MONITORING REPORT FORM (CDM-MR) *
Version 01 - in effect as of: 28/09/2010

CONTENTS

* as contained within the document entitled "Guidelines for completing the monitoring report form (CDM-MR)" (EB 54 meeting report, annex 34).

MONITORING REPORT
VERSION 1:– 05/11/2010
REFORESTATION AS RENEWABLE SOURCE OF WOOD SUPPLIES FOR INDUSTRIAL USE IN BRAZIL - CDM A/R Project 2569
Monitoring period No. 01 - 10/11/2000 – 09/11/2010

SECTION A. General description of the project activity

A.1. Brief description of the project activity: >>

>> This Monitoring Report refers to an Afforestation and Reforestation project activity, currently registered under the UNFCCC as Project Activity 2569 "Reforestation as a renewable source of wood supplies for industrial use in Brazil", PDD version 3a and uses the methodology A/R-AM0005, version 1, "Afforestation and reforestation project activities for industrial and/or commercial uses".

The establishment of plantations as a renewable source of energy for industrial needs is expected to result in a twofold benefit to the climate: (i) generation of carbon stocks and GHG removals by sinks additional to those that would occur in the absence of such plantations, and (ii) use of sustainable sources of biomass in place of fossil fuels and non-renewable biomass to reduce GHG emission in one of Brazil's major industrial sector, i.e. the iron and steel industry. Both of the above mentioned benefits are given attention by the project entity through the implementation of an integrated project[1] that encompasses both types of activities and climate related benefits. Considering the integrated nature of the projects but also the differences in the methodologies falling under the decisions 19/CP.9 and decision 17/CP.7, the project design documents of each component were prepared for separate submission, as supported by the respective baseline and monitoring methodologies.

The A/R-CDM Project 2569 relies on sustainable production practices and advanced plantation technology developed by the project entity. The plantations are managed using sustainable management practices under the Forestry Stewardship Council certification. The production of cloned sprouts in large-scale nurseries and localized irrigation systems are designed to make the use of water and other inputs more efficient. The fire protection policies and infra-structure and the setting aside of preservation areas enhance the biodiversity of the project area (an area which represent 1/3 of the project area are set aside for conservation purposes).

The project entity started the implementation of A/R-CDM Project 2569 on 10 November 2000, which is adopted as the starting date for this project activity. The table below shows the planting schedule actually implemented by the project entity.

Table 1: area planted in MG03 and MG04 farms for the project activity

Year of planting	Area planted MG03/MG04 (ha)
2000	302.55
2001	1,177.01
2002	3,243.04
2003	3,133.95
2004	2,819.53
2005	965.98
TOTAL	**11,642.06**

[1] The project entity's CDM industrial project activity is treated under AM0082 "Use of charcoal from planted renewable biomass in the iron ore reduction process through the establishment of a new iron ore reduction system" and is undergoing validation.

The total net anthropogenic GHG removals by sinks achieved in this monitoring period are 4,884,820 tCO_2e.

A.2. Project Participants

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- Plantar S/A Planejamento, Técnica e Administração de Reflorestamentos
- International Bank for Reconstruction and Development as a Trustee of the Prototype Carbon Fund
- The Netherlands

A.3. Location of the project activity:

>> The project activity is located in the municipalities of Felixlândia and Morada Nova de Minas, State of Minas Gerais, Brazil (refer to **Annex 1** for the complete list of stands and its coordinates).

Region	Unit Number	Plantation Farm Name	Overall geo-referenced points
Felixlândia	MG03[2]	Jacaré/Riachão	- Northeast extreme point: 18º36'19S/ 45º00'38W - Southeast extreme point: 18º40'15S/ 44º59'41W - Northwest extreme point: 18º35'30S/ 45º07'07W - Southwest extreme point: 18º43'19S/ 45º06'22W
Morada Nova de Minas	MG04[3]	Buriti Grande	- West extreme point: 18º47'52S/ 45º23'32W - Northeast extreme point: 18º41'07S/ 45º14'35W - Southeast extreme point: 18º47'48S/ 45º17'07W

A.4. Technical description of the project

>> The following features illustrate the technology employed by the A/R-CDM Project 2569:

- *Research and Development*: The project entity has established a research and development program aimed at providing high-yielding eucalyptus clones. With the objective of producing quality and productive sprouts, empirical field experiments are conducted using advanced scientific protocols. The rigorous selection process and propagation methods assure the production of quality cloned sprouts for plantation purposes**.**

- *Reproduction of cloned sprouts*: Mini-sprouts are selected from sprout matrices, developed in the field experiments, and propagated in a plantation nursery that is fully equipped with clone gardens, water recycling devices and greenhouses with electronic controls for temperature and moisture. The production process of the sprouts take approximately 100 days. After this period of time, the sprouts are taken to the field for planting.

- *Planting process*: The planting process involves minimum cultivation techniques, which minimizes soil impacts and optimizes the use of water. Fertilizers, herbicides and pest control substances are used as per recommended by silviculture practices. A summary of the planting process and its basic activities are listed below:

  a) The selection of the area to be planted;
  b) Division of stands and fire breaks;
  c) Area cleaning;

[2] Project Boundary Area: 6,412.02 ha in 2010

[3] Project Boundary Area: 5,231.26 ha in 2010

d) Ant prevention;
e) Soil preparation;
- Fertilization
- Definition and digging of planting lines
f) Planting

- *Harvesting Process:* in general, the project entity adopts the full harvesting for its harvesting activities, which is completely mechanized. The harvesting process occurs with the use of a tractor called feller. Dragging of the cut trees out of the stand is executed with a skidder. Slashing of trees, which consists of the slashing the merchantable volume of the tree, is executed with a machine called "Garra Traçadora" (Slasher Claw). These three harvesting operation activities occur in the following order:
    1) Harvesting;
    2) Dragging;
    3) Slashing

- *Productivity management practices* are implemented to ensure that the expected production results are monitored since the first planting months in a scientifically devised inventory system. The survival rates of plantings are monitored. Whenever early results indicate lower survival rates, the affected areas are replanted. To minimize the risk of fires, the project entity maintains ongoing vigilance at strategically located fire-watch towers. Fire monitoring is conducted in conjunction with fire-fighting brigades.

- *Quality management system*: Operations are fully integrated into the project entity's quality management system, which follows ISO 9001 standards. Each operational procedure is registered, described and monitored as per norms and standard operational procedures. Social and environmental aspects are managed by a specific department within the project entity in order to ensure compliance with legislation, corporate principles, and forestry certification schemes.

A.5. Title, reference and version of the baseline and monitoring methodology applied to the project activity:

>> A/R Project 2569 is based on baseline methodology A/R-AM0005, version 1, **"Afforestation and reforestation project activities for industrial and/or commercial uses"**.

In addition, this project activity adopts the procedures and guidance of the version 02 of the "**Tool for the Demonstration and Assessment of Additionality in A/R CDM Project Activities**"[4].

A.6. Registration date of the project activity:

>> The registration date for A/R Project 2569 is 21 July 2010.

A.7. Crediting period of the project activity and related information (start date and choice of crediting period):

>> A/R-CDM Project 2569 adopts a fixed 30-year crediting period and uses the **tCER** approach to account for the net anthropogenic GHG removals by sinks. The 30-year fixed crediting period would cover the duration between 10 November 2000 and 09 November 2030.

A.8. Name of responsible person(s)/entity(ies):

>> The responsible for completing the monitoring report form is Plantar Carbon Ambiental Ltda, contact information plantarcarbon@plantar.com.br and phone number ++ 55 31-3290.4032. Plantar Carbon is a recently established company and is part of The Plantar Group.

[4] Annex 17, EB 35.

SECTION B. Implementation of the project activity

B.1. Implementation status of the project activity

>> The starting of A/R-CDM Project 2569 consists of the period in which the project entity started the establishment of plantations (planting activities in the field). In response to the CDM, the project entity commenced implementation of this A/R project activity on 10 November 2000, which is adopted as its starting date. The table below shows the planting activities starting date in each project site.

Farm	Starting date of plantings
MG03	10/11/2000
MG04	06/08/2003

The plantation establishment activities under this project activity follow a seven-year-rotation period (up to 28 years) as per the productivity parameters and production practices for eucalyptus in Brazil followed by two harvesting cycles at 7-year intervals from the planting. The second harvesting rotation is expected to result from coppicing. As the second and last harvesting occurs, new plantations would need to be established to replace the exhausted stock as the productivity rate of the coppice phase is expected to decline in relation to the planting phase and the most updated genetic material used for sprout production. However, the harvesting and consequently the planting calendar are determined by the market demand and fluctuations and may vary throughout time. The project entity's plantations initiated in 2000 and continued until 2005. Part of the harvesting took place at the seventh year, but some stands had to be harvested in advance due to specific circumstances, such as strong winds that damaged the young eucalyptus trees, plagues and other managerial needs (see **Table 2** for the detailed list of events). Also, great part of the plantations were kept standing due to the economic crises that swept the world in late 2008. Following the crises the pig iron mill had to shut down its blast furnaces to keep up with the market slowdown. This circumstance influenced the cycles of harvesting/planting, once the project activity's forests are destined to supply the project entity's pig iron mill with renewable charcoal. The project activity's estimation of net anthropogenic GHG removals by sinks for 2010 was presented in Section A.9 of the PDD as 2,440,967 tCO_2e and is actually 4,884,820 tCO_2e in 2010 (refer to Section E, item E.6 for detailed information). Although some stands can be harvested in advance in response to specific circumstances e.g. fires, winds, plague, charcoal produced from these stands is not considered for GHG emission reductions account under the industrial component.

During this first monitoring period fire occurrences, caterpillar plagues and other events caused an early harvesting of some stands. All stands affected were replanted or managed from coppice. These occurrences are detailed monitored and registered and will be presented to the DOE during verification.

The complete list of stands within the A/R-CDM Project 2569 boundary is presented in **Annex 1** and significant events that resulted in anticipated harvesting are listed in **Table 2**.

Table 2: significant events occurring during the first monitoring period

UNISE	Project	Stand ID	Area	Planting date	Planting year	Cycle	Rotation	Harvesting date	Age	Management	Replanting Date	Event
MG03	Buritis	02	51.75	11/28/2000	2000	1	2	15/02/08	7.22	COPPICING		Harvesting planning
MG03	Buritis	03	48.90	3/14/2001	2001	2	1	11/10/07	6.58	REPLANTING	18/01/08	Psilideo-Concha
MG03	Buritis	05	26.25	1/8/2001	2001	1	2	14/05/05	4.35	COPPICING		Winds
MG03	Buritis	05A	27.03	1/8/2001	2001	1	2	14/05/05	4.35	COPPICING		Winds
MG03	Buritis	06	57.74	11/10/2000	2000	1	2	11/02/05	4.26	COPPICING		Winds
MG03	Buritis	07	50.74	11/12/2000	2000	2	1	02/03/07	6.30	REPLANTING	10/01/08	Psilideo-Concha
MG03	Buritis	07A	2.32	11/12/2000	2000	2	1	02/03/07	6.30	REPLANTING	09/01/08	Psilideo-Concha
MG03	Buritis	08	22.26	11/16/2000	2000	1	2	20/06/05	4.59	COPPICING		Winds
MG03	Buritis	08A	3.92	11/16/2000	2000	1	2	12/03/07	6.32	COPPICING		Harvesting planning
MG03	Buritis	09	59.36	12/18/2000	2000	2	1	25/04/07	6.35	REPLANTING	15/01/08	Psilideo-Concha
MG03	Buritis	10	60.49	1/12/2001	2001	1	2	31/12/05	4.97	COPPICING		Winds
MG03	Buritis	11	38.00	12/17/2001	2001	1	2	11/03/08	6.24	COPPICING		Harvesting planning
MG03	Buritis	12	48.98	1/31/2002	2002	1	2	29/10/08	6.75	COPPICING		Harvesting planning
MG03	Buritis	13	18.96	12/27/2001	2001	1	2	28/03/08	6.25	COPPICING		Harvesting planning
MG03	Buritis	14	30.26	2/28/2002	2002	2	1	05/04/10	8.10	REPLANTING	To be replanted	Replacement-Productivity
MG03	Buritis	15	59.99	4/6/2001	2001	1	2	03/10/07	6.50	COPPICING		Harvesting planning
MG03	Buritis	16	63.39	4/15/2001	2001	2	1	03/08/07	6.30	REPLANTING	23/01/08	Psilideo-Concha
MG03	Buritis	18	16.51	2/13/2002	2002	2	1	15/03/10	8.09	REPLANTING	To be replanted	Replacement-Productivity
MG03	Buritis	19	24.93	2/15/2002	2002	1	2	8/15/2010	8.50	COPPICING		Harvesting planning
MG03	Buritis	20	32.00	2/20/2002	2002	2	1	21/12/08	6.84	REPLANTING	To be replanted	Replacement-Productivity
MG03	Buritis	22	30.65	12/26/2001	2001	1	2	13/10/08	6.80	COPPICING		Harvesting planning
MG03	Buritis	24	20.68	12/24/2001	2001	1	2	19/03/08	6.24	COPPICING		Harvesting planning
MG03	Buritis	25	52.67	11/21/2001	2001	2	1	27/02/08	6.27	REPLANTING	22/10/08	Psilideo-Concha
MG03	Buritis	26	52.11	11/15/2001	2001	2	1	08/05/08	6.48	REPLANTING	13/11/08	Winds
MG03	Buritis	27	37.06	2/26/2002	2002	1	2	20/10/08	6.65	COPPICING		Harvesting planning
MG03	Buritis	29	30.47	5/5/2001	2001	2	1	14/03/08	6.86	REPLANTING	12/03/09	Psilideo-Concha

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MG03	Buritis	31	45.26	5/10/2001	2001	2	1	21/11/07	6.54	REPLANTING	18/06/08	Replacement-Productivity
MG03	Buritis	32	44.77	5/16/2001	2001	2	1	12/11/07	6.50	REPLANTING	20/05/08	Replacement-Productivity
MG03	Buritis	33	33.95	5/24/2001	2001	2	1	03/11/07	6.45	REPLANTING	25/01/08	Ceratocystis
MG03	Buritis	34	35.09	5/30/2001	2001	2	1	19/10/07	6.39	REPLANTING	28/01/08	Psilideo-Concha
MG03	Buritis	35	27.97	7/10/2001	2001	2	1	30/11/07	6.39	REPLANTING	25/06/08	Replacement-Productivity
MG03	Buritis	36	22.41	10/25/2001	2001	1	2	07/07/08	6.70	COPPICING		Harvesting planning
MG03	Buritis	37	52.79	7/20/2001	2001	1	2	28/05/09	7.86	COPPICING		Harvesting planning
MG03	Buritis	38	37.36	6/22/2001	2001	1	2	29/02/08	6.69	COPPICING		Harvesting planning
MG03	Buritis	39	16.10	10/30/2001	2001	1	2	23/06/08	6.65	COPPICING		Harvesting planning
MG03	Buritis	39A	12.68	10/30/2001	2001	1	2	09/09/08	6.87	COPPICING		Harvesting planning
MG03	Buritis	40	28.87	11/1/2001	2001	2	1	10/03/08	6.36	REPLANTING	14/07/08	Psilideo-Concha
MG03	Buritis	41	39.59	12/29/2001	2001	1	2	30/06/08	6.51	COPPICING		Harvesting planning
MG03	Buritis	42	30.51	11/8/2001	2001	1	2	07/11/08	7.00	COPPICING		Harvesting planning
MG03	Buritis	43	32.27	12/20/2001	2001	1	2	26/10/08	6.85	COPPICING		Harvesting planning
MG03	Buritis	44	29.55	11/14/2001	2001	1	2	06/09/08	6.82	COPPICING		Harvesting planning
MG03	Buritis	45	29.85	11/1/2001	2001	2	1	28/06/08	6.66	REPLANTING	12/02/09	Winds
MG03	Buritis	46	38.91	3/19/2002	2002	2	1	03/07/10	8.30	REPLANTING	To be replanted	Winds
MG03	Buritis	46A	4.83	3/19/2002	2002	2	1	23/04/10	8.10	REPLANTING	To be replanted	Winds
MG03	Buritis	47	15.90	3/19/2002	2002	1	2	29/10/08	6.62	COPPICING		Harvesting planning
MG03	Buritis	48	40.07	3/12/2002	2002	1	2	15/12/08	6.77	COPPICING		Harvesting planning
MG03	Buritis	49	28.22	3/25/2002	2002	2	1	05/06/10	8.20	REPLANTING	To be replanted	Winds
MG03	Buritis	50	37.97	2/20/2002	2002	2	1	16/09/08	6.58	REPLANTING	04/03/09	Psilideo-Concha
MG03	Buritis	51	19.02	2/22/2002	2002	1	2	07/11/08	6.71	COPPICING		Harvesting planning
MG03	Jacaré	17	35.01	12/29/2002	2002	1	2	9/2/2010	7.68	COPPICING		Harvesting planning
MG03	Jacaré	51	23.85	10/10/2003	2003	1	2	18/08/06	2.86	COPPICING		Winds
MG03	Riachão	01	26.57	4/15/2002	2002	2	1	31/05/10	8.13	REPLANTING	To be replanted	Ceratocystis
MG03	Riachão	02	31.61	4/1/2002	2002	2	1	17/07/10	8.30	REPLANTING	To be replanted	Ceratocystis
MG03	Riachão	05	12.33	4/11/2002	2002	2	1	06/04/10	7.99	COPPICING		Harvesting planning
MG03	Riachão	06	43.89	4/23/2002	2002	2	1	01/12/06	4.61	REPLANTING	28/12/07	Replacement-Productivity

MG03	Riachão	07	26.25	4/25/2002	2002	1	2	23/04/10	8.00	COPPICING		Harvesting planning
MG03	Riachão	07A	6.08	4/25/2002	2002	1	2	23/04/10	8.00	COPPICING		Harvesting planning
MG03	Riachão	09	26.55	5/17/2002	2002	1	2	18/01/10	7.68	COPPICING		Harvesting planning
MG03	Riachão	10	42.96	5/24/2002	2002	2	1	27/02/08	5.77	REPLANTING	20/02/09	Ceratocystis
MG03	Riachão	100	35.60	10/28/2003	2003	2	1	26/08/08	4.83	REPLANTING	05/02/09	Replacement-Productivity
MG03	Riachão	11	18.77	5/30/2002	2002	1	2	15/09/06	4.30	COPPICING		Winds
MG03	Riachão	11A	26.14	5/30/2002	2002	1	2	15/09/06	4.30	COPPICING		Winds
MG03	Riachão	12A	6.24	6/30/2002	2002	2	1	22/02/08	5.65	REPLANTING	23/02/09	Fire
MG03	Riachão	14	45.76	5/22/2002	2002	1	2	16/05/06	3.99	COPPICING		Winds
MG03	Riachão	15	40.62	5/15/2002	2002	2	1	20/06/06	4.10	REPLANTING	26/12/07	Ceratocystis
MG03	Riachão	16A	14.96	9/4/2002	2002	2	1	25/02/08	5.48	REPLANTING	14/02/09	Fire
MG03	Riachão	17	26.45	7/30/2002	2002	2	1	06/03/08	5.61	REPLANTING	25/02/09	Fire
MG03	Riachão	18	34.63	6/17/2002	2002	2	1	07/08/06	4.14	REPLANTING	07/01/08	Replacement-Productivity
MG03	Riachão	19	25.72	6/26/2002	2002	2	1	26/07/06	4.08	REPLANTING	07/07/08	Replacement-Productivity
MG03	Riachão	20	31.47	6/12/2002	2002	1	2	06/06/06	3.99	COPPICING		Winds
MG03	Riachão	20A	2.55	6/12/2002	2002	1	2	06/06/06	3.99	COPPICING		Winds
MG03	Riachão	20B	0.93	6/12/2002	2002	1	2	06/06/06	3.99	COPPICING		Winds
MG03	Riachão	21	46.22	8/21/2002	2002	2	1	06/04/06	3.63	REPLANTING	17/12/07	Ceratocystis
MG03	Riachão	22	33.93	11/1/2002	2002	1	2	03/02/08	5.26	COPPICING		Winds
MG03	Riachão	24	24.54	11/4/2002	2002	1	2	11/04/10	7.44	COPPICING		Harvesting planning
MG03	Riachão	25	35.96	10/29/2002	2002	1	2	25/02/08	5.33	COPPICING		Winds
MG03	Riachão	26	29.88	10/5/2002	2002	1	2	01/02/09	6.33	COPPICING		Harvesting planning
MG03	Riachão	30	7.61	10/17/2002	2002	1	2	15/04/10	7.50	COPPICING		Harvesting planning
MG03	Riachão	31	35.12	10/9/2002	2002	1	1	15/04/10	7.52	COPPICING		Harvesting planning
MG03	Riachão	32	32.70	10/9/2002	2002	1	1	30/09/10	7.98	COPPICING		Harvesting planning
MG03	Riachão	33	29.60	9/28/2002	2002	1	2	19/01/09	6.32	COPPICING		Harvesting planning
MG03	Riachão	34	7.23	9/18/2002	2002	2	1	15/02/08	5.41	REPLANTING	19/08/08	Fire
MG03	Riachão	35	30.32	9/12/2002	2002	2	1	21/02/08	5.45	REPLANTING	21/07/08	Fire
MG03	Riachão	36	3.55	9/20/2002	2002	1	2	28/11/06	4.19	COPPICING		Winds

