0
b)	This is not the case in the present project.	0
c)	Governance score of -0.32 to less than 0.19 (0.01)	2
d)	This is not the case in the present project.	0
e)	This is not the case in the present project.	0
f)	Mitigation: The country has an established Designated National Authority under the CDM and has at least one registered CDM Afforestation/Reforestation project See: *http://www.mct.gov.br/index.php/content/view/317381.html* Moreover, Brazil has been a leader in the establishment of the REDD framework at international level.	-2
Total Political (PC) [as applicable ((a, b, c, d or e) + f)] Total may not be less than zero.		**0**

External Risk	
Total External Risk (LT + CE + PC) Total may not be less than zero.	**((0)+(0)+(0)) = 0**

3 NATURAL RISKS

Fire (F)	
Significance	According to the risk map of burning areas in the state of Mato Grosso, the municipality of Colniza, where the project area is inserted, the risk of natural fire is classified as “minimum” and In the project area there is a record for the whole project area for more than 40 years, and, according to it, there have been only 6 events of natural fire resulting in less than 5% loss of carbon stocks. **Floresta Amazônica: Dinâmica, Regeneração e Manejo.** Claude Gascon e Paulo Moutinho. Ministério da Ciência e Tecnologia, Manaus, 1998. *http://sigma.cptec.inpe.br/queimadas/risco_est.html*
Likelihood	The likelihood of fire in the project area is every 10 to less than 25 years, according to the area history.
Score (LS)	1
Mitigation	To mitigate the project owner keeps fire-control bases in strategic places and since 1940 has implemented firebreaks also in strategic places. There are 7 bases, all bases communicate 24 hours, the Manager of BASE 1 is authorized for any decision making and action. BASES 2, 3 and 4 report to BASE 1 BASES 6 and 7 report to BASE 8 The bases are located in the following coordinates: Base 1 X = 245233.4261 Y = 8972576.1083 Base 2 X = 249878.2857 Y = 8972780.2206 Base 3 X = 241654.8488 Y = 8982064.1489 Base 4 X = 249131.9247 Y = 8997734.9982 Base 6 X = 259855.0000 Y = 8972764.0000 Base 7 X = 269348.0000 Y = 8972730.0000 Base 8 X = 271211.0000 Y = 8983602.0000

	On the following map it can be shown the locations of the bases (red dots) 

Pest and Disease Outbreaks (PD)	
Significance	**No loss**
Likelihood	Risk is not applicable to the project area There is no record of Pest and Disease outbreaks in the area since the area is a natural forest in its equilibrium where it is hardly believed to have a pest or disease outbreak. A Scientific Opinion letter was provided by Dr. Jean Ometto (INPE; *Instituto Nacional de Pesquisas Espaciais*; National Space Research Institute). This letter is available for consultation by the audit team. According to Scientific Opinion by Dr. Jean Ometto (INPE): "*Regarding the disease and pest outbreaks in tropical humid forests, it is sound to belief that due to the high species diversity and resilience, these ecosystems have a strong capability to adapt and react to any specific single pathogen, insect, or pest (in general terms) that could develop into broadly spread damage to the vegetation, with consequent carbon loss. There is not scientific evidence on this sort of outbreaks in highly diverse tropical humid forests vegetation in Mato Grosso or other region in the Amazon, which could be different in single tropical species plantation (Nair, 2001).*"

Score (LS)	0
Mitigation	None

Extreme Weather (W)	
Significance	**No loss** **There is no record of any extreme event in the area for more than 80 years. The area is not affected by hurricanes, floods etc.**
Likelihood	Risk is not applicable to the project area
Score (LS)	0
Mitigation	None

