Report on Progress and definitions inherent to the expansion of the Sustainable Forest Management area.

1. Brief history of the Sustainable Forest Management Project

The sustainable use of part of the more than 679,000 hectares owned by BR ARBO provides for staggered activities of forest interventions under a Forest Management regime, recognized as sustainable, with the potential to act as a filter in the process of carbon cycling and in its packaging for decades, in the form of wood.

The concept and assumptions applicable to forest management

Forest management on a sustainable basis is applied through the cutting and selective management of native timber species of commercial interest.

Where the area that will be managed is subdivided into 30 forest production units (UPF) and each year one of the 30 units will be harvested, completing a minimum cycle of 30 years. The harvest provides for the limited withdrawal of about 20 m3 of timber in logs per hectare, out of a total allowed by law of up to 25 m3/hectare for a period of 30 years.

After careful planning and choice of the trees to be cut, with the adoption of low-impact exploitation practices and strict control of the production process, the removal of 4 to 6 trees with more than 50 centimeters in diameter per hectare is prescribed. In this way, maintaining the horizontal and vertical structure of the forest layer.

After forest exploitation, the forest harvesting unit (UPF) will be monitored in its growth through the implementation of permanent plots of forest inventory for a period of 30 years, in addition to promoting its conservation, where at the end of the rotation cycle it will be fully recomposed in its stock of commercial wood and carbon.

In this period of 30 years, the only activities planned are the maintenance of the road infrastructure of main and primary roads that eventually cut through the forest management area, where, during this period, the forest will be "untouched". In this way, a process of natural regeneration of the forest takes place, with the establishment of new arboreal individuals and the growth of the remaining trees that will be part of the 2nd and 3rd rotation cycle, also known as harvest cycle, expected to occur in the years: 30 +1 and 60 +1, after the first exploitation of each UPF.

The practice, in addition to keeping the "forest standing" and contributing to the maintenance of all its environmental functions and ecosystem services, presents itself as a viable practice to conserve the biodiversity of flora and fauna, meeting the social triad fair, environmentally adequate and economically viable.

The process of cutting mature trees is characterized as the "packaging" of carbon through the production of lumber, where a large number of hardwood species can last much longer than half a century without deteriorating.

In this way, enabling the opening of the forest canopy in the exploited (managed) area, providing an increase in the entry of light into the forest understory and the acceleration of carbon fixation rates, acting as a true global carbon filter ("sponge"), where its cycling is increased until the second forest harvest and so on, every 30-year period, probably with a neutral balance in carbon flow.

In order to make the most of the wood resource produced and diversify the property's productive matrix, the project foresees the installation of a complete wood industrialization plant, including sawmills, wood drying, processing and industrialization.

In addition, with the residues from the industrialization of wood and forest exploitation, the implementation of a thermoelectric plant with the use of biomass is planned, supplying all the company's demand for energy in its productive activities and also providing for the sale of electricity to supply the demand of the municipality. In this sense, it is worth noting that all the energy used in the municipality is produced with the burning of fossil fuels, non-renewable: oil, heavy fuel oil.

The forests found on the property are mostly classified as Dense Ombrophilous Forest, mainly non-floodable forests known as Terra-Firme - Dense Ombrophilous Forest of the Lowlands subformation, representing more than 95% of the property and the rest are Floodplain Forests - Dense Ombrophilous Forest of the Alluvial Subformation (less than 5% of the property).

History of PMFS

The sustainable forest management of BR ARBO Gestão Florestal S/A. has been approved since 1998 and is currently in force.

i. The Santa Rosa do Tenquê PMFS was presented and approved in 1998 and remains in force to this day, and will continue to do so until at least one complete harvest cycle is completed. At the time, in addition to the presentation of the Forest Management Plan, it was necessary to carry out an Environmental Impact Study (EIA) and the Environmental Impact Report (RIMA), in addition to holding public hearings. The PMFS has the following characteristics:

    a. With Formalized Process No. 0350/98, presented at IPAAM in 1998;

    b. Approved in 1998, with the Installation License L.I. No. 055/98, valid until the completion of the forestry exploitation of the entire area;

    c. With a total area of approved Forest Management of 29,789.52 hectares.

ii. In 2000, it obtained approval for the forestry exploitation of the first UPA (Annual Production Unit) – UPA-02, through the Operating License L.O. No. 385/00, valid for one year.

    a. Currently, the UPA is called UPF – Forest Production Unit and the Operating License is usually issued with two years of validity and extendable for another two years.

iii. In 2001, the company obtained the operating license for the second UPA (UPA02), through L.O. number 385/00-01;

iv. In 2002, after the operation of UPA-02, the company obtained authorization for the forestry exploitation of UPA-03, through L.O. No. 385/00-02.

   a. UPA-03 was partially exploited and after that the project was paralyzed.

v. In 2016, after consulting IPAAM for the resumption of the project, a request was made to expand the PMFS area.

   a. For the purposes of expanding the PMFS, it would be necessary to formalize a request for APAT – Authorization for Technical Analysis of Forest Management;

   b. In the APAT process, aspects of environmental registration (CAR), the documentary regularity of land tenure and ownership, and the absence of conflict in the area of interest with forest conservation units and indigenous lands are observed.

   c. On the occasion, IPAAM also noted the need to present a pending report regarding the operation of UPA-03, a fact promptly attended to and regularized.

vi. In 2016, IPAAM issued the approval of APAT, authorization No. 070/2016, for the resumption of the project, a request was made to expand the area of the PMFS to 251,706.64 hectares, valid for two years.