MG03	Riachão	50A	26.25	12/1/2002	2002	1	1	06/06/06	3.52	REPLANTING	To be replanted	Replacement-Productivity
MG03	Riachão	52	30.64	11/22/2002	2002	2	1	31/03/10	7.36	REPLANTING	To be replanted	Replacement-Productivity
MG03	Riachão	55	35.22	11/23/2002	2002	1	2	25/03/10	7.34	COPPICING		Harvesting planning
MG03	Riachão	57	23.86	11/13/2002	2002	1	2	08/03/10	7.32	COPPICING		Harvesting planning
MG03	Riachão	60	21.55	11/14/2002	2002	1	1	29/07/10	7.71	REPLANTING	To be replanted	Replacement-Productivity
MG03	Riachão	69	24.03	12/2/2002	2002	1	1	14/08/10	7.70	COPPICING		Harvesting planning
MG03	Riachão	70	31.66	11/28/2002	2002	1	1	13/08/10	7.71	COPPICING		Harvesting planning
MG03	Riachão	78	26.89	11/8/2002	2002	1	2	28/09/06	3.89	COPPICING		Winds
MG03	Riachão	84	12.66	12/20/2002	2002	1	2	14/02/07	4.16	COPPICING		Winds
MG03	Riachão	85	32.87	12/11/2002	2002	1	2	23/10/06	3.87	COPPICING		Winds
MG03	Riachão	98	27.67	12/18/2002	2002	1	2	03/02/07	4.13	COPPICING		Winds
MG03	Riachão	99	25.11	12/18/2002	2002	1	1	26/08/10	7.69	COPPICING		Harvesting planning

B.2. Revision of the monitoring plan

>> N/A

B.3. Request for deviation applied to this monitoring period

>> N/A

B.4. Notification or request of approval of changes

>> N/A

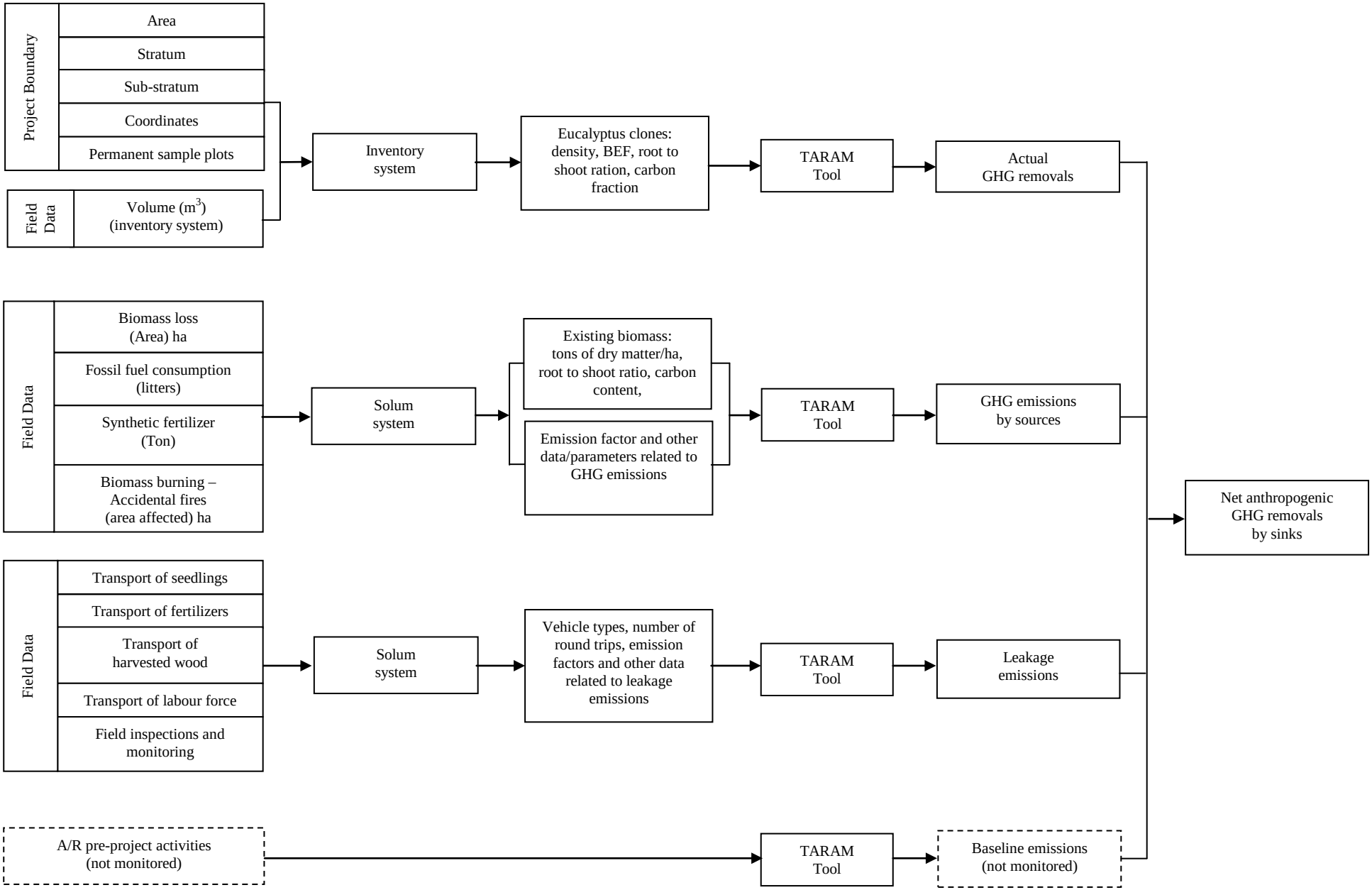
SECTION C. Description of the monitoring system

>> The Monitoring Plan designed for A/R-CDM Project 2569 establishes monitoring procedures to calculate net anthropogenic GHG removals by sinks considering the project boundary, changes in the carbon pools, forest establishment and management for project and leakage emissions.

All data collected in the field are registered and recorded as per Standard Operating Procedures based on ISO 9000 standards. The monitoring of all relevant activities for this project activity strictly followed the Monitoring Plan presented in the PDD 2569 version 3a as per **Figure 1** below.

Figure 1: Diagram of relevant monitoring points

* as contained within the document entitled "Guidelines for completing the monitoring report form (CDM-MR)" (EB 54 meeting report, annex 34).



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Monitoring of the actual GHG removals by sinks

Project boundary/ Field data

The project's area is located in a region of same climate, soil and topography regional conditions. Hence, climate and soil variables were considered to influence carbon stock changes under the same pattern to the whole project activity area. A single stratum was defined for the project areas of the MG03 and MG04 units. This was based on the consideration that the cloned sprouts used in the project activity has a similar growth trend and morphological characteristics, and that the plantations were established under similar soil, relief, climate, and forestry management conditions and adopting a weighted average of clone densities. The stratum was then divided into sub-strata, which were defined based on the planting dates (age class of the plantations). All stands within the project's boundary are geo-referenced and are listed in **Annex 1**. Changes on the geographical delimitations of the stands are monitored and registered in the inventory system (see also **Annex 1**).

The following activities were conducted in order to monitor the actual GHG removals by sinks:

- Field surveys were undertaken to verify that the delineated project boundary spatial extent and location of each stand is congruent with the *ex ante* description presented in Annex 5 of the validated A/R-CDM Project 2569 PDD version 3a. Based on standard operational procedures (IT/INV.01) field surveys were done by the inventory team in order to delineate project boundary and increase measurement accuracy. Any significant changes were recorded and integrated in the Forest Inventory System. Refer to **Annex 1** of this Monitoring Report.

  Inventory data processing is currently conducted by SPP EUCALYPTUS – *Sistema para Prognose de Crescimento e Produção de Eucalyptus sp.* Version 1.0.0 (NEMAF/UFLA). This system was developed by Professor José Roberto Soares Scolforo,[5] from the Forest Engineering Department of the Federal University of Lavras, and may be revised[6] throughout the crediting period based on the quality assurance and quality control system.

- Based on the Forestry Continuous Inventory (FCI) data, each stand annual production was calculated.

- Permanent sample plots are used to determine volume through measuring diameter at breast height (DBH) and tree height.

- Destructive sampling is used at the time of forestry inventory process (SOP IT/INV.01) in order to adjust the inventory system's allometric equation. Trees from outside permanent sample plots are used for this purpose.

- Following the best practices of the forestry management techniques in case sub-strata inventory discrepancy is above 10%, for a 95% confidence level, more plots should be established in order to reduce the sampling error. Then, any discrepancies between the area reported and the area estimated under the A/R-CDM Project 2569 in any part of the strata or sub-strata along with the species planted, including the areas of mortality due to natural factors (e.g. fire and pests) and anthropogenic factors were recorded and reported (refer to **Figure 1**). The project activity forest inventory adopts, by definition, that a sample plot shall be located at an interval of approximately 10 hectares and that each stand shall have at least one sample plot, regardless of the stand size, which are geo-referenced (centre of the plot) increasing conservativeness of measurement. The location of sample plots is randomly defined. All the original maps with the sample plots information are filed for future measurements. Detailed data for each tree in a

[5] Dr. Scolforo's curriculum vitae accessed on November 23rd, 2007 at http://buscatextual.cnpq.br/buscatextual/visualizacv.jsp?id=K4788018A0

[6] Relevant changes in the systems will be recorded and updated to the DOE at time of verifications.

* as contained within the document entitled "Guidelines for completing the monitoring report form (CDM-MR)" (EB 54 meeting report, annex 34).

permanent sample plot (eg. Height, DBH, ID) are registered in the Forestry Inventory System and will be made available to the DOE during verification. The project entity chose not to present this information as an annex to this monitoring report due to the huge amount of information (more than 70,000 rows of an excel spreadsheet).

- The Geographic Information System is readily available for consultation of all issues related to the plantations.

All data collected in the field follow the guidance prescribed by work instruction IT/INV.01. Data are collected via palms and are inputted in the Forestry Continuous Inventory for calculations and recording. Data on volume (m^3) per hectare and area (ha) per sub-stratum are inserted in the TARAM Tool to perform calculations for mass of carbon per hectare for each sub-stratum. The actual GHG removals are then calculated.

Monitoring GHG emissions by sources

Field Data

Emissions from loss of biomass in site preparation and conversion of grassland are calculated in the TARAM Tool according to the planted area.

The following three major sources of GHG emissions are recorded, reported and accounted in the calculation of actual net GHG removals by sinks from the project activity.

- GHG emissions from fossil fuel consumption;
- GHG emissions from nitrogenous fertilizer application;
- The biomass burning in the project area as a result of fire from accidental natural causes or due to anthropogenic activities outside the project activities.

These data were collected in field through specific paper form and inputted in RM SOLUM System, a module of an integrated system designed for budgetary control, and for forest operating control. The Solum system generated a set of reports with detailed data on forestry activities, e.g. activities carried out, stand and farm ID, responsible personnel, fuels and fertilizers consumed, total labor days consumed, and these reports supplied the TARAM Tool with the necessary information to calculate GHG emissions by sources.

The project entity has a Quality Management Department in place which documents and records the significant activities related to forest establishment, including activities related to site preparation and vegetation affected as part of site preparation. The monitoring intervals and specific activities/ staff responsibilities are provided in the Standard Operating Procedures which are based on ISO rationale and are constantly updated based on the continuous improvement approach, including compliance with safety and quality regulations.

The following activities were conducted in order to monitor the GHG emissions:

- Fertilizers application usually occurs in years 1, 2 and 3 of planting and replanting stages.

- Diesel consumption monitoring is either per unit of area (planted area; standard yield hour/hectare; standard yield liters/hour) for site preparation, planting and maintenance, or per unit volume logged (volume logged; standard yield hour/m^3; standard yield liters/hour). Therefore, the quantity of fossil fuels used in the forest management and operations during each year of the project is collected and recorded.

- The occurrence of natural or anthropogenic disturbances such as forest wild fires is closely monitored by the project entity, which maintains continuous vigilance at strategically located fire-watch towers. All stands and natural preservation areas of the forestry services units are surrounded by fire breaks. Location and area data of stratum, stands and permanent sample plots are managed and recorded integrally as per the quality assurance and control systems of the project activity forestry inventory.

Monitoring Leakage

Leakage from the project activity is due to the activities below.

- Transportation of cloned sprouts from the nursery to the plantation sites;
- Transportation of fertilizers from the sale point to the plantation sites;
- Transportation of harvested wood to the processing facilities;
- Transportation of project personnel to the A/R site; and
- Transportation of staff for inspections and monitoring.

The transit of personnel, cloned sprouts, fertilizers and wood occurred according to the specific origin and destination points which the most conservative distances were considered in order to calculate leakage emissions from fossil fuels. Fuel consumption was specifically monitored and calculated as per measurements of the quantity and amounts of goods, personnel transported and the distances travelled throughout the first verification period.

Data were collected in field through specific paper form and inputted in RM SOLUM System, a module of an integrated system designed for budgetary control, and for forest operating control. The Solum system generated a set of reports with detailed data on forestry activities, e.g. activities carried out, stand and farm ID, responsible personnel, fuels and fertilizers consumed total labor days consumed, and supplied the TARAM Tool with the necessary information to calculate leakage emissions.

Monitoring Net anthropogenic GHG removals by sinks

The TARAM Tool provides all formulae to calculate the net anthropogenic GHG removals by sinks, based on field monitored data and other data parameters from other reputable sources.

Although baseline is not monitored under this project activity, according to the A/R-CDM Project 2569 PDD version 3a, in order to strengthen the conservativeness of the project's net anthropogenic GHG removals by sinks, the historical annual A/R rate of the iron sector since the end of the fiscal incentives (8,2%) will be discounted throughout the project lifetime.

Net anthropogenic GHG removals by sinks are calculated taking all these previous elements into account.

The department responsible for each level of the monitoring plan performance is identified in the table below.

Table 3: Responsibility per activity/task performed

Activity/ task	Project Entity	Department
Monitoring the project boundary – Forestry Continuous Inventory (FCI)		
- Area - Stratum - Sub-stratum - Coordinates - Permanent sample plots - Volume (m^3)	Plantar	Planning Management

Monitoring sources of GHG emissions in the field – RM Solum system		
- Biomass loss - Fossil fuel consumption - Synthetic fertilizer applied - Biomass burning	Plantar	Operating Management
Monitoring sources of leakage in the field – RM Solum system		
- Transport of seedlings, fertilizers, harvested wood, labour force - Field inspections and monitoring	Plantar	Operating Management
Data gathering and Project removals calculation		
- Data gathering and calculation of net removals through spreadsheet database	Plantar Carbon	Project Management

All data inserted in the Forestry Continuous Inventory and in the RM Solum System, will be electronically stored for 2 years after the end of the crediting period. The Plantar Quality management system provides a specific SOP (IT/INF.03) developed to manage data storage and data quality assurance which defines a series of rules and back-up instructions in order to guarantee that data are securely maintained.

SECTION D. Data and parameters

D.1. Data and parameters determined at registration and not monitored during the monitoring period, including default values and factors

Data / Parameter:	D_j
Data unit:	Tonnes d.m. m^{-3} merchantable volume
Description:	Basic wood density for species *j*
Source of data used:	Project Record – Inventory System
Value(s) :	0.503
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project removals
Additional comment:	N/A

Data / Parameter:	BEF_{jk}
Data unit:	Dimensionless
Description:	Biomass expansion factor for conversion of merchantable volume to above-ground tree biomass for species *j* sub-stratum *k*
Source of data used:	LADEIRA, 1999
Value(s) :	1.45
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project removals
Additional comment:	N/A

Data / Parameter:	R_j
Data unit:	Dimensionless
Description:	Root-to-shoot ratio appropriate for species *j (eucalyptus)*
Source of data used:	LADEIRA, 1999

Value(s) :	0.38
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project removals
Additional comment:	N/A

Data / Parameter:	CF_j
Data unit:	tonnes C (tonne d.m.)$^{-1}$
Description:	Carbon fraction of dry matter for species *j*
Source of data used:	IPCC
Value(s) :	0.50
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project removals
Additional comment:	N/A

Data / Parameter:	EF_{diesel}
Data unit:	Kg CO_2 l^{-1}
Description:	Emission factor for diesel
Source of data used:	IPCC Default
Value(s) :	2.83
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emissions
Additional comment:	N/A

Data / Parameter:	$EF_{gasoline}$
Data unit:	Kg CO_2 l^{-1}
Description:	Emission factor for gasoline
Source of data used:	IPCC Default
Value(s) :	2.63
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emissions
Additional comment:	N/A

Data / Parameter:	$B_{w,i}$
Data unit:	Tonnes d.m. ha^{-1}
Description:	Peak (maximum) above-ground biomass of pre-existing non-tree vegetation in stratum *i*
Source of data used:	IPCC GPG – LULUCF, Table 3.4.2
Value(s) :	2.30
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emissions
Additional comment:	N/A

Data / Parameter:	R_G
Data unit:	Dimensionless
Description:	Root-shoot ratio appropriate for pre-existing non-tree vegetation
Source of data used:	IPCC GPG – LULUCF, Table 3A.1.8 and table 3.4.3
Value(s) :	1.60
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emissions
Additional comment:	N/A

Data / Parameter:	CF
Data unit:	Tonnes C (tonnes d.m)$^{-1}$
Description:	Carbon fraction of dry biomass in pre-existing non-tree vegetation
Source of data used:	IPCC
Value(s) :	0.50
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emissions
Additional comment:	N/A

Data / Parameter:	GWP_{N_2O}
Data unit:	Kg CO_2 (kg N_2O)$^{-1}$
Description:	Global warming potential for N_2O
Source of data used:	IPCC Default
Value(s) :	310
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emissions
Additional comment:	N/A

Data / Parameter:	EF_{CH4}
Data unit:	Kg CO_2-e. kg C)$^{-1}$
Description:	IPCC default emission ratio for CH_4 of biomass burning
Source of data used:	IPCC Default
Value(s) :	0.012
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emissions
Additional comment:	N/A

Data / Parameter:	GWP_{CH_4}
Data unit:	Kg CO_2 (kg CH_4)$^{-1}$
Description:	Global warming potential for CH_4
Source of data used:	IPCC Default
Value(s) :	21
Indicate what the data are used for (Baseline/ Project/ Leakage emission	Project emissions

calculations)	
Additional comment:	N/A

Data / Parameter:	N/C *ratio*
Data unit:	Dimensionless
Description:	Nitrogen/carbon ratio
Source of data used:	IPCC Default
Value(s) :	0.01
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emissions
Additional comment:	N/A

Data / Parameter:	EF_{N2O}
Data unit:	Kg CO_2-e. kg C)$^{-1}$
Description:	IPCC default emission ratio for N_2O of biomass burning
Source of data used:	IPCC Default
Value(s) :	0.0007
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emissions
Additional comment:	N/A

Data / Parameter:	*CE*
Data unit:	Dimensionless
Description:	Combustion efficiency
Source of data used:	IPCC Default
Value(s) :	0.5
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emissions
Additional comment:	N/A

Data / Parameter:	*CF*
Data unit:	Tonnes C (tonne d.m.)$^{-1}$
Description:	Carbon fraction of dry matter
Source of data used:	IPCC Default
Value(s) :	0.50
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emissions – related to the emission from biomass burning due to accidental fires
Additional comment:	N/A

Data / Parameter:	EF_1
Data unit:	Tonnes N_2O-N (tonnes N input)$^{-1}$
Description:	Emission factor for emissions from N inputs
Source of data used:	IPCC Default