Geological Risk (G)	
Significance	**No loss**
Likelihood	Not applicable to the project area The project area is located in a stable geological area with no faults. The risks of carbon losses related to geological phenomena are more prone to occur in steeply sloped landscapes, which is not the case in the FSM farm (predominantly flat landscape). In steeply sloped areas, biomass loss can occur through earthquake-induced landslides. Even in these cases, previous studies (ALLEN et al. 1999) show that much of an earthquake's immediate impact is low-intensity damage to forests. ALLEN et al. (1999) quantified the immediate impact of an earthquake (magnitude index MW 6.7 in 1994). Brazil has a mild seismic activity: earthquakes are predominantly of low intensity varying between 2 and 4 degrees Richter. The highest earthquake recorded in the country occurred in 1955 in the State of Mato Grosso (6.6 degrees Richter) (TOMINAGA et al. 2009). Thus, the average earthquakes in Brazil are not likely to produce significant losses of forest biomass. Moreover, according to REN et al. (2009), the occurrence an earthquake-induced landslide must comply with the combination of a series of factors, comprising soil mechanics, vegetation transpiration and root mechanical reinforcement, and hydrological processes. In this context, there are strong reasons to reject the possibility of any significant vegetation damage caused by earthquakes in the FSM region. Literature cited: ALLEN, ROBERT B., PETER J. BELLINGHAM, AND SUSAN K. WISER. 1999. IMMEDIATE DAMAGE BY AN EARTHQUAKE TO A TEMPERATE MONTANE FOREST. Ecology 80:708–714. [doi:http://dx.doi.org/10.1890/0012-9658(1999)080[0708:IDBAET]2.0.CO;2]

	REN, D.; WANG, J; FU, R.; KAROLY, D.J.; HONG, Y.; LESLIE, L.M.; FU, C.; HUANG, G. 2009. Mudslide-caused ecosystem degradation following Wenchuan earthquake 2008. GEOPHYSICAL RESEARCH LETTERS, v. 36, L05401, doi:10.1029/2008GL036702 TOMINAGA, L.K.; SANTORO, J.; AMARAL, R. DESASTRES NATURAIS: Conhecer para prevenir. Instituto Geológico, Governo do Estado de São Paulo, 2009.
Score (LS)	0
Mitigation	None of the above

Blow-Down Wind (ON)	
Significance	**No loss (0.004%)**
Likelihood	Less than every 10 years A Scientific Opinion letter was provided by Dr. Jean Ometto (INPE; *Instituto Nacional de Pesquisas Espaciais*; National Space Research Institute). This letter is available for consultation by the audit team. According to Scientific Opinion by Dr. Jean Ometto (INPE): "*1. The occurrence of blow-down in response to strong wind gasps, are natural and randomic occurrence in mature forests in the Tropical Amazon. According to Nelson et al (1994) few quantification of large scale blow-down, derived from convectional storms, had been reported in the literature, at that time. More recently, Laurance (2003) associated the increase of blow-down occurrence in areas where the forest is fragmented and Gloor et al (2009) reaffirmed, highlighting that large scale (more than 30ha) blow-down are rare and unpredictable events in preserved, primary forest.* *2. Nevertheless the occurrence of blow-down is considered in the scientific literature. Malhi et al (2003) highlight that the forest patches under disturbance, from a blow-down event, are under recovery processes by a succession of local plant species, to which is conceivable to assume that the net biome production is zero. Which means that the carbon released by the dead of the trees is absorbed by the growth of the new plants, composing the stand biomass. This process is modulated by the resilience of the system.* *3. Thus, biomass loss is negligible, once such disturbance does not export any material from the area, as it would occur if timber were harvest.*"
Score (LS)	0
Mitigation	None

Score for each natural risk applicable to the project (Determined by (LS × M)	
Fire (F)	(1 x 0.5) = 0.5

Pest and Disease Outbreaks (PD)	(0 x 1) = 0
Extreme Weather (W)	(0 x 1) = 0
Geological Risk (G)	(0 x 1) = 0
Other natural risk (ON)	(0 x 1) = 0
Total Natural Risk (as applicable, F + PD + W + G + ON)	**0.5**