Value(s) :	1.25%
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emissions
Additional comment:	N/A

Data / Parameter:	$FRAC_{GASF}$
Data unit:	Dimensionless
Description:	The fraction that volatilizes as NH_3 and NO_X for synthetic fertilizers
Source of data used:	IPCC Default
Value(s) :	0.1
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emissions
Additional comment:	N/A

Data / Parameter:	EF_{vf}
Data unit:	Kg CO_2 litre-1
Description:	Emission Factor for vehicle type *v* with fuel type *f*
Source of data used:	IPCC Default
Value(s) :	Diesel: 2.83 Gasoline: 2.63
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Leakage emissions
Additional comment:	N/A

D.2. Data and parameters monitored

Data / Parameter:	Plot location
Data unit:	GPS coordinates
Description:	Plot location
Measured /Calculated /Default:	Measured
Source of data:	Project Records
Value(s) of monitored parameter:	See Annex 1
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project boundaries
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	N/A
Measuring/ Reading/ Recording frequency:	Every 5 years
Calculation method (if applicable):	N/A

QA/QC procedures applied:	Quality Assurance System based on ISO 9000 Inventory System

Data / Parameter:	Age of Plantation
Data unit:	Year
Description:	Age of Plantations
Measured /Calculated /Default:	Measured
Source of data:	Project Records
Value(s) of monitored parameter:	See table 7
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project Removals
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	N/A
Measuring/ Reading/ Recording frequency:	Every 5 years
Calculation method (if applicable):	N/A
QA/QC procedures applied:	Quality Assurance System based on ISO 9000 Inventory System

Data / Parameter:	Number of trees
Data unit:	Alphanumeric
Description:	Number of trees
Measured /Calculated /Default:	Measured
Source of data:	Project Records
Value(s) of monitored parameter:	See Annex 1
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project Removals
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	N/A
Measuring/ Reading/ Recording frequency:	Every 5 years
Calculation method (if applicable):	N/A
QA/QC procedures applied:	Quality Assurance System based on ISO 9000 Inventory System

Data / Parameter:	DBH
Data unit:	Meter
Description:	Diameter at Breast Height (DBH)

Measured /Calculated /Default:	Measured
Source of data:	Project Record
Value(s) of monitored parameter:	Values are available in the inventory system. This is not inserted as an annex due to the huge amount of data. (more than 70.000 rows)
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project Removals
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Measuring Tape Note: This equipment does not require any type of calibration control. It is replaced whenever necessary.
Measuring/ Reading/ Recording frequency:	Every 5 years
Calculation method (if applicable):	N/A
QA/QC procedures applied:	Quality Assurance System based on ISO 9000 SOP: IT/SIL.01

Data / Parameter:	H
Data unit:	Meter
Description:	Tree Height
Measured /Calculated /Default:	Measured
Source of data:	Project Records
Value(s) of monitored parameter:	Values are available in the inventory system. This is not inserted as an annex due to the huge amount of data. (more than 70.000 rows)
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project Removals
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Type: Hypsometer Accuracy class: 0,1 meter Serial numbers: 3945, 1308, 1307 and 1306 Calibration frequency: when in usage, every trimester; when not in usage, immediately before using it. Dates of last calibration: 21/01/2010, 15/04/2010, 12/07/2010, 13/10/2010 Validity: 3 months if in use
Measuring/ Reading/ Recording frequency:	Every 5 years
Calculation method (if applicable):	N/A
QA/QC procedures applied:	Quality Assurance System based on ISO 9000 SOP: IT/SIL.01

Data / Parameter:	$V_{ijk,m}$
Data unit:	M^3 $tree^{-1}$ at monitoring year *m*
Description:	Merchantable volume per tree (diameter DBH and height H) in stratum *i* species *j* and sub-stratum *k* (age class)
Measured /Calculated /Default:	Measured and calculated

Source of data:	Project Record – Inventory System
Value(s) of monitored parameter:	Values are available in the inventory system. This is not inserted as an annex due to the huge amount of data. (more than 70.000 rows)
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project removals
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	N/A
Measuring/ Reading/ Recording frequency:	Every 5 years
Calculation method (if applicable):	Monitored values (DBH and tree height) are inserted in the inventory system which calculates the biomass volume (m^3) at the level of tree, sample plot, stratum and sub-stratum.
QA/QC procedures applied:	Quality Assurance System based on ISO 9000 SOP: IT/INV.01

Data / Parameter:	P_{ijk}
Data unit:	Dimensionless
Description:	Plot in stratum *i*, species *j*, sub-stratum *k* (P_{ijk} = total number of plots in stratum *i* species *j sub-stratum k)*
Measured /Calculated /Default:	Measured
Source of data:	Project Record – Inventory System
Value(s) of monitored parameter:	See Annex 2
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project removals
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	N/A
Measuring/ Reading/ Recording frequency:	Every 5 years
Calculation method (if applicable):	N/A
QA/QC procedures applied:	Quality Assurance System based on ISO 9000 SOP: IT/INV.01

Data / Parameter:	$A_{ijk,m}$
Data unit:	Hectare (ha) at monitoring year *m*
Description:	Area of stratum *i* species *j* sub-stratum *k*
Measured /Calculated /Default:	Measured
Source of data:	Project Record – Inventory System

Value(s) of monitored parameter:	326.42+257.99+577.12+319.38+226.54+351.09+226.01+68.07+514.38+1,183.59+166.74+3,835,90+3,157,38+248,63+182,82 = 11,642.06
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project removals
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	N/A
Measuring/ Reading/ Recording frequency:	Every 5 years
Calculation method (if applicable):	N/A
QA/QC procedures applied:	Quality Assurance System based on ISO 9000 SOP: IT/INV.01

Data / Parameter:	$CSP_{diesel,t}$
Data unit:	Litre (l) yr^{-1} in year t
Description:	Volume of diesel consumption
Measured /Calculated /Default:	Measured
Source of data:	Project Record – Solum System
Value(s) of monitored parameter:	

Year	Consumption
2001	343,164
2002	679,585
2003	776,146
2004	725,491
2005	330,527
2006	155,451
2007	127,654
2008	434,457
2009	117,800
2010	192,784
Total	3,883,059

Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emissions
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	N/A
Measuring/ Reading/ Recording frequency:	Annual
Calculation method (if applicable):	N/A
QA/QC procedures applied:	Quality Assurance System based on ISO 9000 SOP: IT/SIL.01

Data / Parameter:	$CSP_{gasoline,t}$
Data unit:	Litre (l) yr^{-1} in year t
Description:	Volume of gasoline consumption
Measured /Calculated /Default:	Measured
Source of data:	Project Record – Solum System
Value(s) of monitored parameter:	<table><tr><th>Year</th><th>Consumption</th></tr><tr><td>2001</td><td>-</td></tr><tr><td>2002</td><td>-</td></tr><tr><td>2003</td><td>-</td></tr><tr><td>2004</td><td>-</td></tr><tr><td>2005</td><td>-</td></tr><tr><td>2006</td><td>11,224</td></tr><tr><td>2007</td><td>11,556</td></tr><tr><td>2008</td><td>-</td></tr><tr><td>2009</td><td>3,956</td></tr><tr><td>2010</td><td>9,099</td></tr><tr><td>Total</td><td>35,835</td></tr></table>
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emissions
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	N/A
Measuring/ Reading/ Recording frequency:	Annual
Calculation method (if applicable):	N/A
QA/QC procedures applied:	Quality Assurance System based on ISO 9000 SOP: IT/SIL.01

Data / Parameter:	A_i
Data unit:	Ha
Description:	Area of stratum
Measured /Calculated /Default:	Measured
Source of data:	Project Record – Inventory System
Value(s) of monitored parameter:	11,642.06
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emissions
Monitoring equipment (type, accuracy class, serial	N/A

number, calibration frequency, date of last calibration, validity)	
Measuring/ Reading/ Recording frequency:	Every 5 years
Calculation method (if applicable):	N/A
QA/QC procedures applied:	Quality Assurance System based on ISO 9000 SOP: IT/INV.01

Data / Parameter:	$A_{burn,ijk,t}$
Data unit:	Ha yr^{-1} in year *t*
Description:	Annual area affected by biomass burning in stratum *i* species *j* sub-stratum *k*
Measured /Calculated /Default:	Measured
Source of data:	Project Record – Inventory System
Value(s) of monitored parameter:	
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emissions
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	N/A
Measuring/ Reading/ Recording frequency:	Annual
Calculation method (if applicable):	N/A
QA/QC procedures applied:	Quality Assurance System based on ISO 9000 SOP: IT/INV.01

Year	Consumption
2001	-
2002	-
2003	-
2004	8
2005	2.3
2006	13.1
2007	343.7
2008	-
2009	0.2
2010	37.5
Total	404.8

Data / Parameter:	$PP_{ijk,t}$
Data unit:	Dimensionless
Description:	Proportion of biomass burned
Measured /Calculated /Default:	Measured
Source of data:	Project Record – Inventory System

Value(s) of monitored parameter:	1.0 (conservatively)
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emissions
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	N/A
Measuring/ Reading/ Recording frequency:	Annual
Calculation method (if applicable):	N/A
QA/QC procedures applied:	N/A

Data / Parameter:	$N_{SF-Fert,t}$
Data unit:	Tonnes N yr^{-1} in year *t*
Description:	Annual amount of synthetic fertilizer nitrogen applied
Measured /Calculated /Default:	Measured
Source of data:	Project Record – Solum System
Value(s) of monitored parameter:	
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emissions
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	N/A
Measuring/ Reading/ Recording frequency:	Annual
Calculation method (if applicable):	N/A
QA/QC procedures applied:	Quality Assurance System based on ISO 9000 SOP: IT/SIL.01

Year	Consumption
2001	10.55
2002	15.86
2003	6.80
2004	14.18
2005	11.25
2006	9.31
2007	1.07
2008	6.27
2009	1.38
2010	0.02
Total	76.69

Data / Parameter:	k_{vf}

Data unit:	Km
Description:	kilometers traveled by each of vehicle type *v* with fuel type *f*
Measured /Calculated /Default:	Measured
Source of data:	Project Record – Solum System
Value(s) of monitored parameter:	Transport of seedlings from the nursery to the project sites: 59,436 Transport of fertilizers from the sale point to the project sites: 133,326 Transport of harvested wood products to the wood processing facilities: 231,715 Transport of labour force to the A/R site: 548,187 Field inspections and monitoring: 48,000
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Leakage emissions
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	N/A
Measuring/ Reading/ Recording frequency:	Annual
Calculation method (if applicable):	N/A
QA/QC procedures applied:	N/A

Data / Parameter:	$B_{ijk,t}$
Data unit:	Tonnes d.m. ha-1
Description:	Average above-ground biomass before burning for stratum i species j sub-stratum k
Measured /Calculated /Default:	Estimated
Source of data:	Project Record – Inventory System
Value(s) of monitored parameter:	27.78; 55.25; 101.44; 107.04; 32.37; 102.15; for each respective year.
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emissions
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	N/A
Measuring/ Reading/ Recording frequency:	Annual
Calculation method (if applicable):	N/A
QA/QC procedures applied:	N/A

SECTION E. Emission reductions calculation

E.1. Baseline emissions calculation

>> >> Before starting straight with the baseline emission calculation it is wise to give an explanation about the monitoring tool system, TARAM version 1.2/PLANTAR. The purpose of the monitoring tool is to provide ex-post data parameters and calculations according to the approved methodology AR-AM0005 version 01 Reforestation as Renewable Source of Wood Supplies for Industrial Use in Brazil and Project Design Document Version 3a of the Project Entity. The monitoring tool system uses a series of worksheets to give the most updated information about the project removals and emissions, leakage emissions and net anthropogenic GHG removals by sinks.

Introduction

The monitoring section of the tool system is divided into thirteen different spreadsheets that ultimately results in the verified net anthropogenic GHG removals by sinks. The system was designed to provide friendly usage to whoever might operate it. It was conceived in a way that it is only necessary to input the figures and all calculation is done automatically. **Table 4** below shows a summary of each individual worksheet and its function.

Table 4: Instructions spreadsheet

Monitoring Instructions

(Monitoring Spreadsheets: Data, 1st ver, 2nd ver, 3rd ver, 4th ver, 5th ver, GHG monitoring, LK monitoring, GHG emissions, LK emissions, Pre-AR, tCERs and Graphs)

Objective

The purpose of the following 13 spreadsheets is to collect and storage data and provide the results of net anthropogenic removals by sinks according to the AR-AM0005 Version 01 - Reforestation as Renewable Source of Wood Supplies for Industrial Use in Brazil and the Plantar Project Design Document - Version 3a February 16th 2009 of The Plantar Group.

Protection

The cells in these monitoring spreadsheets are protected (you can not delete or modify their content), except the cells where you should input data and parameter values.The protection can be eliminated using the name of the sheet as password.

How to use the monitoring spreadsheets

The cells in these monitoring spreadsheets are color-coded, so that you can quickly identify where to input your data and parameter values or find the results of the calculations. There are instructions and data validation rules in some cells in order to assure you are inserting the correct values.

The color of the cells and what it means:

yellow	Yellow cells are the place where to input data and parameter values.
white	White cells have formulae and results. **It is recommended not to delete or modify the content of these cells.**
Green	Green cells are columns and rows titles. **It is recommended not to delete or modify the content of these cells.**
Grey	Grey cells are not used cells.

The worksheets and what they do:

Data	Start your work here. In this worksheet you have to input the data and parameters values for each project verification year throughout the crediting period.
1st - 5th ver	In these worksheets provide the appropriate values according to a forestry inventory system carried out at the verifications years and that complies with the formulae and rules defined in the approved methodology AR-AM005 and in the Project Design Document.
GHG monitoring	In this worksheet you have to input the monitored data needed to calculate greenhouse gas emissions related to the forest establishment, management and harvesting.
LK monitoring	In this worksheet you have to input the monitored data needed to calculate leakage. These calculations are related to emissions outside the project boundaries that are measurable and attributable to the forest establishment, management and harvesting.
GHG emissions	This worksheet provide the calculations results of greenhouse gas emissions according to the data imputed in the worksheet GHG monitoring.
LK emissions	This worksheet provide the calculations results of leakage emissions according to the data imputed in the worksheet LK monitoring.
Pre-AR	This worksheet provide the values of the pre afforestation/reforestation rate calculated at the time of the project validation. These data are not monitored according to the approved methodology.
tCER's	This worksheet provides the monitored *ex-post* net anthropogenic greenhouse gas removals by sinks and the respective volume of tCER's.
Graphs	Here you will find charts illustrating the net anthropogenic GHG removals by sinks each time of project verifications.

Here is all the instruction needed to operate the monitoring sheets of the TARAM version 1.2/PLANTAR system. It is possible to notice that all cells in the worksheets are color-coded, for instance, the yellow cells are the only ones where data and parameters values are inputted into the worksheet. In order to safeguard the integrity of the formulae and descriptions, all the other cells besides the yellow ones are protected by a security code to prevent alterations or misplacement of formulae in the worksheet.

All spreadsheets in the monitoring section ultimately serve to calculate the net anthropogenic GHG removals. Some provide only information, as the “Data” spreadsheet, and some only give results based on formulae and figures derived from other spreadsheets, as the “GHG Emission” sheet. Its results are given based on information provided by the “Data” and “GHG Monitoring” sheets. It is important to consider that there are small differences between formulae results in this report and in the spreadsheets due to rounding.

Baseline

Since the baseline scenario is the maintenance of grassland in its peak and steady state and the sum of the carbon stock changes of the living biomass in the grassland is considered to be zero, this project activity does not require monitoring of the baseline as per the CDM approved methodology AM-AR0005.

Nevertheless, the project entity decided, on a very conservative approach, to maintain the historic rate of reforestation for the production of charcoal for iron production since the end of the fiscal incentives on 1988. Since the end of the fiscal incentives there have been no significant plantation activities, just some very mild investment. In a 12 year period after the end of the fiscal incentives the A/R activities to supply the iron industry just had an average rate of 8.2%, a figure too low to support the iron industry. Even though the reforestation production is not this project activity's baseline it was decided that the project entity would maintain the reforestation production prospects of 8.2% per year as an activity implemented during the pre-project period. **Table 5** summarizes the sum of carbon stock change in pre-existing A/R activities throughout the crediting period.

Table 5: Carbon stock change in pre-existing AR activities

Carbon stock change in pre-existing AR activities

Year $_t$		Sum of carbon stock changes in living biomass of trees under AR activities implemented during the pre-project period		
		Above-ground biomass	Below-ground biomass	Total
Age	Year	t CO2e	t CO2e	t CO2e
1	2001	2,938	1,116	4,054
2	2002	13,024	4,949	17,973
3	2003	33,508	12,733	46,241
4	2004	63,445	24,109	87,554
5	2005	98,282	37,347	135,630
6	2006	139,954	53,183	193,137
7	2007	139,954	53,183	193,137
8	2008	142,598	54,187	196,786
9	2009	151,676	57,637	209,313
10	2010	170,111	64,642	234,753
11	2011	197,054	74,881	271,935
12	2012	228,408	86,795	315,204
13	2013	265,913	101,047	366,960
14	2014	265,913	101,047	366,960
15	2015	268,851	102,163	371,014
16	2016	278,937	105,996	384,933
17	2017	299,421	113,780	413,201
18	2018	329,358	125,156	454,514
19	2019	364,195	138,394	502,590
20	2020	405,867	154,230	560,097
21	2021	405,867	154,230	560,097
22	2022	408,511	155,234	563,746
23	2023	417,589	158,684	576,273
24	2024	436,024	165,689	601,714
25	2025	462,968	175,928	638,895
26	2026	494,321	187,842	682,164
27	2027	531,826	202,094	733,920
28	2028	531,826	202,094	733,920
29	2029	534,764	203,210	737,974
30	2030	544,850	207,043	751,894

As can be noted, at the end of this First Monitoring Period there would have been a total of 234,753 tons of CO_2e in above and below ground if no CDM project activity existed. Therefore, conservatively, the average rate is considered during the baseline calculation as an Accumulated Pre-Project A/R activity. In the subsequent verifications the carbon stock figures will grow, according to **Table 5** above.

E.2. Project emissions calculation

Project Removals

As this Monitoring Report refers to an A/R CDM project activity, this item "Project Removals" is where the amount of carbon stock in living biomass of trees at the Projects units will be verified.

To understand how the monitoring and verification is done, the tables below show all information and steps needed to obtain the amount of tCERs generated in the given crediting period.

Table 6 below is the Data spreadsheet which contains several parameters identified in the methodology which will be used by some formulae in further sheets. The data to be inserted on this spreadsheet is not provided only once in the first verification period, there are five columns to be filled with figures for each verification period, which means that all data required will be assessed again for each subsequent verification period.

Table 6: Data spreadsheet

THE PLANTAR GROUP - REFORESTATION PROJECT

APPLIED METHODOLOGY: AR-AM0005 Version 01 - Reforestation as Renewable Source of Wood Supplies for Industrial Use in Brazil - Project Design Document - Version 3a February 16th 2009

Data and parameters values

Description	Notation	Unit	Data and parameters values					Sources of data
			1st Ver.	2nd Ver.	3rd Ver.	4th Ver.	5th Ver.	
Wood density	D_j	t.d.m. m^3	0.503					Project data
Biomass expansion factor	BEF_{jk}	Dimensionless	1.45					Local data
Carbon fraction	CF_j	t C t.d.m	0.5					IPCC default
Root-shoot ratio	R_j	Dimensionless	0.38					Local data
Ratio of molecular weights of CO2 and C	44/12	Dimensionless	3.67					IPCC default
Project starting date (year)	-	Dimensionless	2000					Project data
Emission factor for diesel	EF_{diesel}	kg CO_2 l	2.83					IPCC default
Emission factor for gasoline	$EF_{gasoline}$	kg CO_2 l	2.63					IPCC default
Peak above ground biomass of pre-existing non-tree vegetatio	$B_{w,i}$	t d. m. ha	2.3					Local data
Root-shoot ratio appropriate for pre-existing non-tree vegetat	R_G	Dimensionless	1.6					Local data
Carbon fraction of dry biomass in pre-existing non-tree vegeta	CF	t C d.m.	0.5					IPCC default
Combustion efficiency	CE	Dimensionless	0.5					IPCC default
Carbon Fraction of dry matter	CF	t d.m.	0.5					IPCC default
Nitrogen/carbon ratio	N/C ratio	Dimensionless	0.01					IPCC default
Emission ratio for N_2O of biomass burning	EF_{N20}	kg $CO_{2\text{-}e}$ (kg C)	0.0007					IPCC default
Emission ratio for CH_4 of biomass burning	EF_{CH4}	kg $CO_{2\text{-}e}$ (kg C)	0.012					IPCC default
Global warming potential for N_2O	$GWPN_2O$	kg CO_2 (kg N_2O)	310					IPCC default
Global warming potential for CH_4	$GWPCH_4$	kg CO_2 (kg CH_4)	21					IPCC default
Ratio of molecular weights of N_2O and nitrogen	44/28	Dimensionless	1.57					
Ratio of molecular weights of CH_4 and carbon	16/12	Dimensionless	1.33					
Emission factor for emissions from N inputs	EF_I	N_2O-N (t N input	1.25%					GPG 2000, default
Fraction that volatilises as NH_3 and NO_X for synthetic fertilizers	$FRAC_{GASF}$	Dimensionless	0.1					IPCC default
Fraction that volatilises as NH_3 and NO_X for organic fertilizers	$FRAC_{GASM}$	Dimensionless	0.2					IPCC default
Global warming potential for N_2O	GWP_{N2O}	kg CO_2 (kg N_2O)	310					IPCC default
Ratio of molecular weights of N_2O and nitrogen	44/28	Dimensionless	1.57					

* as contained within the document entitled "Guidelines for completing the monitoring report form (CDM-MR)" (EB 54 meeting report, annex 34).

Table 7 is a spreadsheet used to monitor and calculate the amount of changes in carbon stock in above and below-ground biomass. In the monitoring section there are 5 similar spreadsheets that will be used in each verification period.

Table 7: 1st verification spreadsheet

* as contained within the document entitled "Guidelines for completing the monitoring report form (CDM-MR)" (EB 54 meeting report, annex 34).

THE PLANTAR GROUP - REFORESTATION PROJECT

APPLIED METHODOLOGY: AR-AM0005 Version 01 - Reforestation as Renewable Source of Wood Supplies for Industrial Use in Brazil - Project Design Document - Version 3a February 16th 2009

Stratum (i): Eucalyptus Plantations - one single site class
Species (j): Advanced Clones

Inventory Date:	**From:**	june/10
	To:	september/10
First Verification year:		2010

Sub-stratum (k)		Area $A_{ijk,m}$	Stand Volume at the End of the First Rotation $V_{ijk,m}$	Actual Stand Volume $V_{ijk,m}$	Mean Carbon Stock in Above-ground Biomass $MC_{AB,ijk,m}$	Mean Carbon Stock in Below-ground Biomass $MC_{BB,ijk,m}$	Changes in Carbon Stock in Above-ground Biomass $C_{AB,ijk,m}$	Changes in Carbon Stock in Below-ground Biomass $C_{BB,ijk,m}$
Age Class	Rotation	ha	m^3 ha	m^3 ha	t C ha	t C ha	t C	t C
TOTALS		**11,642.06**			**801.29**	**434.66**	**1,015,887**	**419,656**
	First	326.42			0.00	0.00	0	0
1	Second	257.99	291.79	0.00	0.00	40.44	0	10,432
	Third				0.00	0.00	0	0
	First	577.12		66.77	24.35	9.25	14,052	5,340
2	Second	319.38	256.47	51.21	18.68	35.54	5,964	11,351
	Third				0.00	0.00	0	0
	First	226.54		0.00	0.00	0.00	0	0
2	Second	351.09	253.20	0.00	0.00	35.09	0	12,319
	Third				0.00	0.00	0	0
	First				0.00	0.00	0	0
3	Second	226.01		153.41	55.94	21.26	12,644	4,805
	Third				0.00	0.00	0	0
	First				0.00	0.00	0	0
3	Second	68.07	189.08	0.00	0.00	26.20	0	1,784
	Third				0.00	0.00	0	0
	First	514.38		228.99	83.51	31.73	42,954	16,323
4	Second				0.00	0.00	0	0
	Third				0.00	0.00	0	0
	First	1,183.59		255.77	93.27	35.44	110,397	41,951
5	Second	166.74		208.12	75.90	28.84	12,655	4,809
	Third				0.00	0.00	0	0
	First	3,835.90		290.63	105.99	40.27	406,550	154,489
6	Second				0.00	0.00	0	0
	Third				0.00	0.00	0	0
	First	3,157.38		314.42	114.66	43.57	362,029	137,571
7	Second				0.00	0.00	0	0
	Third				0.00	0.00	0	0
	First	248.63		282.33	102.96	39.12	25,599	9,727
8	Second				0.00	0.00	0	0
	Third				0.00	0.00	0	0
	First	182.82		345.63	126.04	47.90	23,043	8,756
9	Second				0.00	0.00	0	0
	Third				0.00	0.00	0	0
	First				0.00	0.00	0	0
	Second				0.00	0.00	0	0
	Third				0.00	0.00	0	0
	First				0.00	0.00	0	0
	Second				0.00	0.00	0	0
	Third				0.00	0.00	0	0
	First				0.00	0.00	0	0
	Second				0.00	0.00	0	0
	Third				0.00	0.00	0	0
	First				0.00	0.00	0	0
	Second				0.00	0.00	0	0
	Third				0.00	0.00	0	0
	First				0.00	0.00	0	0
	Second				0.00	0.00	0	0
	Third				0.00	0.00	0	0
	First				0.00	0.00	0	0
	Second				0.00	0.00	0	0
	Third				0.00	0.00	0	0
	First				0.00	0.00	0	0
	Second				0.00	0.00	0	0
	Third				0.00	0.00	0	0
	First				0.00	0.00	0	0
	Second				0.00	0.00	0	0
	Third				0.00	0.00	0	0
	First				0.00	0.00	0	0
	Second				0.00	0.00	0	0
	Third				0.00	0.00	0	0

The first information provided by this sheet is the stratum, that is, the Eucalyptus Plantations – one single site class. The reason for choosing only one single stratum is due to the areas similarities in terms of soil and climate conditions. After the definition of the stratum is settled, there is the definition of plant species which is Advanced Clones. Even though Project 2569 has different clone species they all have similar densities, therefore, an average density was defined in order to preserve the accuracy of the Project calculations. The following figure summarizes the clone densities (for more information, please read the A/R-CDM Project 2569 PDD Reforestation as Renewable Source of Wood Supplies for Industrial Use in Brazil, Version: 03a, Section C.4 Step 2)

Table 8: Densities by clones

CLONE	Db (kg/m³)
3486	470
3336	495
3335	506
3281	510
PL 40	510
3487	520
1591	530
2486	530
3334	550
1288	580

Following the classification of each stand, with their respective basic wood densities, a weighted average of the densities was calculated resulting in a 503.07 Kg/m^3 average basic density.

After the definition of the stratum and species, there are some sub-stratums defined according to the age class found during the field inventory data collecting. Furthermore, each Age Class is also divided to inform its Rotation. The Rotation is used to define the carbon stock in below-ground biomass due to the fact that in the second and third rotations, trees have a quasi fully developed below-ground biomass. Therefore, the calculation of the below-ground biomass is not a function of its actual age. For second and third rotation, the root-shoot ratio is a function of the stand volume at the end of the first rotation in order to calculate the below-ground biomass.

The first data to be actually inputted in the spreadsheet is the inventory date and year of the verification period, the date chosen will affect the date selected in the tCERs spreadsheet. After the date, there are only three columns that need to be fed with information from the inventory system. The first one is the area in hectares for each sub-stratum, the second is the stand volume (m^3) at the end of the first rotation, and the third and final inputted data are the actual stand volume (m^3) which is used to calculate the mean above-ground biomass.

After all information is provided, the spreadsheet uses several formulae to calculate the mean carbon stock above-ground and below-ground biomass and also the change in carbon stock of below and above-ground biomass. The descriptions of the formulae are provided below:

To calculate the Mean Carbon Stock in Above-ground Biomass, the following formulae are used:

$$MC_{AB,ijk,m} = \frac{\sum_{p=1}^{P_{ijk}} PC_{AB,ijk,plot,m}}{P_{ijk}}$$

According to the formulae numbered 18, 20, and 22 in the A/R-CDM PDD 2569, the following formula should be deducted and used to calculate the mean carbon stock in above-ground biomass:

$$MC_{AB,ijk,m} = V_{ijk} \bullet D_j \bullet BEF \bullet CF_j$$

Replacing the formula notations by the figures provided in **Tables 7** and **6** above and considering the volumes of all sub-strata:

$MC_{AB,ijk,m}$ = (66.77 + 51.21 + 153.41 + 228.99 + 255.77 + 208.12 + 290.63 + 314.42 + 282.33 + 345.63) * 0.503 * 1.45 * 0.5

$MC_{AB,ijk,m}$ **= 801.29 tC ha**

To calculate the Mean Carbon Stock in Below-ground Biomass the following formulae are used:

$$MC_{BB,ijk,m} = \frac{\sum_{p=1}^{P_{ijk}} PC_{BB,ijk,plot,m}}{P_{ijk}}$$

According to the formulae numbered 19, 21, and 23 in the A/R-CDM PDD 2569, the following formula should be deducted and used to calculate the mean carbon stock in below-ground biomass:

$$MC_{BB,ijk,m} = V_{ijk} \bullet D_j \bullet BEF \bullet CF_j \bullet R_j$$

Replacing the formula notations by the figures provided in **Tables 7** and **6** above and considering for the first rotation the actual stand volume and for the second and third rotation the stand volume at the end of the first rotation:

$MC_{BB,ijk,m}$ = (291.79 + 66.77 + 256.47 + 253.20 + 153.41 + 189.08 + 228.99 + 255.77 + 208.12 + 290.63 + 314.42 + 282.33 + 345.63) * 0.503 * 1.45 * 0.5 * 0.38

$MC_{BB,ijk,m}$ **= 434.66 tC ha**

To calculate the Changes in Carbon Stock in Above-ground Biomass the following formula is used:

$$C_{AB,ijk,m} = A_{ijk,m} \bullet MC_{AB,ijk,m}$$

Replacing the formula notations by the figures and results provided in **Table 7** above and considering the areas of all sub-strata:

$C_{AB,ijk,m}$ = (577.12 * 24.35) + (319.38 * 18.68) + (226.01 * 55.94) + (514.38 * 83.51) + (1,183.59 * 93.27) + (166.74 * 75.90) + (3,835.90 * 105.99) + (3,157.38 * 114.66) + (248.63 * 102.96) + (182.82 * 126.04)

$C_{AB,ijk,m}$ **= 1,015,887 tC**

To calculate the Changes in Carbon Stock in Below-ground Biomass the following formula is used:

$$C_{BB,ijk,m} = A_{ijk,m} \bullet MC_{BB,ijk,m}$$

Replacing the formula notations by the figures and results provided in **Table 7** above and considering the areas of all sub-strata:

$C_{BB,ijk,m}$ = (257.99 * 40.44) + (577.12 * 9.25) + (319.38 * 35.54) + (351.09 * 35.09) + (226.01 * 21.26) + (68.07 * 26.20) + (514.38 * 31.73) + (1,183.59 * 35.44) + (166.74 * 28.84) + (3,835.90 * 40.27) + (3,157.38 * 43.57) + (248.63 * 39.12) + (182.82 * 47.90)

$C_{BB,ijk,m}$ **= 419,656 tC**

Project Emissions

Project emissions calculate all emissions, ranging from fossil fuels consumption to biomass loss, biomass burning and nitrogen application. After the calculation completion, the results are to be applied further in the spreadsheets to subtract it from the anthropogenic removals by the project sinks. In order to calculate the GHG emission, two spreadsheets are used, "GHG Monitoring" and "GHG Emissions". The "GHG Monitoring" is comprised of a very simple spreadsheet with only monitored data to be inserted into it, with no formulae whatsoever.

The columns of this spreadsheet are composed by eight different parameters which in turn are grouped into four main categories, being Fuel Consumption, Biomass Loss, Biomass Burning, Nitrogen Application. On the other hand the rows represent the project years.

All GHG emission parameters figures are to be stored inside this sheet only. As mentioned, there are four main categories, the first one, "Fuel Consumption", is comprised by Volume of Diesel Consumption and Volume of Gasoline Consumption. These fuels are related to the machinery used in soil preparation, planting, forest maintenance and harvesting. The second category "Biomass Loss" only contemplates the area of stratum that is used to calculate the CO_2 emissions related to the lost of existed biomass prior to the A/R Project. The emissions from loss of biomass in site preparation and conversion of grassland are calculated and it was adopted the conservative assumption that all baseline stratum is conservatively identified as grassland in its peak and steady state, regardless that more than half of the baseline strata was identified as "degraded areas".

The third category is "Biomass Burning" and encompasses three parameters, annual area affected by accidental fire, average aboveground biomass and lastly, proportion of biomass burned. This spreadsheet registered the affected area in hectares, and on a conservative policy, considered that all of the affected area was burned. Finally, based on the age of the biomass burned, an estimation of tonnes of dry matter was made to calculate the related project emission.

The final category in the "GHG Monitoring" spreadsheet is the Nitrogen Application which registers the amount in tonnes of nitrogen fertilizer used in a given year. Even though there is a column for organic fertilizer, the Project has only used synthetic nitrogen fertilizer, since its beginning.

Table 9: GHG monitoring spreadsheet

GHG Emissions By Sources Monitoring Data

Year $_t$		Fuel consumption		Biomass loss	Biomass burning			Nitrogen application	
		Volume of diesel consumption $CSP_{diesel, t}$	Volume of gasoline consumption $CSP_{gasoline, t}$	Area of stratum, i A_i	Annual area affected $A_{burn, ijk, t}$	Average above-ground biomass $B_{ijk, t}$	Proportion of biomass burned $PP_{ijk, t}$	Synthetic fertilizer nitrogen applied	Organic fertilizer nitrogen applied
Age	**Year**	litres	litres	ha	ha	t d. m. ha	dimension lees	t	t
1	2001	343,164		1,479.56				10.55	
2	2002	679,585		3,243.04				15.86	
3	2003	776,146		3,133.95				6.80	
4	2004	725,491		2,819.53	8	27.78	1.00	14.18	
5	2005	330,527		965.98	2.3	55.25	1.00	11.25	
6	2006	155,451	11,224		13.1	101.44	1.00	9.31	
7	2007	127,654	11,556		343.7	107.04	1.00	1.07	
8	2008	434,457						6.27	
9	2009	117,800	3,956		0.2	32.37	1.00	1.38	
10	2010	192,784	9,099		37.5	102.15	1.00	0.02	
11	2011								
12	2012								
13	2013								
14	2014								
15	2015								
16	2016								
17	2017								
18	2018								
19	2019								
20	2020								
21	2021								
22	2022								
23	2023								
24	2024								
25	2025								
26	2026								
27	2027								
28	2028								
29	2029								
30	2030								

The GHG Emissions spreadsheet is the counterpart of the GHG Monitoring spreadsheet; it follows the exact same principle, with the same four categories and with an additional column - "GHG Emissions by source of GHG" -, which is the sum of all the four categories. The only difference is that, while the monitoring spreadsheet represents the monitored data of the GHG parameters, the emission spreadsheet, represents the formulae used to calculate the tonnes of CO_2 per year based on the monitored data. The emissions related to November and December 2000 planting activities were considered in the year 2001.

Table 10: Calculations of the GHG emissions spreadsheet.

GHG Emissions By Sources

Year $_t$		CO2 emissions from burning of fossil fuels $E_{FuelBurn,t}$		Emissions from loss of biomass $E_{BiomassLoss,t}$		Emissions from biomass burning $E_{non\text{-}CO2,\ Biomass\ Burn,\ t}$		Nitrous oxide emissions from nitrogen $N_2O_{\ direct\text{-}N\ fertilizer,\ t}$		GHG emissions by sources $GHG_{\ E,\ t}$	
		t $CO_{2\text{-}e}$ yr^{-1} in year t		t $CO_{2\text{-}e}$ yr^{-1} in year t		t $CO_{2\text{-}e}$ yr^{-1} in year t		t $CO_{2\text{-}e}$ yr^{-1} in year t		t $CO_{2\text{-}e}$ yr^{-1} in year t	
Age	Year	annual	cumulative	annual	cumulative	annual	cumulative	annual	cumulative	annual	cumulative
1	2001	971	971	16,221	16,221	-	-	58	58	17,250	17,250
2	2002	1,923	2,894	35,555	51,775	-	-	87	145	37,565	54,815
3	2003	2,196	5,091	34,359	86,134	-	-	37	182	36,592	91,407
4	2004	2,053	7,144	30,911	117,045	19	19	78	260	33,061	124,468
5	2005	935	8,079	10,590	127,636	11	30	62	321	11,598	136,066
6	2006	469	8,549	-	127,636	113	142	51	372	633	136,699
7	2007	392	8,941	-	127,636	3,122	3,264	6	378	3,519	140,219
8	2008	1,230	10,170	-	127,636	-	3,264	34	413	1,264	141,483
9	2009	344	10,514	-	127,636	1	3,265	8	420	352	141,835
10	2010	570	11,083	-	127,636	325	3,590	0	420	895	142,729
11	2011	-	-	-	-	-	-	-	-	-	-
12	2012	-	-	-	-	-	-	-	-	-	-
13	2013	-	-	-	-	-	-	-	-	-	-
14	2014	-	-	-	-	-	-	-	-	-	-
15	2015	-	-	-	-	-	-	-	-	-	-
16	2016	-	-	-	-	-	-	-	-	-	-
17	2017	-	-	-	-	-	-	-	-	-	-
18	2018	-	-	-	-	-	-	-	-	-	-
19	2019	-	-	-	-	-	-	-	-	-	-
20	2020	-	-	-	-	-	-	-	-	-	-
21	2021	-	-	-	-	-	-	-	-	-	-
22	2022	-	-	-	-	-	-	-	-	-	-
23	2023	-	-	-	-	-	-	-	-	-	-
24	2024	-	-	-	-	-	-	-	-	-	-
25	2025	-	-	-	-	-	-	-	-	-	-
26	2026	-	-	-	-	-	-	-	-	-	-
27	2027	-	-	-	-	-	-	-	-	-	-
28	2028	-	-	-	-	-	-	-	-	-	-
29	2029	-	-	-	-	-	-	-	-	-	-
30	2030	-	-	-	-	-	-	-	-	-	-

To calculate the CO_2 Emissions from Burning of Fossil Fuels the following formula is used:

$$E_{FuelBurn,t} = (CSP_{diesel,t} \bullet EF_{diesel} + CSP_{gasoline,t} \bullet EF_{gasoline}) \bullet 0.001$$

Replacing the formula notations by the monitored figures provided in **Tables 9** and **6** above:

$$E_{FuelBurn,t} = (3{,}883{,}059 * 2.83 + 35{,}835 * 2.63) * 0.001$$

$$E_{FuelBurn,t} = \mathbf{11{,}083\ tCO_2e}$$

To calculate the Emission from Loss of Biomass the following formula is used:

$$E_{BiomassLoss,t} = \sum_{i=1}^{/} A_i \bullet B_{w,i} \bullet (1 + R_G) \bullet CF \bullet \frac{44}{12}$$

Replacing the formula notations by the monitored figures provided in **Tables 9** and **6** above:

$$E_{BiomassLoss,t} = 11{,}642.06 * 2.3 * (1 + 1.6) * 0.5 * \frac{44}{12}$$

$$E_{BiomassLoss,t} = \mathbf{127{,}636\ tCO_2e}$$

The emissions from biomass burning are calculated by using the following formulae:

$$E_{Non-CO_2,BiomassBurn,t} = E_{BiomassBurn,N_2O,t} + E_{BiomassBurn,CH_4,t}$$

$$E_{BiomassBurn,N_2O,t} = E_{BiomassBurn,C,t} \bullet N/C\ ratio \bullet EF_{N2O} \bullet GWP_{N2O} \bullet \frac{44}{28}$$

$$E_{BiomassBurn,CH_4t} = E_{BiomassBurn,C,t} \bullet EF_{CH4} \bullet GWP_{CH4} \bullet \frac{16}{12}$$

$$E_{BiomassBurn,C,t} = \sum_{i=1}^{I} \sum_{j=1}^{J} \sum_{k=1}^{K} A_{burn,ijk,t} \bullet B_{ijk,t} \bullet PP_{ijk,t} \bullet CE \bullet CF$$

Replacing the formula notations by the monitored figures provided in tables 9 and 6 above:

$$E_{BiomassBurn,C,t} = (8.0 * 27.78 + 2.3 * 55.25 + 13.1 * 101.44 + 343.7 * 107.04 + 0.2 * 32.37 + 37.5 * 102.15) * 1 * 0.5 * 0.5$$

$$E_{BiomassBurn,C,t} = 10{,}576\ \text{tC}$$

$$E_{BiomassBurn,CH_4t} = 10{,}576 * 0.012 * 21 * \frac{16}{12}$$

$$E_{BiomassBurn,CH_4t} = \mathbf{3{,}554\ t\ CO_2e}$$

$$E_{BiomassBurn,N_2O,t} = 10{,}576 * 0.01 * 0.0007 * 310 * \frac{44}{28}$$

$$E_{BiomassBurn,N_2O,t} = \mathbf{36\ t\ CO_2e}$$

$$E_{Non\text{-}CO2,BiomassBurn,N2o,t} = 3554 + 36$$

$$\boldsymbol{E_{Non\text{-}CO2,BiomassBurn,N2o,t}} = \mathbf{3{,}590\ tCO_2e}$$

The nitrous oxide emissions from nitrogen fertilization are calculated by using the following formulae:

$$N_2O_{direct-N_{fertilizer},t} = \left[\left(F_{SN,t} + F_{ON,t}\right) \bullet EF_i\right] \bullet \frac{44}{28} \bullet GWP_{N2O}$$

$$F_{SN,t} = N_{SF-Fert,t} \bullet (1 - FRAC_{GASF})$$

$$N_2O_{direct-N_{fertilizer},t} = [(76.69 * (1\text{-}0.1) + (0 * (1 - 0.2) * 1.25\%] * \frac{44}{28} * 310$$

$$N_2O_{direct-N_{fertilizer},t} = \mathbf{420\ tCO_2e}$$

The total GHG emissions by sources are calculated by using the following formula:

$$GHG_{E,t} = E_{FuelBurn,t} + E_{BiomassLoss,t} + E_{Non-CO_2,BiomassBurn,t} + N_2O_{direct-N_{fertilizer},t}$$

Replacing the formula notations by the results from the above formulae:

$GHG_{E,t}$ = 10,485 + 127,649 + 3,590 + 420

$GHG_{E,t}$ **= 142,729 tCO_2e**

E.3. Leakage calculation

>> In this section, the project activity leakage was assumed to occur as a result of the increased emissions measurable and attributable to the project activity from fossil fuel combustion (mobile combustion) outside the project boundary.