4 OVERALL NON-PERMANENCE RISK RATING AND BUFFER DETERMINATION

4.1 Overall Risk Rating

Risk Category	Rating
a) Internal Risk	13
b) External Risk	0
c) Natural Risk	0.5
Overall Risk Rating (a + b + c)	**13.5**

4.2 Calculation of Total VCUs

Year	REDD Benefits (buffer included) (tCO_2)	REDD Benefits (buffer excluded) (tCO_2)	Buffer discount (13.5%)	Buffer return (15% of total buffer discount)	Annual Net REDD benefits (tCO_2)	Accumulative Net REDD benefits (tCO_2)
2009	785,562.1	679,511.2	106,050.9		679,511.2	679,511.2
2010	1,065,159.1	921,362.6	143,796.5		921,362.6	1,600,873.8
2011	1,037,700.7	897,611.1	140,089.6		897,611.1	2,498,484.9
2012	939,876.4	812,993.1	126,883.3		812,993.1	3,311,478.0
2013	908,477.0	785,832.6	122,644.4		785,832.6	4,097,310.6
2014	908,792.1	786,105.2	122,686.9		786,105.2	4,883,415.8
2015	908,792.1	786,105.2	122,686.9		786,105.2	5,669,521.0
2016	908,792.1	786,105.2	122,686.9		786,105.2	6,455,626.1
2017	909,570.6	786,778.5	122,792.0		786,778.5	7,242,404.7
2018	909,570.6	786,778.5	122,792.0	169,547.6	956,326.2	8,198,730.8
2019	909,728.2	786,914.9	122,813.3		786,914.9	8,985,645.7
2020	909,728.2	786,914.9	122,813.3		786,914.9	9,772,560.6
2021	909,728.2	786,914.9	122,813.3		786,914.9	10,559,475.4
2022	909,728.2	786,914.9	122,813.3		786,914.9	11,346,390.3
2023	909,728.2	786,914.9	122,813.3	92,106.8	879,021.6	12,225,411.9
2024	909,728.2	786,914.9	122,813.3		786,914.9	13,012,326.8
2025	926,264.2	801,218.5	125,045.7		801,218.5	13,813,545.3
2026	944,661.0	817,131.8	127,529.2		817,131.8	14,630,677.0
2027	945,426.8	817,794.1	127,632.6		817,794.1	15,448,471.2
2028	945,426.8	817,794.1	127,632.6	93,875.1	911,669.3	16,360,140.4
2029	945,584.4	817,930.5	127,653.9		817,930.5	17,178,070.9
2030	945,584.4	817,930.5	127,653.9		817,930.5	17,996,001.4
2031	945,584.4	817,930.5	127,653.9		817,930.5	18,813,931.8
2032	945,584.4	817,930.5	127,653.9		817,930.5	19,631,862.3
2033	945,584.4	817,930.5	127,653.9	95,737.2	913,667.7	20,545,530.0
2034	945,584.4	817,930.5	127,653.9		817,930.5	21,363,460.4
2035	945,584.4	817,930.5	127,653.9		817,930.5	22,181,390.9
2036	945,584.4	817,930.5	127,653.9		817,930.5	22,999,321.4
2037	945,584.4	817,930.5	127,653.9		817,930.5	23,817,251.8
2038	945,584.4	817,930.5	127,653.9		817,930.5	24,635,182.3
2039	101,625.1	87,905.7	13,719.4	116,946.4	204,852.1	**24,840,034.4**

The areas exploited inside the FSM farm from 13rd April 2009 to 31st December 2011 were excluded from the calculation of VCU benefits. This is due to the fact that these areas were not previously certified by the FSC (Forest Stewardship Council) and, consequently, were not eligible to the Project, according to M-MON v2.0. The documents showing the areas exploited within this time period are available for consultation by auditors and will be kept in a secure retrievable manner for at least two years after the end of the project crediting period.