Therefore, the form of leakage emissions from the project were due to transportation of seedlings, fertilizers, harvested wood, labor force and staff outside the project boundaries. These leakage emissions were accounted while estimating the net GHG removals by sinks from the project.

To monitor leakage the project entity's operational department provided the information on vehicle types used, distance traveled and fuel consumed in the project related travels outside the project boundary in an annual basis to perform the calculations according to formulae presented in the Monitoring Plan.

The transportation of personnel, cloned sprouts, fertilizers and wood occurred according to the specific origin and destination points which the most conservative distances were considered in order to calculate leakage emissions from fossil fuels. As per the provisions of the CDM approved methodology AR-AM0005, the fuel consumption is specifically monitored and calculated per measurements of the quantity and amounts of goods, personnel transported and the distances travelled throughout the crediting period.

The "Leakage Monitoring" spreadsheet consists of five categories, "Transport of seedlings from the nursery to the project sites", "Transport of fertilizers from the sale point to the project sites", "Transport of harvested wood products to wood processing facilities", "Transport of labour force to the AR site" and lastly "Field inspections and monitoring". The first four categories share the same parameters principles, being the average fuel consumption, the transport distance travelled, the transportation capacity, the type of vehicle (e.g. diesel) and the amount of what was transported, e.g. seedlings, fertilizers, etc.

As stressed before, it is important to bear in mind that all leakage calculation followed the most conservative scenario for all parameters, for instance, for fuel consumption calculation, even if there

were more than one type of vehicle, it was always considered the vehicle with the highest fuel consumption. The same principle served to the distance travelled and capacity of each transportation vehicle.

The last category, “Field Inspections and monitoring”, is related to inspections and field monitoring on the Project site. In a conservative approach the project entity considered two travels per month to calculate leakage emissions due to staff travels to the project areas.

Table 11: Leakage monitoring spreadsheet.

THE PLANTAR GROUP - REFORESTATION PROJECT

APPLIED METHODOLOGY: AR-AM0005 Version 01 - Reforestation as Renewable Source of Wood Supplies for Industrial Use in Brazil - Project Design Document - Version 3a February 16th 2009

Leakage Increase in Emissions From Fossil Fuel Monitoring Data

Year $_t$		Transport of seedlings from the nursery to the project sites					Transport of fertilizers from the sale point to the project sites					Transport of harvested wood products to wood processing facility					Transport of labour force to the AR site					Field inspections and monitoring		
		Seedlings transported	Vehicle type	seedlings per transporting vehicle	Kilometers traveled $k_{vf,t}$	Average fuel consumption e_{vf}	Fertilizers used	Vehicle type	t N per transporting vehicle	Kilometers traveled $k_{vf,t}$	Average fuel consumption e_{vf}	Wood transported	Vehicle type	m^3 per transporting vehicle	Kilometers traveled $k_{vf,t}$	Average fuel consumption e_{vf}	Labour days	Vehicle type	People in one vehicle	Kilometers traveled $k_{vf,t}$	Average fuel consumption e_{vf}	Vehicle type	Kilometers traveled $k_{vf,t}$	Average fuel consumption e_{vf}
Age	**Year**	number	dimensionless	number	Km	litres km	Tons of N	dimensionless	Tons	Km	litres km	m^3	dimensionless	m^3	Km	litres km	Number	dimensionless	Number	Km	litres km	dimensionless	Km	litres km
1	2001	1,985,002	Diesel	80000	270	0.33	175.8	Diesel	25	2603	0.23						18,511	Diesel	41	68.2	0.25	Gasoline	4800	0.10
2	2002	4,397,073	Diesel	80000	270	0.33	263.9	Diesel	25	2603	0.23						39,282	Diesel	41	68.2	0.25	Gasoline	4800	0.10
3	2003	4,574,661	Diesel	80000	270	0.33	113.5	Diesel	25	2603	0.23						65,110	Diesel	41	68.2	0.25	Gasoline	4800	0.10
4	2004	3,907,169	Diesel	80000	270	0.33	237.2	Diesel	25	2603	0.23						65,188	Diesel	41	68.2	0.25	Gasoline	4800	0.10
5	2005	1,400,971	Diesel	80000	270	0.33	188.3	Diesel	25	2603	0.23	29,551	Diesel	38.0	15.64	1.45	40,918	Diesel	41	68.2	0.25	Gasoline	4800	0.10
6	2006	38,825	Diesel	80000	270	0.33	155.5	Diesel	25	2603	0.23	60,447	Diesel	38.0	15.64	1.45	35,598	Diesel	41	68.2	0.25	Gasoline	4800	0.10
7	2007	158,707	Diesel	80000	270	0.33	17.9	Diesel	25	2603	0.23	113,207	Diesel	38.0	15.64	1.45	21,723	Diesel	41	68.2	0.25	Gasoline	4800	0.10
8	2008	889,649	Diesel	80000	270	0.33	104.5	Diesel	25	2603	0.23	248,283	Diesel	38.0	15.64	1.45	20,108	Diesel	41	68.2	0.25	Gasoline	4800	0.10
9	2009	258,676	Diesel	80000	270	0.33	23.6	Diesel	25	2603	0.23	34,819	Diesel	38.0	15.64	1.45	11,781	Diesel	41	68.2	0.25	Gasoline	4800	0.10
10	2010						0.3	Diesel	25	2603	0.23	76,684	Diesel	38.0	15.64	1.45	11,336	Diesel	41	68.2	0.25	Gasoline	4800	0.10
11	2011																							
12	2012																							
13	2013																							
14	2014																							
15	2015																							
16	2016																							
17	2017																							
18	2018																							
19	2019																							
20	2020																							
21	2021																							
22	2022																							
23	2023																							
24	2024																							
25	2025																							
26	2026																							
27	2027																							
28	2028																							
29	2029																							
30	2030																							

* as contained within the document entitled "Guidelines for completing the monitoring report form (CDM-MR)" (EB 54 meeting report, annex 34).

The second part of the emissions calculation applied the data inserted in the “Leakage Monitoring” worksheet to the formulae inside the “Leakage Emission” spreadsheet. Three results are shown for each of the five categories included in the “Leakage Monitoring” spreadsheet; the first one is the number of trips necessary to transport all the given cargo. The second is the fuel consumption of the given vehicle, which leads to the third and final formula, the emission in tonnes of CO_2. A last column, “Increase in GHG Emissions Outside the Project Boundary”, was added to sum all the CO_2 results from Leakage transportation. The leakage emissions related to November and December 2000 planting activities were considered in the year 2001.

Table 12: Leakage emission results spreadsheet.

* as contained within the document entitled "Guidelines for completing the monitoring report form (CDM-MR)” (EB 54 meeting report, annex 34).

THE PLANTAR GROUP - REFORESTATION PROJECT

APPLIED METHODOLOGY: AR-AM0005 Version 01 - Reforestation as Renewable Source of Wood Supplies for Industrial Use in Brazil - Project Design Document - Version 3a February 16th 2009

Increase in emissions from fossil fuel combustion outside the project boundary (Leakage)

Year $_t$		Transport of seedlings from the nursery to the project sites			Transport of fertilizers from the sale point to the project sites			Transport of harvested wood products to wood processing facility			Transport of labour force to the AR site			Field inspections and monitoring			Increase in GHG emissions outside the project boundary LK CO_2 Tons	
		Vehicle type $n_{vf,t}$	Fuel consumption $_{vf,t}$	Emissions LK $_{Vehicle,}$ CO_2	Vehicle type $n_{vf,t}$	Fuel consumption vf,t	Emissions LK $_{Vehicle,}$ CO_2	Vehicle type $n_{vf,t}$	Fuel consumption $_{vf,t}$	Emissions LK $_{Vehicle,}$ CO_2	Vehicle type $n_{vf,t}$	Fuel consumption $_{vf,t}$	Emissions LK $_{Vehicle,}$ CO_2	Vehicle type $n_{vf,t}$	Fuel consumption $_{vf,t}$	Emissions LK $_{Vehicle,}$ CO_2		
Age	**Year**	number	litres	Tons	number	litres	Tons	number	litres	Tons	number	litres	Tons	number	litres	Tons	Annual	Cumulative
1	2001	25	2,211	6	7	4,211	12	-	-	-	451	7,698	22	1	480	1	41	41
2	2002	55	4,897	14	11	6,320	18	-	-	-	958	16,336	46	1	480	1	79	120
3	2003	57	5,095	14	5	2,719	8	-	-	-	1,588	27,076	77	1	480	1	100	220
4	2004	49	4,352	12	9	5,679	16	-	-	-	1,590	27,109	77	1	480	1	106	327
5	2005	18	1,560	4	8	4,508	13	778	17,636	50	998	17,016	48	1	480	1	117	443
6	2006	0	43	0	6	3,724	11	1,591	36,074	102	868	14,804	42	1	480	1	156	599
7	2007	2	177	1	1	429	1	2,979	67,561	191	530	9,034	26	1	480	1	220	819
8	2008	11	991	3	4	2,503	7	6,534	148,173	419	490	8,362	24	1	480	1	454	1,273
9	2009	3	288	1	1	564	2	916	20,779	59	287	4,899	14	1	480	1	76	1,349
10	2010	-	-	-	0	6	0	2,018	45,764	130	276	4,714	13	1	480	1	144	1,494
11	2011	-	-	-	-	-	-	-	-	-	-	-	-			-	-	-
12	2012	-	-	-	-	-	-	-	-	-	-	-	-			-	-	-
13	2013	-	-	-	-	-	-	-	-	-	-	-	-			-	-	-
14	2014	-	-	-	-	-	-	-	-	-	-	-	-			-	-	-
15	2015	-	-	-	-	-	-	-	-	-	-	-	-			-	-	-
16	2016	-	-	-	-	-	-	-	-	-	-	-	-			-	-	-
17	2017	-	-	-	-	-	-	-	-	-	-	-	-			-	-	-
18	2018	-	-	-	-	-	-	-	-	-	-	-	-			-	-	-
19	2019	-	-	-	-	-	-	-	-	-	-	-	-			-	-	-
20	2020	-	-	-	-	-	-	-	-	-	-	-	-			-	-	-
21	2021	-	-	-	-	-	-	-	-	-	-	-	-			-	-	-
22	2022	-	-	-	-	-	-	-	-	-	-	-	-			-	-	-
23	2023	-	-	-	-	-	-	-	-	-	-	-	-			-	-	-
24	2024	-	-	-	-	-	-	-	-	-	-	-	-			-	-	-
25	2025	-	-	-	-	-	-	-	-	-	-	-	-			-	-	-
26	2026	-	-	-	-	-	-	-	-	-	-	-	-			-	-	-
27	2027	-	-	-	-	-	-	-	-	-	-	-	-			-	-	-
28	2028	-	-	-	-	-	-	-	-	-	-	-	-			-	-	-
29	2029	-	-	-	-	-	-	-	-	-	-	-	-			-	-	-
30	2030	-	-	-	-	-	-	-	-	-	-	-	-			-	-	-

* as contained within the document entitled "Guidelines for completing the monitoring report form (CDM-MR)" (EB 54 meeting report, annex 34).

The descriptions of the formulae used in **Table 12** above are as follows:

To calculate the emissions from transport of seedlings from the nursery to the project sites the following formulae are used:

$$LK_{Vehicle,CO_2,t} = \frac{\sum_v \sum_f \left(EF_{ij} \bullet FuelConsumption_{ij,t} \right)}{1000}$$

$$LK_{Vehicle,CO_2,t} = \frac{\sum_v \sum_f \left(EF_{ij} \bullet n_{vf} \bullet K_{vf} \bullet e_{vf} \right)}{1000}$$

Replacing the formula notations by the monitored figures provided in tables 11 and 6 above:

$LK_{Vehicle,CO_2,t}$ = 2.83 * 220 * 270 * 0.33 / 1000

$LK_{Vehicle,CO_2,t}$ **= 56 tCO_2e**

To calculate the emissions from transport of fertilizers from the sale point to the project sites the following formulae are used:

$$LK_{Vehicle,CO_2,t} = \frac{\sum_v \sum_f \left(EF_{ij} \bullet FuelConsumption_{ij,t} \right)}{1000}$$

$$LK_{Vehicle,CO_2,t} = \frac{\sum_v \sum_f \left(EF_{ij} \bullet n_{vf} \bullet K_{vf} \bullet e_{vf} \right)}{1000}$$

Replacing the formula notations by the monitored figures provided in tables 9 and 6 above:

$LK_{Vehicle,CO_2,t}$ = 2.83 * 51 * 2603 * 0,23 / 1000

$LK_{Vehicle,CO_2,t}$ **= 87 tCO_2e**

To calculate the emissions from transport of harvested wood products to wood processing facility the following formulae are used:

$$LK_{Vehicle,CO_2,t} = \frac{\sum_v \sum_f \left(EF_{ij} \bullet FuelConsumption_{ij,t} \right)}{1000}$$

$$LK_{Vehicle,CO_2,t} = \frac{\sum_v \sum_f \left(EF_{ij} \bullet n_{vf} \bullet K_{vf} \bullet e_{vf} \right)}{1000}$$

* as contained within the document entitled "Guidelines for completing the monitoring report form (CDM-MR)" (EB 54 meeting report, annex 34).

Replacing the formula notations by the monitored figures provided in tables 9 and 6 above:

$LK_{Vehicle,CO_2,t}$ = 2.83 * 14,816 * 15.64 * 1.45 / 1000

$LK_{Vehicle,CO_2,t}$ **= 951 tCO_2e**

To calculate the emissions from transport of labour force to the A/R site the following formulae are used:

$$LK_{Vehicle,CO_2,t} = \frac{\sum_v \sum_f \left(EF_{ij} \bullet FuelConsumption_{ij,t}\right)}{1000}$$

$$LK_{Vehicle,CO_2,t} = \frac{\sum_v \sum_f \left(EF_{ij} \bullet n_{vf} \bullet K_{vf} \bullet e_{vf}\right)}{1000}$$

Replacing the formula notations by the monitored figures provided in tables 9 and 6 above:

$LK_{Vehicle,CO_2,t}$ = 2.83 * 8,038 * 68.2 * 0.25 / 1000

$LK_{Vehicle,CO_2,t}$ **= 388 tCO_2e**

To calculate the emissions from field inspections and monitoring the following formulae are used:

$$LK_{Vehicle,CO_2,t} = \frac{\sum_v \sum_f \left(EF_{ij} \bullet FuelConsumption_{ij,t}\right)}{1000}$$

$$LK_{Vehicle,CO_2,t} = \frac{\sum_v \sum_f \left(EF_{ij} \bullet n_{vf} \bullet K_{vf} \bullet e_{vf}\right)}{1000}$$

Replacing the formula notations by the monitored figures provided in tables 9 and 6 above:

$LK_{Vehicle,CO_2,t}$ = 2.63 * 10 * 4800 * 0.1 / 1000

$LK_{Vehicle,CO_2,t}$ **= 13 tCO_2e**

After all formulae are calculated it is possible to verify that the total amount of increase in GHG emissions outside the project boundary (leakage) is of 2,122 tonnes of CO_2.

E.4. Emission reductions calculation / table

>> **Table 13** below shows the spreadsheet with a summary of calculations performed by the previous ones presented in this report, in terms of tons of CO_2. This spreadsheet was designed to demonstrate the actual net GHG removals by sinks that is the result of the carbon stock in living biomass of trees minus

the accumulated GHG emissions related to the forest establishment, and, the net anthropogenic GHG removals by sinks that is the result of the actual net GHG removals by sinks, minus the baseline net GHG removals by sinks, minus the accumulated pre project AR activities, minus the accumulated leakage emissions.

It is worth noting that the same process has to be made for the first verification period and the ones after it. Also the years for the next verification process are automatically calculated based on the year of the first verification period.

Table 13: Anthropogenic GHG removals spreadsheet

THE PLANTAR GROUP - REFORESTATION PROJECT

APPLIED METHODOLOGY: AR-AM0005 Version 01 - Reforestation as Renewable Source of Wood Supplies for Industrial Use in Brazil - Project Design Document - Version 3a February 16th 2009

Verified Net Anthropogenic GHG Removals by Sinks - tCERs

Verification	Year $_t$	Carbon Stock in Living Biomass of Trees $C_{ijk,t}$	Accumulated GHG Emissions $GHG_{E,t}$	Actual Net GHG Removals by Sinks $C_{ACTUAL,t}$	Baseline Net GHG Removals by Sinks C_{BSL}	Accumulated Pre Project AR Activities C_{BSL}	Accumulated Leakage Emissions LK_t	Net Anthropogenic GHG Removals by Sinks $C_{AR\text{-}CDMt}$
		t $CO_{2\text{-}e}$, yr t	t $CO_{2\text{-}e}$, yr t	t $CO_{2\text{-}e}$, yr t	t $CO_{2\text{-}e}$, yr t	t $CO_{2\text{-}e}$, yr t	t $CO_{2\text{-}e}$, yr t	t $CO_{2\text{-}e}$, yr t
First	2010	5,263,659	142,729	5,120,930	-	234,753	1,494	4,884,683
Second	2015	-	-	-	-	-	-	-
Third	2020	-	-	-	-	-	-	-
Fourth	2025	-	-	-	-	-	-	-
Fifth	2030	-	-	-	-	-	-	-
Total		**5,263,659**	**142,729**	**5,120,930**	**-**	**234,753**	**1,494**	**4,884,683**

The descriptions of the formulae used in table 13 above are as follows:

To calculate the Net Anthropogenic GHG Removals by Sinks the following formulae are used:

$$C_{AR-CDM,t} = C_{ACTUAL,t} - C_{BSL,t} - LK_t$$

$$C_{AR-CDM,t} = (C_{ijk,t} - GHG_{E,t}) - C_{BSL,t} - LK_t$$

$$C_{AR-CDM,t} = ((C_{AB,ijk,m} + C_{BB,ijk,m}) * \frac{44}{12}) - GHG_{E,t} - C_{BSL,t} - LK_t$$

Replacing the formula notations by the results achieved in the previous calculations in this report:

$$C_{AR-CDM,t} = ((1{,}015{,}887 + 419{,}656) * \frac{44}{12}) - 142{,}729 - 234{,}753 - 1{,}494$$

$C_{AR-CDM,t}$ **= 4,884,683 tCO_2e**

E.5. Comparison of actual emission reductions with estimates in the CDM-PDD

>>

Item	Values applied in ex-ante calculation of the registered CDM-PDD	Actual values reached during the monitoring period
Emission reductions (tCO_2e)	**2,440,967**	**4,884,683**

E.6. Remarks on difference from estimated value in the PDD

>> There are two main reasons that explain the difference between the net anthropogenic GHG removals by sinks expected in the A/R-CDM PDD 2569 version 3a and the amount achieved in this first monitoring period, which is 4,884,820, according to Section E.5 above.

The first one is related to the mean annual increment (MAI). When preparing the PDD, the project entity, applying a conservative approach, used in the *ex-ante* calculations a MAI of $35m^3$/ha/yr, while in the inventory calculations carried out in 2010, the MAI achieved was around $43m^3$/ha/yr. This event significantly contributed to increase the carbon stock in the living biomass of trees.

Besides MAI increase, the unexpected 2008 worldwide economic crises contributed not only to increase the carbon stock but also to reduce GHG emissions and leakage emissions. To give an example, during the worldwide economic crises, the project entity's pig iron mill stopped its production and therefore, the activities of harvest and charcoal production was also put to a halt. According to *ex-ante* calculations, the area to be harvested in this first verification period was 7.911,36 ha, whereas the effective harvested area was around 2,900 ha, encompassing harvesting due to unexpected events (e.g. accidental fires, winds, plagues, etc.).

Table 14 below shows the main figures affected by the events explained above.

Item	Values applied in *ex-ante* calculation	Actual values reached
Carbon stock in living biomass of trees	2,824,328	5,263,659
GHG emissions by source	145,155	142,729
Actual net GHG removals by sinks	2,679,173	5,120,930
Leakage Emissions	3,453	1,494
Baseline emissions (A/R rate)	234,753	234,753
Net anthropogenic GHG removals by sinks	2,440,967	4,884,683

All other data and/or parameters used in *ex-ante* calculation are the same used to calculate the actual values.

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History of the document

Version	Date	Nature of revision
01	EB 54, Annex 34 28 May 2010	Initial adoption.
Decision Class: Regulatory **Document Type**: Guideline, Form **Business Function**: Issuance		

Annex 1

List of stands within the A/R-CDM Project 2569 boundary, georeference information and maps

Location		Project Boundary Area - Validation 2008			Project Boundary Area - Verification 2010				Reason for changes in stands within the First Monitoring Period	# Trees per ha	Volume Ha	Total Volume	DATA Pre Harvest Inventory	Harvest Year
UNISE	Project	Stand ID	Area ha	Planting year	Stand ID	Area ha	UTM 23K SAD69							
							Longitude	Latitude						
MG03	Buritis	01	41.52	5/12/2000	01	41.52	7934015	492554	xxx	941				
MG03	Buritis	01A	12.93	5/12/2000	01A	12.93	7934223	492268	xxx	959				
MG03	Buritis	02	51.75	28/11/2000	02	51.75	7934231	493013	xxx	2121	277.05	14,338.31	21/11/2007	2008
MG03	Buritis	03	48.90	14/3/2001	03	48.90	7933676	493933	xxx	1045	187.69	9,177.81	15/7/2007	2007
MG03	Buritis	04	46.18	21/3/2001	04	46.18	7933260	494159	xxx	968				
MG03	Buritis	05	27.09	8/1/2001	05	26.25	7932918	493502	Stand redivision	1005	181.72	4,770.07	25/5/2005	2005
					05A	27.03	7933481	493269	Stand redivision	2936	274.43	7,418.34	8/2/2008	2008
MG03	Buritis	06	57.74	10/11/2000	06	57.74	7933097	492928	xxx	1016	122.58	7,077.31	18/8/2004	2005
MG03	Buritis	07	50.74	12/11/2000	07	50.74	7932874	492318	xxx	1027	131.28	6,661.13	18/1/2007	2007
MG03	Buritis	07A	2.32	12/11/2000	07A	2.32	7933226	492090	xxx	1052	178.54	415.01	16/2/2007	2007
MG03	Buritis	08	22.26	16/11/2000	08	22.26	7932023	492159	xxx	855	112.02	2,493.92	18/8/2004	2005
MG03	Buritis	08A	3.92	16/11/2000	08A	3.92	7932272	492111	xxx	855	130.14	510.32	16/2/2007	2007
MG03	Buritis	09	59.36	18/12/2000	09	59.36	7931933	493587	xxx	1052	178.54	10,598.55	18/1/2007	2007
MG03	Buritis	10	60.49	12/1/2001	10	60.49	7931381	493808	xxx	968	197.90	11,971.70	25/5/2005	2005
MG03	Buritis	11	38.00	17/12/2001	11	38.00	7932023	491381	xxx	1057	212.77	8,084.59	11/3/2008	2008
MG03	Buritis	12	48.98	31/1/2002	12	48.98	7932274	490480	xxx	not inventoried	248.30	12,160.83	5/9/2008	2008
MG03	Buritis	13	18.96	27/12/2001	13	18.96	7931611	490484	xxx	999	243.40	4,615.29	19/3/2008	2008
MG03	Buritis	14	30.26	28/2/2002	14	30.26	7931357	490196	xxx	not inventoried	295.58	8,943.28	23/2/2010	2010
MG03	Buritis	15	59.99	6/4/2001	15	59.99	7930835	490205	xxx	998	197.01	11,819.09	19/4/2007	2007
MG03	Buritis	16	63.39	15/4/2001	16	63.39	7930431	489284	xxx	1091	187.30	11,873.46	13/4/2007	2007
MG03	Buritis	17	46.80	5/2/2002	17	46.80	7931126	489454	xxx	917				
MG03	Buritis	18	16.51	13/2/2002	18	16.51	7931675	489012	xxx	not inventoried	312.48	5,158.97	23/2/2010	2010

* as contained within the document entitled "Guidelines for completing the monitoring report form (CDM-MR)" (EB 54 meeting report, annex 34).

MG03	Buritis	19	24.93	15/2/2002	19	24.93	7932138	489017	xxx	945				
MG03	Buritis	20	32.00	20/2/2002	20	32.00	7931756	489556	xxx	not inventoried	240.65	7,701.30	29/10/2008	2008
MG03	Buritis	21	18.57	11/1/2002	21	18.57	7931859	490001	xxx	913				
MG03	Buritis	22	30.65	26/12/2001	22	30.65	7932330	489410	xxx	not inventoried	255.53	7,830.85	25/4/2008	2008
MG03	Buritis	23	36.76	17/1/2002	23	31.03	7932600	489880	Construction of Carbonization Unit	800				
MG03	Buritis	24	20.68	24/12/2001	24	20.68	7932845	490587	xxx	1086	210.95	4,363.45	11/3/2008	2008
MG03	Buritis	25	52.67	21/11/2001	25	52.67	7932499	491437	xxx	not inventoried	223.87	11,792.00	5/12/2007	2008
MG03	Buritis	26	52.11	15/11/2001	26	52.11	7933013	491501	xxx	not inventoried	237.24	12,362.08	19/3/2008	2008
MG03	Buritis	27	37.06	26/2/2002	27	37.06	7932880	488813	xxx	not inventoried	229.40	8,501.28	26/6/2008	2008
MG03	Buritis	28	27.62	3/5/2001	28	27.62	7933136	489940	xxx	953				
MG03	Buritis	29	30.47	5/5/2001	29	30.47	7933282	490464	xxx	not inventoried	171.64	5,230.19	21/11/2007	2008
MG03	Buritis	30	34.65	12/5/2001	30	34.65	7933447	491075	xxx	1002				
MG03	Buritis	30A	19.92	12/5/2001	30A	19.92	7933795	490632	xxx	1035				
MG03	Buritis	31	45.26	10/5/2001	31	45.26	7933687	491745	xxx	1048	266.38	12,057.58	26/9/2007	2007
MG03	Buritis	32	44.77	16/5/2001	32	44.77	7934299	491796	xxx	1006	212.04	9,492.10	26/9/2007	2007
MG03	Buritis	33	33.95	24/5/2001	33	33.95	7934336	491049	xxx	943	241.21	8,189.02	16/8/2007	2007
MG03	Buritis	34	35.09	30/5/2001	34	35.09	7934739	490620	xxx	1089	204.74	7,184.23	16/8/2007	2007
MG03	Buritis	35	27.97	10/7/2001	35	27.97	7935312	490817	xxx	845	248.83	6,960.85	16/8/2007	2007
MG03	Buritis	36	22.41	25/10/2001	36	22.41	7935623	491142	xxx	not inventoried	268.21	6,011.18	17/4/2008	2008
MG03	Buritis	37	52.79	20/7/2001	37	52.79	7935034	491495	xxx	not inventoried	277.64	14,655.98	5/9/2008	2009
MG03	Buritis	38	37.36	22/6/2001	38	37.36	7935197	491966	xxx	1093	287.88	10,755.43	8/2/2008	2008
MG03	Buritis	39	16.10	30/10/2001	39	16.10	7935947	491785	xxx	1122	276.96	4,458.44	17/4/2008	2008
MG03	Buritis	39A	12.68	30/10/2001	39A	12.68	7935774	492321	xxx	1122	275.48	3,492.01	25/4/2008	2008
MG03	Buritis	40	28.87	1/11/2001	40	28.87	7936236	491257	xxx	not inventoried	191.84	5,538.98	15/7/2007	2008
MG03	Buritis	41	39.59	29/12/2001	41	39.59	7936709	490721	xxx	1199	297.63	11,784.46	17/4/2008	2008
MG03	Buritis	42	30.51	8/11/2001	42	30.51	7936096	490769	xxx	not inventoried	280.85	8,569.43	31/7/2008	2008
MG03	Buritis	43	32.27	20/12/2001	43	32.27	7936531	490162	xxx	not inventoried	278.98	9,004.01	26/6/2008	2008
MG03	Buritis	44	29.55	14/11/2001	44	29.55	7935862	490299	xxx	not inventoried	273.64	8,084.73	25/4/2008	2008
MG03	Buritis	45	29.85	1/11/2001	45	29.85	7936368	489643	xxx	not inventoried	243.65	7,274.12	19/3/2008	2008

MG03	Buritis	46	38.91	19/3/2002	46	38.91	7936984	489136	xxx	not inventoried	324.44	12,624.90	5/5/2010	2010
MG03	Buritis	46A	4.83	19/3/2002	46A	4.83	7937174	488833	xxx	not inventoried	322.30	1,555.18	23/2/2010	2010
MG03	Buritis	47	15.90	19/3/2002	47	15.90	7937680	489469	xxx	not inventoried	230.52	3,664.67	26/6/2008	2008
MG03	Buritis	48	40.07	12/3/2002	48	40.07	7937126	489564	xxx	not inventoried	247.84	9,931.21	31/7/2008	2008
MG03	Buritis	49	28.22	25/3/2002	49	28.22	7937106	490200	xxx	not inventoried	335.92	9,478.90	5/5/2010	2010
MG03	Buritis	50	37.97	20/2/2002	50	37.97	7935693	493192	xxx	not inventoried	120.23	4,565.53	26/6/2008	2008
MG03	Buritis	51	19.06	22/2/2002	51	19.02	7936082	493267	xxx	not inventoried	206.91	3,934.73	31/7/2008	2008
MG03	Jacare	01	27.83	20/2/2003	01	27.83	7935150	497235	xxx	1087				
MG03	Jacare	02	21.49	15/4/2003	02	21.49	7935265	496878	xxx	1089				
MG03	Jacare	03	36.59	18/2/2003	03	36.59	7935808	497418	xxx	809				
MG03	Jacare	04	37.19	10/4/2003	04	37.19	7935821	496856	xxx	739				
MG03	Jacare	05	33.91	22/1/2003	05	33.91	7936362	497684	xxx	1054				
MG03	Jacare	06	21.15	19/3/2003	06	21.15	7936329	496907	xxx	792				
MG03	Jacare	07	5.26	8/4/2003	07	5.26	7936696	497538	xxx	717				
MG03	Jacare	08	0.78	14/3/2003	08	0.78	7936709	497313	xxx	792				
MG03	Jacare	09	15.49	7/4/2003	09	15.49	7936652	496881	xxx	771				
MG03	Jacare	10	39.84	4/6/2003	10	39.45	7937156	496849	xxx	1553				
MG03	Jacare	11	28.86	31/12/2002	11	28.86	7937072	496310	xxx	970				
MG03	Jacare	12	34.43	18/7/2003	12	34.43	7937744	496561	xxx	1452				
MG03	Jacare	13	37.29	23/4/2003	13	37.29	7937701	495947	xxx	1092				
MG03	Jacare	14	18.52	30/12/2002	14	18.52	7938241	496459	xxx	1043				
MG03	Jacare	15	23.61	30/12/2002	15	23.61	7938238	495976	xxx	1072				
MG03	Jacare	16	31.95	29/12/2002	16	31.95	7938730	496236	xxx	1042				
MG03	Jacare	17	35.01	29/12/2002	17	35.01	7939178	496278	xxx	1027				
MG03	Jacare	18	16.00	28/12/2002	18	16.00	7939585	496266	xxx	880				
MG03	Jacare	19	33.48	27/12/2002	19	33.48	7939632	496788	xxx	1010				
MG03	Jacare	20	16.30	28/12/2002	20	16.36	7940019	496468	xxx	1013				
					20A	0.60	7940019	496468	Accidental fire	1013	188.26	112.96	16/2/2007	2007
MG03	Jacare	21	13.90	23/12/2002	21	13.90	7939902	497247	xxx	1128				

MG03	Jacare	22	18.70	26/12/2002	22	18.70	7940183	497067	xxx	1019				
MG03	Jacare	23	24.74	27/12/2002	23	24.74	7940436	496657	xxx	852				
MG03	Jacare	24	22.43	28/12/2002	24	22.43	7940688	497030	xxx	1077				
MG03	Jacare	25	11.63	21/12/2002	25	11.63	7940097	497539	xxx	855				
MG03	Jacare	26	15.12	21/12/2002	26	15.12	7940518	497512	xxx	1109				
MG03	Jacare	27	19.99	21/5/2003	27	19.99	7940946	497444	xxx	934				
MG03	Jacare	28	28.14	26/5/2003	28	28.14	7940489	497966	xxx	1025				
MG03	Jacare	29	22.54	23/6/2003	29	22.54	7940978	497872	xxx	1320				
MG03	Jacare	30	18.16	16/5/2003	30	18.16	7941514	497816	xxx	1072				
MG03	Jacare	31	29.06	11/6/2003	31	29.06	7940878	498404	xxx	997				
MG03	Jacare	32	26.47	12/6/2003	32	26.47	7941421	498341	xxx	1026				
MG03	Jacare	33	35.13	17/6/2003	33	35.13	7941929	498256	xxx	1075				
MG03	Jacare	34	23.81	8/7/2003	34	23.82	7941225	498951	xxx	1505				
MG03	Jacare	35	22.31	11/7/2003	35	22.31	7941687	498867	xxx	1464				
MG03	Jacare	36	20.96	24/7/2003	36	20.96	7942174	498784	xxx	1006				
MG03	Jacare	37	24.40	11/2/2003	37	24.40	7936186	498303	xxx	1065				
MG03	Jacare	38	31.17	14/2/2003	38	31.17	7935374	498019	xxx	1097				
MG03	Jacare	39	18.26	20/2/2003	39	18.26	7934670	497837	xxx	1031				
MG03	Jacare	40	23.83	7/3/2003	40	23.83	7935132	498289	xxx	1137				
MG03	Jacare	41	33.83	24/2/2003	41	33.83	7936228	498668	xxx	788				
MG03	Jacare	42	19.32	28/2/2003	42	19.32	7935711	498919	xxx	1129				
MG03	Jacare	43	35.51	28/2/2003	43	35.51	7936391	499128	xxx	791				
MG03	Jacare	44	30.86	7/3/2003	44	30.86	7935901	499650	xxx	1078				
MG03	Jacare	45	31.91	21/3/2003	45	31.91	7936492	499579	xxx	785				
MG03	Jacare	46	11.70	11/3/2003	46	11.70	7935840	500305	xxx	1154				
MG03	Jacare	47	33.20	4/4/2003	47	33.20	7936565	500029	xxx	779				
MG03	Jacare	48	2.35	12/3/2003	48	2.35	7937025	499983	xxx	1082				
MG03	Jacare	49	45.92	9/10/2003	49	45.92	7937274	499668	xxx	1042				
MG03	Jacare	50	1.48	10/10/2003	50	1.48	7936738	498731	xxx	924				

MG03	Jacare	51	23.85	10/10/2003	51	23.85	7937086	498914	xxx	1075	81.08	1,933.83	15/4/2006	2006
MG03	Jacare	52	27.28	13/5/2003	52	27.28	7937131	497794	xxx	1392				
MG03	Jacare	53	20.61	28/3/2003	53	20.61	7937149	497407	xxx	1643				
MG03	Jacare	54	47.28	24/9/2003	54	47.28	7937548	498645	xxx	974				
MG03	Jacare	55	30.68	15/10/2003	55	30.68	7937704	499566	xxx	624				
MG03	Jacare	56	38.76	13/9/2003	56	38.76	7938221	499577	xxx	1010				
MG03	Jacare	57	32.69	18/9/2003	57	32.72	7937956	498586	xxx	1020				
MG03	Jacare	58	11.79	29/8/2003	58	11.79	7938306	498399	xxx	995				
MG03	Jacare	59	7.82	25/7/2003	59	7.82	7938646	498621	xxx	1002				
MG03	Jacare	60	19.09	2/9/2003	60	19.09	7938369	498893	xxx	1031				
MG03	Jacare	61	16.86	3/9/2003	61	16.86	7938404	499219	xxx	1051				
MG03	Jacare	62	26.78	10/9/2003	62	26.78	7938879	499503	xxx	1343				
MG03	Jacare	63	26.61	6/8/2003	63	26.61	7939621	499416	xxx	1036				
MG03	Jacare	64	28.82	11/8/2003	64	28.82	7939681	499173	xxx	1030				
MG03	Jacare	65	29.18	30/7/2003	65	29.18	7940680	499149	xxx	1277				
MG03	Jacare	66	30.41	2/7/2003	66	30.41	7940364	498738	xxx	1551				
MG03	Jacare	67	36.33	16/8/2003	67	36.33	7939636	498798	xxx	1104				
MG03	Jacare	68	34.85	2/7/2003	68	34.85	7940069	498302	xxx	1544				
MG03	Jacare	69	26.36	22/8/2003	69	26.36	7939353	498276	xxx	1033				
MG03	Jacare	70	24.52	29/5/2003	70	24.52	7939765	497975	xxx	786				
MG03	Jacare	71	21.63	30/5/2003	71	21.66	7939532	497677	xxx	786				
MG03	Jacare	72	35.34	30/8/2003	72	35.34	7938883	498034	xxx	1055				
MG03	Jacare	73	40.70	21/5/2003	73	40.70	7939219	497353	xxx	1113				
MG03	Jacare	74	14.84	26/4/2003	74	14.84	7938989	496841	xxx	1116				
MG03	Jacare	75	20.74	28/4/2003	75	14.96	7938373	496861	Construction of Carbonization Unit	1065				
MG03	Jacare	76	17.78	31/10/2003	76	17.88	7938556	497576	xxx	923				
MG03	Jacare	77	26.97	18/10/2003	77	26.97	7938304	497949	xxx	761				
MG03	Jacare	78	38.47	24/10/2003	78	38.47	7937811	497136	xxx	1022				
MG03	Riachao	01	26.57	15/4/2002	01	26.57	7936193	492024	xxx	not inventoried	222.67	5,915.30	5/5/2010	2010

MG03	Riachao	02	31.61	1/4/2002	02	31.61	7936426	492545	xxx	not inventoried	301.70	9,536.39	5/5/2010	2010
MG03	Riachao	03	23.87	8/4/2002	03	23.87	7936686	492131	xxx	1042				
MG03	Riachao	04	28.13	13/4/2002	04	28.13	7936762	491343	xxx	1060				
MG03	Riachao	05	12.33	11/4/2002	05	12.33	7936895	491672	xxx	not inventoried	332.41	4,097.25	23/2/2010	2010
MG03	Riachao	06	43.89	23/4/2002	06	43.89	7937133	492746	xxx	1032	101.22	4,442.70	19/5/2006	2006
MG03	Riachao	07	28.68	25/4/2002	07	26.25	7937277	492011	Stand redivision	1116	334.41	8,779.92	23/2/2010	2010
					07A	6.08	7937216	492338	Stand redivision	1116	177.01	1,075.37	19/5/2006	2007
MG03	Riachao	08	26.36	15/4/2002	08	26.36	7937512	491514	xxx	511	184.84	4,872.05	19/5/2006	2008
MG03	Riachao	09	26.55	17/5/2002	09	26.55	7937585	491050	xxx	512	191.61	5,087.12	19/5/2006	2010
MG03	Riachao	10	42.96	24/5/2002	10	42.96	7938246	490933	xxx	not inventoried	203.76	8,754.33	28/12/2007	2008
MG03	Riachao	11	45.25	30/5/2002	11	18.77	7938096	491451	Stand redivision	1016	155.85	2,925.92	19/5/2006	2006
					11A	26.14	7938596	491313	Stand redivision	1016	155.85	4,074.54	19/5/2006	2006
MG03	Riachao	12	28.83	30/6/2002	12	22.39	7938709	491843	Stand redivision	984				
					12A	6.24	7939112	491705	Accidental fire	984	223.23	1,392.55	5/12/2007	2008
MG03	Riachao	13	28.61	9/8/2002	13	28.61	7938287	492082	xxx	911				
MG03	Riachao	14	45.76	22/5/2002	14	45.76	7937805	492082	xxx	1133	175.71	8,040.66	19/5/2006	2006
MG03	Riachao	15	40.62	15/5/2002	15	40.62	7937711	492892	xxx	995	126.92	5,155.09	19/5/2006	2006
MG03	Riachao	16	66.43	4/9/2002	16	50.89	7938277	492838	Stand redivision	1050				
					16A	14.96	7938705	492432	Accidental fire	1050	245.19	3,668.26	5/12/2007	2008
MG03	Riachao	17	26.45	30/7/2002	17	26.45	7939060	492146	xxx	not inventoried	221.52	5,858.41	28/12/2007	2008
MG03	Riachao	18	34.63	17/6/2002	18	34.63	7939274	492741	xxx	1059	145.45	5,036.40	19/5/2006	2006
MG03	Riachao	19	26.29	26/6/2002	19	25.72	7938948	493056	xxx	not inventoried	150.74	3,876.57	19/5/2006	2006
MG03	Riachao	20	38.41	12/6/2002	20	31.47	7938604	493394	Construction of Carbonization Unit	1399	164.20	5,166.79	19/5/2006	2006
					20A	2.55	7939030	493338	Accidental fire	1399	164.20	418.84	19/5/2006	2006
					20B	0.93	7938139	493432	Accidental fire	1399	164.20	152.12	19/5/2006	2006
MG03	Riachao	21	46.22	21/8/2002	21	46.22	7939545	493470	xxx	1022	129.06	5,965.52	29/5/2006	2006
MG03	Riachao	22	33.93	1/11/2002	22	33.93	7940246	492882	xxx	2025	234.33	7,951.83	28/12/2007	2008
MG03	Riachao	23	36.01	2/11/2002	23	36.01	7940780	492731	xxx	780				
MG03	Riachao	24	24.54	4/11/2002	24	24.54	7940595	492280	xxx	not inventoried	295.26	7,246.60	23/2/2010	2010

MG03	Riachao	25	35.96	29/10/2002	25	35.96	7940002	492133	xxx	1859	235.67	8,475.35	15/1/2008	2008
MG03	Riachao	26	29.88	5/10/2002	26	29.88	7940361	491715	xxx	not inventoried	253.78	7,583.07	29/10/2008	2009
MG03	Riachao	27	43.05	24/10/2002	27	43.05	7939805	491463	xxx	1058				
MG03	Riachao	28	3.42	21/10/2002	28	3.42	7939427	491067	xxx	1010				
MG03	Riachao	29	16.84	19/10/2002	29	16.84	7939766	490913	xxx	1014				
MG03	Riachao	30	7.61	17/10/2002	30	7.61	7940251	490690	xxx	not inventoried	332.77	2,532.82	23/2/2010	2010
MG03	Riachao	31	35.12	9/10/2002	31	35.12	7940245	490179	xxx	743				
MG03	Riachao	32	32.70	9/10/2002	32	32.70	7939743	490362	xxx	973				
MG03	Riachao	33	29.60	28/9/2002	33	29.60	7939259	490396	xxx	not inventoried	293.83	8,698.04	29/10/2008	2009
MG03	Riachao	34	7.23	18/9/2002	34	7.23	7938900	490304	xxx	not inventoried	281.76	2,037.70	28/12/2007	2008
MG03	Riachao	35	30.32	12/9/2002	35	30.32	7938103	490116	xxx	not inventoried	260.51	7,898.77	5/12/2007	2008
MG03	Riachao	36	3.55	20/9/2002	36	3.55	7937557	490499	xxx	44.8	161.25	573.11	29/5/2006	2006
MG03	Riachao	37	1.21	1/9/2002					Construction of Carbonization Unit					
MG03	Riachao	38	5.73	12/9/2002	38	5.73	7938355	489635	xxx	985				
MG03	Riachao	39	36.67	23/9/2002	39	36.67	7939321	489890	xxx	944				
MG03	Riachao	40	23.31	18/9/2002	40	23.31	7939174	489550	xxx	984				
MG03	Riachao	41	13.64	21/9/2002	41	13.64	7939062	489194	xxx	863				
MG03	Riachao	42	15.32	23/9/2002	42	15.32	7939446	489049	xxx	999				
MG03	Riachao	43	14.19	19/9/2002	43	14.19	7939767	489407	xxx	1122				
MG03	Riachao	44	36.55	26/9/2002	44	36.55	7940188	489677	xxx	999				
MG03	Riachao	45	19.46	1/10/2002	45	19.46	7940896	489616	xxx	1090				
MG03	Riachao	46	43.18	8/10/2002	46	43.18	7940948	489160	xxx	1015				
MG03	Riachao	47	23.62	6/11/2002	47	23.62	7941140	488737	xxx	975				
MG03	Riachao	48	21.59	7/11/2002	48	21.59	7941232	488358	xxx	1031				
MG03	Riachao	49	35.18	20/11/2002	49	35.18	7941238	487369	xxx	1065				
MG03	Riachao	49A	32.40	31/12/2002	49A	32.40	7940955	487147	xxx	959				
MG03	Riachao	50	20.22	1/12/2002	50	20.22	7941908	486494	xxx	848				
MG03	Riachao	50A	26.25	1/12/2002	50A	26.25	7941609	486434	xxx	793				
MG03	Riachao	51	21.07	8/11/2002	51	21.07	7940123	487353	xxx	844				

MG03	Riachao	52	30.64	22/11/2002	52	30.64	7940716	486925	xxx	963				
MG03	Riachao	53	23.77	13/11/2002	53	23.77	7941323	486279	xxx	397				
MG03	Riachao	54	8.65	13/11/2002	54	8.65	7940046	486938	xxx	1109				
MG03	Riachao	55	35.22	23/11/2002	55	35.22	7940471	486681	xxx	807				
MG03	Riachao	56	18.21	23/11/2002	56	18.21	7941068	486105	xxx	847				
MG03	Riachao	57	23.86	13/11/2002	57	23.86	7940340	486224	xxx	896				
MG03	Riachao	58	26.07	19/11/2002	58	26.07	7940722	485902	xxx	824				
MG03	Riachao	59	32.39	21/11/2002	59	32.39	7939817	485644	xxx	1030				
MG03	Riachao	60	21.55	14/11/2002	60	21.55	7940113	485501	xxx	1107				
MG03	Riachao	61	0.94	16/12/2002	61	0.94	7942933	498670	xxx	960				
MG03	Riachao	62	28.88	17/12/2002	62	28.88	7942532	498028	xxx	903				
MG03	Riachao	63	24.95	13/12/2002	63	24.95	7942104	497218	xxx	1027				
MG03	Riachao	64	21.05	17/12/2002	64	21.05	7941685	497192	xxx	1036				
MG03	Riachao	65	21.38	12/12/2002	65	21.38	7942110	496669	xxx	1002				
MG03	Riachao	66	30.29	15/12/2002	66	30.29	7941710	496477	xxx	1054				
MG03	Riachao	67	10.44	17/12/2002	67	10.44	7941274	496553	xxx	765				
MG03	Riachao	68	3.15	2/12/2002	68	3.15	7942404	496214	xxx	1112				
MG03	Riachao	69	24.03	2/12/2002	69	24.03	7942170	495717	xxx	1065				
MG03	Riachao	70	31.66	28/11/2002	70	31.66	7941994	495194	xxx	915				
MG03	Riachao	71	9.71	12/12/2002	71	9.71	7941075	495554	xxx	1031				
MG03	Riachao	72	28.63	11/12/2002	72	28.63	7941267	495311	xxx	959				
MG03	Riachao	73	8.70	28/11/2002	73	8.70	7941190	494913	xxx	1126				
MG03	Riachao	74	36.99	12/11/2002	74	36.99	7941738	494043	xxx	958				
MG03	Riachao	75	16.72	11/12/2002	75	16.72	7940749	495075	xxx	1101				
MG03	Riachao	76	19.79	9/12/2002	76	19.79	7940869	494632	xxx	941				
MG03	Riachao	77	21.57	26/11/2002	77	21.57	7941009	494164	xxx	799				
MG03	Riachao	78	26.89	8/11/2002	78	26.89	7941246	493777	xxx	1134	141.50	3,804.59	29/5/2006	2006
MG03	Riachao	79	32.49	11/11/2002	79	32.49	7941540	493390	xxx	945				
MG03	Riachao	80	16.68	27/11/2002	80	16.68	7940359	494881	xxx	990				

MG03	Riachao	81	20.38	26/11/2002	81	20.38	7940418	494480	xxx	922				
MG03	Riachao	82	35.74	26/11/2002	82	35.74	7940509	493990	xxx	989				
MG03	Riachao	84	12.66	20/12/2002	84	12.66	7939894	494725	xxx	996	116.47	1,474.05	29/5/2006	2007
MG03	Riachao	85	32.87	11/12/2002	85	32.87	7939905	494133	xxx	1147	122.05	4,011.70	29/5/2006	2006
MG03	Riachao	88	7.87	11/12/2002	88	7.87	7939631	494422	xxx	918				
MG03	Riachao	89	14.15	14/12/2002	89	14.15	7939211	493848	xxx	1083				
MG03	Riachao	90	24.25	17/12/2002	90	24.25	7938939	495165	xxx	977				
MG03	Riachao	91	12.07	17/12/2002	91	12.07	7938887	494452	xxx	1022				
MG03	Riachao	92	32.17	18/12/2002	92	32.17	7938521	495067	xxx	982				
MG03	Riachao	93	8.25	18/12/2002	93	8.25	7937823	495027	xxx	953				
MG03	Riachao	94	21.35	20/12/2002	94	21.35	7937482	494682	xxx	971				
MG03	Riachao	95	10.88	19/12/2002	95	10.88	7937129	495303	xxx	1088				
MG03	Riachao	96	27.75	23/12/2002	96	27.75	7936850	495639	xxx	1015				
MG03	Riachao	97	37.52	20/12/2002	97	37.52	7936744	494857	xxx	986				
MG03	Riachao	98	34.08	18/12/2002	98	27.67	7937208	493404	Construction of Carbonization Unit	1165	131.37	3,635.01	29/5/2006	2007
MG03	Riachao	99	25.11	18/12/2002	99	25.11	7936397	493101	xxx	1020				
MG03	Riachao	100	12.50	28/10/2003	100	35.60	7940929	493287	xxx	not inventoried	176.18	6,272.19	28/12/2007	2009
MG03	Riachao	100A	23.09	28/10/2003					xxx					
MG04	Buriti Grand	01	18.20	24/4/2004	01	18.20	7929386	465431	xxx	1136				
MG04	Buriti Grand	02	29.87	22/4/2004	02	29.87	7928809	465362	xxx	1067				
MG04	Buriti Grand	03	21.72	27/4/2004	03	21.72	7928954	465770	xxx	1084				
MG04	Buriti Grand	04	19.29	28/4/2004	04	19.29	7928582	466167	xxx	1115				
MG04	Buriti Grand	05	6.64	21/4/2004	05	6.64	7928629	466824	xxx	1079				
MG04	Buriti Grand	06	24.12	24/3/2004	06	24.12	7928406	467334	xxx	1051				
MG04	Buriti Grand	07	22.34	25/3/2004	07	22.34	7928268	466834	xxx	1024				
MG04	Buriti Grand	08	32.29	10/3/2004	08	32.29	7927927	467548	xxx	1102				
MG04	Buriti Grand	09	38.96	21/2/2004	09	38.96	7927636	467229	xxx	1063				
MG04	Buriti Grand	10	25.02	2/3/2004	10	25.02	7928114	466386	xxx	1108				
MG04	Buriti Grand	11	19.94	20/3/2004	11	19.94	7928299	465674	xxx	1167				

MG04	Buriti Grand	12	26.23	25/2/2004	12	26.23	7927964	465871	xxx	1079				
MG04	Buriti Grand	13	31.94	15/2/2004	13	31.94	7927515	466799	xxx	1002				
MG04	Buriti Grand	14	15.18	4/3/2004	14	15.18	7926735	467474	xxx	1057				
MG04	Buriti Grand	15	21.56	8/3/2004	15	21.56	7927030	467352	xxx	1090				
MG04	Buriti Grand	16	20.46	29/4/2004	16	20.46	7926484	467128	xxx	1109				
MG04	Buriti Grand	17	16.69	7/2/2004	17	16.69	7927107	466641	xxx	1064				
MG04	Buriti Grand	18	34.99	5/2/2004	18	34.99	7927429	466133	xxx	1080				
MG04	Buriti Grand	19	34.22	29/1/2004	19	34.22	7927167	465575	xxx	1034				
MG04	Buriti Grand	20	33.63	10/2/2004	20	33.63	7927730	465390	xxx	1028				
MG04	Buriti Grand	21	13.85	23/1/2004	21	13.85	7927491	464807	xxx	1038				
MG04	Buriti Grand	21A	2.56	30/12/2005	21A	2.56	7927518	464936	xxx	1005				
MG04	Buriti Grand	22	8.63	28/1/2004	22	8.63	7927808	464856	xxx	1033				
MG04	Buriti Grand	23	23.70	9/3/2004	23	23.70	7928110	464674	xxx	1087				
MG04	Buriti Grand	24	7.91	13/3/2004	24	7.91	7928575	464352	xxx	1035				
MG04	Buriti Grand	25	3.97	9/3/2004	25	3.97	7928749	464127	xxx	1097				
MG04	Buriti Grand	26	13.06	22/7/2005	26	13.06	7928856	462853	xxx	947				
MG04	Buriti Grand	27	3.89	15/5/2004	27	3.89	7928355	462793	xxx	1070				
MG04	Buriti Grand	28	20.73	15/5/2004	28	20.73	7928306	463182	xxx	1072				
MG04	Buriti Grand	29	30.19	14/5/2004	29	30.19	7928201	463700	xxx	1098				
MG04	Buriti Grand	30	5.47	17/5/2004	30	5.47	7928069	464019	xxx	1187				
MG04	Buriti Grand	31	1.05	17/5/2004	31	1.05	7927901	464138	xxx	1124				
MG04	Buriti Grand	32	12.40	12/5/2004	32	12.40	7927713	463606	xxx	1096				
MG04	Buriti Grand	33	32.43	12/5/2004	33	32.43	7927702	463149	xxx	1006				
MG04	Buriti Grand	34	26.12	7/5/2004	34	26.12	7927800	462762	xxx	1129				
MG04	Buriti Grand	35	20.41	6/5/2004	35	20.41	7927057	462925	xxx	1091				
MG04	Buriti Grand	36	23.11	5/5/2004	36	23.11	7926780	463145	xxx	1134				
MG04	Buriti Grand	37	22.09	3/5/2004	37	22.09	7927162	463492	xxx	1045				
MG04	Buriti Grand	38	13.75	30/4/2004	38	13.75	7927415	463725	xxx	1097				
MG04	Buriti Grand	39	10.60	30/4/2004	39	10.60	7927326	463972	xxx	1102				

MG04	Buriti Grand	40	1.53	3/5/2004	40	1.53	7926987	463910	xxx	1110				
MG04	Buriti Grand	41	3.24	13/7/2004	41	3.24	7926817	463735	xxx	1033				
MG04	Buriti Grand	42	24.02	18/5/2004	42	13.20	7926527	463631	Stand redivision	1152				
					42A	10.57	7926567	463333	Stand redivision	1134				
MG04	Buriti Grand	43	2.79	18/5/2004	43	2.79	7926498	463866	xxx	1070				
MG04	Buriti Grand	44	18.33	13/7/2004	44	18.33	7926695	464089	xxx	999				
MG04	Buriti Grand	45	25.19	19/5/2004	45	25.19	7927017	464305	xxx	1165				
MG04	Buriti Grand	46	26.66	14/7/2004	46	26.66	7926683	464804	xxx	999				
MG04	Buriti Grand	47	22.16	15/7/2004	47	22.16	7926315	464471	xxx	934				
MG04	Buriti Grand	48	25.82	21/7/2004	48	25.82	7926176	464003	xxx	1059				
MG04	Buriti Grand	49	29.35	24/7/2004	49	28.97	7925673	464550	Fire-break opening	959				
MG04	Buriti Grand	50	19.00	24/7/2004	50	19.00	7925890	465002	xxx	996				
MG04	Buriti Grand	51	28.27	22/7/2004	51	28.27	7926302	465301	xxx	996				
MG04	Buriti Grand	52	39.08	3/8/2004	52	39.08	7926505	466116	xxx	1034				
MG04	Buriti Grand	53	20.75	6/8/2004	53	20.75	7926098	466386	xxx	1052				
MG04	Buriti Grand	54	38.93	24/11/2004	54	38.93	7925923	465832	xxx	1018				
MG04	Buriti Grand	55	31.10	22/11/2004	55	31.10	7925497	465456	xxx	1057				
MG04	Buriti Grand	56	27.37	28/7/2004	56	27.37	7925263	464937	xxx	916				
MG04	Buriti Grand	57	25.68	20/11/2004	57	25.68	7924937	465315	xxx	1098				
MG04	Mutuca	01	11.22	22/12/2004	01	11.22	7927678	461105	xxx	896				
MG04	Mutuca	02	11.53	22/12/2004	02	11.53	7927646	461386	xxx	958				
MG04	Mutuca	03	6.36	23/12/2004	03	6.36	7927829	461508	xxx	955				
MG04	Mutuca	04	29.04	23/6/2004	04	29.04	7927237	462228	xxx	1077				
MG04	Mutuca	05	32.10	21/5/2004	05	32.10	7926675	462518	xxx	961				
MG04	Mutuca	06	29.22	24/5/2004	06	29.22	7926135	462888	xxx	1065				
MG04	Mutuca	07	30.84	27/5/2004	07	30.84	7925563	463650	xxx	1124				
MG04	Mutuca	08	16.41	26/5/2004	08	16.41	7925597	463113	xxx	1171				
MG04	Mutuca	09	19.56	27/5/2004	09	19.56	7925201	463530	xxx	1122				
MG04	Mutuca	10	7.06	8/6/2004	10	7.06	7925276	463031	xxx	1083				

MG04	Mutuca	11	40.65	3/6/2004	11	22.52	7924602	462934	Stand redivision	1044				
					11A	18.03	7924935	463253	Stand redivision	1022				
MG04	Mutuca	12	12.89	1/6/2004	12	12.89	7923980	462418	xxx	1087				
MG04	Mutuca	13	14.92	31/5/2004	13	14.92	7924424	462439	xxx	994				
MG04	Mutuca	14	27.31	2/6/2004	14	27.31	7924866	462530	xxx	979				
MG04	Mutuca	15	21.76	9/6/2004	15	21.76	7925396	462717	xxx	1104				
MG04	Mutuca	16	36.30	14/6/2004	16	36.30	7925586	462388	xxx	970				
MG04	Mutuca	17	21.30	17/6/2004	17	21.30	7926175	462267	xxx	1036				
MG04	Mutuca	18	27.01	15/6/2004	18	27.01	7925788	461964	xxx	1048				
MG04	Mutuca	19	37.22	24/6/2004	19	37.22	7926690	461878	xxx	1102				
MG04	Mutuca	20	36.69	25/6/2004	20	36.69	7926307	461485	xxx	1058				
MG04	Mutuca	21	22.29	3/7/2004	21	22.29	7926068	460897	xxx	896				
MG04	Mutuca	22	28.44	7/7/2004	22	28.44	7925794	461222	xxx	852				
MG04	Mutuca	23	36.20	10/7/2004	23	36.20	7925431	461545	xxx	1009				
MG04	Mutuca	24	0.38	22/12/2004	24	0.38	7925315	461010	xxx	1063				
MG04	Mutuca	25	12.15	21/12/2004	25	12.15	7925424	460260	xxx	827				
MG04	Mutuca	26	15.94	14/9/2004	26	15.94	7925201	460599	xxx	759				
MG04	Mutuca	27	25.32	18/9/2004	27	25.32	7925031	461070	xxx	740				
MG04	Mutuca	28	10.41	23/9/2004	28	10.41	7924735	461336	xxx	787				
MG04	Mutuca	29	15.98	12/8/2004	29	15.98	7924832	461643	xxx	1054				
MG04	Mutuca	30	23.17	18/8/2004	30	23.17	7924331	461709	xxx	1053				
MG04	Mutuca	31	19.96	7/10/2004	31	19.96	7924346	461245	xxx	778				
MG04	Mutuca	32	12.53	19/10/2004	32	12.53	7924428	460856	xxx	781				
MG04	Mutuca	33	13.29	21/9/2004	33	13.29	7924660	460677	xxx	737				
MG04	Mutuca	34	22.99	27/11/2004	34	22.99	7924867	460289	xxx	1035				
MG04	Mutuca	35	10.89	21/12/2004	35	10.89	7925135	459982	xxx	778				
MG04	Mutuca	36	12.59	18/12/2004	36	12.59	7924650	459622	xxx	961				
MG04	Mutuca	37	34.88	1/12/2004	37	34.88	7924387	460044	xxx	766				
MG04	Mutuca	38	9.91	20/10/2004	38	9.91	7924214	460503	xxx	714				

MG04	Mutuca	39	18.31	16/10/2004	39	18.31	7923960	460796	xxx	730					
MG04	Mutuca	40	23.22	29/9/2004	40	23.22	7923842	461218	xxx	795					
MG04	Mutuca	41	24.67	23/8/2004	41	24.67	7923765	461729	xxx	1089					
MG04	Mutuca	42	21.50	28/8/2004	42	21.50	7923288	461722	xxx	1031					
MG04	Mutuca	43	21.91	28/9/2004	43	21.91	7923328	461199	xxx	739					
MG04	Mutuca	44	20.62	17/11/2004	44	20.62	7923441	460748	xxx	745					
MG04	Mutuca	45	17.39	16/11/2004	45	17.39	7923817	460367	xxx	795					
MG04	Mutuca	46	20.05	18/11/2004	46	20.05	7923437	460205	xxx	815					
MG04	Mutuca	47	21.41	2/12/2004	47	21.41	7923965	459820	xxx	1024					
MG04	Mutuca	48	13.60	17/12/2004	48	13.60	7924225	459419	xxx	944					
MG04	Mutuca	49	20.96	2/12/2004	49	20.96	7923671	459620	xxx	1043					
MG04	Mutuca	50	19.67	8/12/2004	50	19.67	7923430	459355	xxx	934					
MG04	Mutuca	51	5.31	4/12/2004	51	5.31	7923179	459650	xxx	1100					
MG04	Mutuca	52	25.13	9/12/2004	52	25.13	7923019	459063	xxx	985					
MG04	Mutuca	53	14.52	22/12/2004	53	14.52	7922726	459261	xxx	952					
MG04	Mutuca	54	11.41	10/12/2004	54	11.41	7922561	458696	xxx	1034					
MG04	Mutuca	55	19.27	13/12/2004	55	19.27	7922306	458927	xxx	993					
MG04	Mutuca	56	10.94	11/12/2004	56	10.94	7922177	458312	xxx	1026					
MG04	Mutuca	57	25.81	14/12/2004	57	25.81	7921921	458619	xxx	1047					
MG04	Mutuca	58	18.48	20/4/2005	58	18.48	7926222	458967	xxx	1107					
MG04	Mutuca	59	17.97	16/4/2005	59	17.97	7925892	459304	xxx	1048					
MG04	Mutuca	60	14.83	6/4/2005	60	14.83	7925597	459587	xxx	1073					
MG04	Mutuca	61	22.36	13/4/2005	61	22.36	7925234	459389	xxx	1028					
MG04	Mutuca	62	19.89	27/12/2004	62	19.89	7925530	458992	xxx	981					
MG04	Mutuca	63	32.23	2/4/2005	63	32.23	7925877	458624	xxx	1021					
MG04	Mutuca	64	17.53	11/5/2005	64	17.53	7925283	457324	xxx	1056					
MG04	Mutuca	65	45.80	6/5/2005	65	45.80	7925117	457769	xxx	1089					
MG04	Mutuca	66	30.18	28/4/2005	66	30.18	7925187	458244	xxx	1090					
MG04	Mutuca	67	30.76	21/3/2005	67	30.76	7925036	458622	xxx	1015					

MG04	Mutuca	68	20.01	13/5/2005	68	20.01	7924830	459029	xxx	1100				
MG04	Mutuca	69	43.84	17/6/2005	69	31.53	7923945	457947	Stand redivision	1081				
					69A	11.90	7923396	458011	Stand redivision	1036				
MG04	Mutuca	70	9.65	14/5/2005	70	9.65	7924443	458169	xxx	1062				
MG04	Mutuca	71	29.83	19/5/2005	71	29.83	7924206	458435	xxx	1073				
MG04	Mutuca	72	36.47	15/6/2005	72	36.47	7924022	458814	xxx	1017				
MG04	Mutuca	73	47.20	25/5/2005	73	47.20	7923296	458417	xxx	1072				
MG04	Tamandua	01	11.24	24/6/2003	01	11.25	7935498	471532	xxx	1084				
MG04	Tamandua	02	24.08	3/6/2003	02	22.68	7935097	472310	Stand redivision ("reboleira")	1107				
MG04	Tamandua	03	30.38	6/6/2003	03	29.19	7934765	472487	Stand redivision ("reboleira")	1107				
MG04	Tamandua	04	22.22	31/5/2003	04	20.19	7934377	472345	Stand redivision ("reboleira")	1170				
MG04	Tamandua	05	9.78	28/5/2003	05	9.78	7934202	472477	xxx	1086				
MG04	Tamandua	06	21.02	11/6/2003	06	19.15	7934741	471863	Stand redivision ("reboleira")	1071				
MG04	Tamandua	07	2.66	11/6/2003	07	2.66	7934827	471669	xxx	1070				
MG04	Tamandua	08	25.83	14/5/2003	08	25.83	7934710	471301	xxx	1084				
MG04	Tamandua	09	12.26	27/5/2003	09	12.23	7934455	471524	Stand redivision ("reboleira")	1052				
MG04	Tamandua	10	6.05	26/5/2003	10	6.06	7934201	471540	xxx	1151				
MG04	Tamandua	11	26.83	8/5/2003	11	26.33	7934362	470922	xxx	986				
MG04	Tamandua	12	29.75	8/5/2003	12	29.75	7934479	470485	xxx	1067				
MG04	Tamandua	13	21.45	29/4/2003	13	21.69	7934107	470353	xxx	1083				
MG04	Tamandua	14	21.57	16/5/2003	14	21.57	7933670	470611	xxx	1098				
MG04	Tamandua	15	10.62	14/5/2003	15	10.62	7933937	471005	xxx	1039				
MG04	Tamandua	16	37.29	21/5/2003	16	37.29	7933285	470923	xxx	1078				
MG04	Tamandua	17	20.64	22/5/2003	17	19.84	7933229	471549	xxx	1087				
MG04	Tamandua	18	33.31	23/5/2003	18	33.31	7932792	471432	xxx	1066				
MG04	Tamandua	19	24.21	18/6/2003	19	24.21	7932441	470640	xxx	1052				

MG04	Tamandua	20	25.68	20/6/2003	20	25.68	7932091	470528	xxx	1036				
MG04	Tamandua	21	35.09	2/7/2003	21	35.09	7931297	469914	xxx	1124				
MG04	Tamandua	22	25.05	7/7/2003	22	24.94	7931186	470206	xxx	1094				
MG04	Tamandua	23	6.92	7/7/2003	23	6.92	7930681	469815	xxx	1129				
MG04	Tamandua	24	14.70	9/7/2003	24	14.70	7930491	470085	xxx	1089				
MG04	Tamandua	25	20.76	10/7/2003	25	19.38	7930254	469710	Stand redivision ("reboleira")	1053				
MG04	Tamandua	26	26.64	15/7/2003	26	25.12	7930291	470434	Stand redivision ("reboleira")	1086				
MG04	Tamandua	27	27.23	21/7/2003	27	24.84	7930331	471239	Stand redivision ("reboleira")	1088				
MG04	Tamandua	28	40.84	25/11/2003	28	37.38	7931968	465982	Stand redivision ("reboleira")	1017				
MG04	Tamandua	29	25.02	24/11/2003	29	24.41	7931399	465761	Stand redivision ("reboleira")	991				
MG04	Tamandua	30	39.31	27/11/2003	30	36.62	7932129	466645	Stand redivision ("reboleira")	1031				
MG04	Tamandua	31	34.09	15/12/2003	31	31.60	7931672	466543	Stand redivision ("reboleira")	1066				
MG04	Tamandua	32	27.75	21/11/2003	32	21.38	7931212	466725	Stand redivision ("reboleira")	1008				
MG04	Tamandua	33	16.12	20/11/2003	33	7.01	7931687	467439	Stand redivision	1083				
					33A	8.10	7931447	467655	Stand redivision ("reboleira")	1059				
					33B	0.23	7931449	467912	Stand redivision	1083				
MG04	Tamandua	34	17.90	19/11/2003	34	16.96	7931179	467766	Stand redivision ("reboleira")	1059				
MG04	Tamandua	35	16.24	22/7/2003	35	15.11	7930425	468291	Stand redivision ("reboleira")	1073				
MG04	Tamandua	36	21.36	7/1/2004	36	19.92	7930197	468621	Stand redivision ("reboleira")	1107				
MG04	Tamandua	37	19.07	13/11/2003	37	18.74	7930243	468985	Stand redivision ("reboleira")	991				
MG04	Tamandua	38	1.97	13/11/2003	38	1.97	7929933	469277	xxx	1031				
MG04	Tamandua	39	7.59	1/9/2004	39	7.60	7929762	469495	xxx	965				

MG04	Tamandua	40	13.95	10/11/2003	40	13.47	7929478	469549	Stand redivision ("reboleira")	1092				
MG04	Tamandua	41	4.80	11/11/2003	41	4.80	7929579	469243	xxx	1105				
MG04	Tamandua	42	18.62	11/11/2003	42	17.68	7929788	468968	Stand redivision ("reboleira")	1053				
MG04	Tamandua	43	1.33	2/9/2004	43	1.33	7929504	468949	xxx	929				
MG04	Tamandua	44	18.09	2/9/2004	44	9.06	7929222	468980	Stand redivision	1057				
					44A	6.94	7929503	468603	Stand redivision ("reboleira")	882				
					44B	1.07	7929303	468550	Stand redivision	1057				
MG04	Tamandua	45	18.03	18/11/2003	45	16.71	7929767	468450	Stand redivision ("reboleira")	1009				
MG04	Tamandua	46	20.91	8/8/2003	46	19.32	7929593	468076	Stand redivision ("reboleira")	1116				
MG04	Tamandua	47	14.92	31/10/2003	47	13.07	7929269	468301	Stand redivision ("reboleira")	1077				
MG04	Tamandua	48	0.62	18/11/2003	48	0.62	7929171	468542	xxx	1093				
MG04	Tamandua	49	15.96	5/11/2003	49	15.43	7929062	468778	Stand redivision ("reboleira")	1071				
MG04	Tamandua	50	8.89	5/11/2003	50	8.89	7928848	469148	xxx	1049				
MG04	Tamandua	51	20.25	7/11/2003	51	20.25	7928860	469514	xxx	1059				
MG04	Tamandua	52	6.06	9/9/2004	52	5.74	7928519	469358	Stand redivision ("reboleira")	1055				
MG04	Tamandua	53	8.07	28/10/2003	53	7.72	7928589	469070	Stand redivision ("reboleira")	1111				
MG04	Tamandua	54	14.15	29/10/2003	54	13.58	7928727	468705	Stand redivision ("reboleira")	1065				
MG04	Tamandua	55	27.42	30/10/2003	55	25.32	7928789	468179	Stand redivision ("reboleira")	1097				
MG04	Tamandua	56	13.96	12/8/2003	56	12.28	7928804	467861	Stand redivision ("reboleira")	1110				
MG04	Tamandua	57	13.55	24/9/2003	57	12.96	7927920	469629	Stand redivision ("reboleira")	1145				
MG04	Tamandua	58	32.98	24/9/2003	58	26.41	7928280	470028	Stand redivision	1106				
					58A	6.06	7928240	470350	Stand redivision	1105				

MG04	Tamandua	59	23.49	26/9/2003	59	22.92	7927866	470246	Stand redivision ("reboleira")	1124				
MG04	Tamandua	60	31.80	2/10/2003	60	11.34	7927668	469761	Stand redivision	1078				
					60A	9.77	7927375	469488	Stand redivision	1134				
					60B	9.25	7927075	469611	Stand redivision ("reboleira")	993				
MG04	Tamandua	61	26.30	17/10/2003	61	24.57	7927279	469977	Stand redivision ("reboleira")	990				
MG04	Tamandua	62	21.38	21/10/2003	62	14.38	7927570	470613	Stand redivision	1027				
					62A	6.57	7927369	470391	Stand redivision	1056				
MG04	Tamandua	63	31.83	24/10/2003	63	31.19	7927138	470896	Stand redivision ("reboleira")	1020				
MG04	Tamandua	64	11.13	25/10/2003	64	9.95	7926567	470799	Stand redivision ("reboleira")	1104				
MG04	Tamandua	65	30.80	27/10/2003	65	24.34	7926855	470498	Stand redivision	1054				
					65A	6.08	7926367	470431	Stand redivision	1045				
MG04	Tamandua	66	21.66	15/10/2003	66	19.59	7926844	470105	Stand redivision ("reboleira")	1125				
MG04	Tamandua	67	22.82	13/10/2003	67	22.82	7926369	470022	xxx	1025				
MG04	Tamandua	68	24.12	8/10/2003	68	12.61	7926422	469610	Stand redivision	1046				
					68A	11.14	7926748	469595	Stand redivision	1092				
MG04	Tamandua	69	19.21	22/6/2005	69	19.22	7925624	467782	xxx	1041				
MG04	Tamandua	69A	3.47	30/12/2005					Establishment of legal reserve area					
MG04	Tamandua	70	28.66	13/9/2003	70	27.07	7925980	468450	Stand redivision ("reboleira")	1043				
MG04	Tamandua	71	14.85	9/9/2003	71	14.14	7925918	469061	Stand redivision ("reboleira")	1093				
MG04	Tamandua	72	26.79	28/8/2003	72	25.49	7925829	469593	Stand redivision ("reboleira")	1043				
MG04	Tamandua	73	17.84	22/8/2003	73	16.57	7925697	470310	Stand redivision ("reboleira")	1092				
MG04	Tamandua	74	5.93	20/8/2003	74	5.87	7925629	470732	xxx	976				
MG04	Tamandua	75	6.20	19/8/2003	75	6.29	7925361	470640	xxx	1064				

MG04	Tamandua	76	29.86	2/9/2003	76	28.73	7925287	470223	Stand redivision ("reboleira")	1023				
MG04	Tamandua	77	36.73	8/9/2003	77	35.83	7925349	469563	Stand redivision ("reboleira")	1064				
MG04	Tamandua	78	17.13	17/9/2003	78	16.47	7925495	469020	Stand redivision ("reboleira")	1017				
MG04	Tamandua	79	9.13	15/9/2003	79	9.13	7925619	468644	Stand redivision ("reboleira")	1046				
MG04	Tamandua	80	9.26	18/9/2003	80	9.26	7925222	468838	xxx	1146				
MG04	Tamandua	81	9.81	28/12/2004	81	9.81	7924769	468557	xxx	1044				
MG04	Tamandua	82	2.15	28/12/2004	82	2.14	7924692	468709	xxx	936				
MG04	Tamandua	83	1.63	28/12/2004	83	1.63	7924847	468918	xxx	914				
MG04	Tamandua	84	26.27	20/4/2004	84	15.75	7924989	469304	Stand redivision	993				
					84A	10.22	7924724	469154	Stand redivision	904				
MG04	Tamandua	85	28.90	31/3/2004	85	28.86	7924848	469983	xxx	1020				
MG04	Tamandua	86	25.18	2/4/2004	86	25.19	7924676	470689	xxx	1035				
MG04	Tamandua	87	22.51	20/4/2004	87	22.51	7924454	469926	xxx	989				
MG04	Tamandua	88	24.29	16/4/2004	88	24.31	7924293	470441	xxx	985				
MG04	Tamandua	89	24.95	8/4/2004	89	24.99	7924090	470923	xxx	1062				
MG04	Tamandua	90	39.71	25/10/2004	90	39.71	7924007	469214	xxx	724				
MG04	Tamandua	91	24.25	11/11/2004	91	24.26	7923845	468650	xxx	791				
MG04	Tamandua	92	32.78	26/10/2004	92	32.78	7923324	468778	xxx	672				
MG04	Tamandua	93	33.59	30/10/2004	93	33.60	7923046	469087	xxx	702				
MG04	Tamandua	94	22.33	8/11/2004	94	22.34	7923520	469530	xxx	707				
MG04	Tamandua	95	27.61	4/11/2004	95	27.61	7923232	469905	xxx	763				
MG04	Tamandua	96	28.50	30/10/2004	96	28.50	7922810	469536	xxx	729				
MG04	Tamandua	97	25.34	9/11/2004	97	25.34	7922433	469850	xxx	721				
MG04	Tamandua	98	13.88	10/11/2004	98	13.89	7922912	470127	xxx	786				
MG04	Vitoria	01	19.59	9/7/2005	01	19.27	7924010	464919	xxx	1067				
MG04	Vitoria	02	23.31	1/7/2005	02	23.18	7923860	464534	xxx	1070				
MG04	Vitoria	03	21.56	13/7/2005	03	20.70	7923380	464700	xxx	1070				

MG04	Vitoria	04	30.13	22/7/2005	04	30.08	7923697	464116	xxx	1089				
MG04	Vitoria	05	33.62	30/7/2005	05	33.62	7923592	463597	xxx	1048				
MG04	Vitoria	06	30.53	2/8/2005	06	30.42	7923029	463690	xxx	1056				
MG04	Vitoria	07	27.38	29/8/2005	07	27.26	7923154	464249	xxx	1075				
MG04	Vitoria	08	38.54	12/9/2005	08	37.86	7922630	464053	xxx	1066				
MG04	Vitoria	09	34.07	28/9/2005	09	32.20	7922193	463780	Stand redivision ("reboleira")	1056				
MG04	Vitoria	11	17.44	29/12/2005	11	17.44	7922194	462950	xxx	990				
MG04	Vitoria	12	27.32	22/12/2005	12	27.23	7922856	462960	xxx	1043				
MG04	Vitoria	12A	29.37	31/12/2005	12A	29.10	7922617	462621	xxx	1037				
MG04	Vitoria	13	24.38	2/12/2005	13	23.27	7923274	463182	xxx	998				
MG04	Vitoria	14	11.35	27/12/2005	14	11.75	7922953	462300	xxx	1058				
MG04	Vitoria	15	11.57	24/12/2005	15	11.39	7923281	462532	xxx	1013				
MG04	Vitoria	16	15.11	14/12/2005	16	16.61	7923664	462912	xxx	989				
MG04	Vitoria	17	24.04	16/11/2005	17	19.73	7924030	463414	xxx	1032				
MG04	Vitoria	18	34.28	9/11/2005	18	37.21	7924337	463867	xxx	994				
MG04	Vitoria	19	32.37	30/12/2005	19	32.90	7924644	464492	xxx	1088				
MG04	Vitoria	20	18.34	30/12/2005	20	18.06	7924810	464186	xxx	1035				
MG04	Vitoria	21	6.76	28/11/2005	21	5.35	7923984	462644	xxx	1047				
MG04	Vitoria	22	10.44	24/11/2005	22	9.75	7924251	462912	xxx	1054				
Total		***487***	***11711.37***		***506***	***11642.06***				***482939.8***	***18729.96***	***553670.58***		