   a. Within a period of two years, the company should present a new POE – Forestry Operation Plan, referring to the APAT granted, supported by the 100% forest inventory of the new UPF;

   b. Without effect, despite APAT transcribing the documentary legality of the property and the appropriate environmental registry (CAR), after the two years expired in 2018, the expansion of the PMFS was not carried out.

vii. Also in 2016, for the purpose of formal guarantee, at the request of the company, IPAAM issued official letter No. 0920/2016/IPAAM-DT, saying that the PMFS was and is active and valid.

viii. At the beginning of 2017, BR ARBO's PMFS obtained the Forest Certification with the FSC-C135190 SCS-FM/COC-005966 seal.

   a. Certified in accordance with the applicable standard for native tropical forests, according to which the first principle to be met for the purposes of certification is compliance with all applicable legislation, such as environmental legislation (forest code and legislation applicable to the PMFS), tax, land and labor regulations, in addition to complying with all international treaties to which Brazil is a signatory.

ix. Now, recently, in May 2023, BR ARBO requested the old APAT renewal to increase the area that can be subject to a PMFS, but changing the intended forest management area to

a total gross area of about 191 thousand hectares, of which it intends to manage in the next 30 years a total of a net forest management and exploitation area of 163,713.0 hectares:

a. It will be subdivided into 30 forest production units (UPFs) exploited annually, with an average annual harvest area of 5,457 hectares, which may vary by up to 5% of the net area more or less.

b. Of the total gross area, a total of more than 12 thousand hectares was reserved as a technical reserve, which had been previously authorized with the concession of a new APAT for possible interest in expanding the net area of forest management and exploitation.

2. Current stage and progress in the process of expanding existing Forest Management.

The expansion of the managed area of the PMFS requires the preparation of two documents concomitantly: a) first the preparation of a new Operational Exploration Plan (POE) applicable to the new Forest Production Unit (UPF), for the purpose of obtaining a new Operating License and b) the updating of the general document of the PMFS, called the Sustainable Forest Management Plan.

On the other hand, the updating of the PMFS document and the preparation of a new POE have as a central part the realization of the 100% forest inventory.

The preliminary activities, necessary for the beginning of the work, have already been defined, needing only to wait for the effective approval of APAT and, as well as the techniques and dimensioning of teams and equipment have already been defined and are presented as an item in this report.

The execution of a new forest inventory implies the measurement of all trees with more than 40 centimeters in diameter existing in a recommended area of 5,457.1 hectares of net forest exploitation area.

The macro activity of forest inventory is complemented by two other secondary but equally important activities:

1st) The cutting of vines from trees defined as of commercial interest, which occurs infrequently, only when necessary (occasional);

2nd) The realization of the environmental microzoning of the UPF, where the most relevant aspects verified are the edaphic conditions of the soil, in the sense of offering resistance or difficulty for the construction of roads and yards for the accumulation of logs, as well as the drainage characteristics of the site.

In the effective execution of a new forest inventory, it is recommended to measure all trees with more than 40 centimeters in diameter existing in a recommended area of 5,457.1 hectares of net forest exploitation area. Where precise information about the trees is collected, such as species and quantitative parameters of height and diameter, stem quality and other attributes relevant to the selection of cut trees and seed trees. Jointly promoting the exact collection of the geographic

coordinates of each individual, always making use of computer resources, such as data collectors and specific software.

Activities prior to the elaboration of the POE and the updating of the PMFS.

Six preliminary activities to the forest inventory were carried out for the expansion of the PMFS and presentation of the POE of the new UPF, namely:

1) Preliminary definition of the forest potential of the property and carrying out an indicative diagnostic inventory.
2) Subdivision of the forest management area into forest production units (UPF's) to be implemented annually.
3) Preliminary planning of main roads and primary roads
4) Definition of the silvicultural system adopted and assumptions applicable to forest management;
5) Outline of the chronology of activities over the years;
6) Dimensioning of the main teams and main equipment for forest management with reduced impact exploitation.

In general terms, all six of these activities are listed as already executed and/or defined, where any adjustments may arise until the effective execution of the same and in the preparation or updating of the documents.

This set of activities is configured, in short, as the advances already achieved for the expansion of existing forest management.

2.1. Preliminary study of forest potential and diagnostic forest inventory.

In 2021, the company commissioned a preliminary study to define which areas have characteristics of logistics, soil, relief and expectations of occurrence of species of greater commercial interest.

For this preliminary study, we used secondary information and data, such as the RADAMBRASIL Project (a broad project carried out throughout the Brazilian Amazon by the Brazilian government in the 1970s and 1980s) and other prospecting inventories carried out by third parties in the area, as well as the results of the forest inventory of the first UPA's, carried out between 1998 and 2001 and the diagnostic inventory of the existing PMFS, held in 1998.

Additionally, on the occasion of carrying out the inventory for carbon quantification, carried out between the months of January and April 2023.

The systemic launch of the inventory of an area of 130 thousand hectares, all of it contained within the limits of the PMFS expansion area, made it possible to list the most abundant species of occurrence in the area.

It was also observed that the stock of mature trees with more than 50 centimeters of DBH (DBH) presented a listed volume of more than 100 m3/hectare, which represents at least 5 times more than the total volume that is intended to be extracted per hectare, for each 30-year cycle.

Table-01 shows the timber species predicted as potential; usual scientific name; its main timber characteristics, such as color pattern and bulk density; type of target market and main known timber uses.

Species	Scientific Name	Colouring Predominant of the Wood	Wood Density	Market Primary	Sawed off	Floor Flooring	Deck/S4S	Industrialized: MLC Panels	Mobile	Benefited other uses: Picture frames, Frames, Portals.
Pineapple	Persea laevigata	Greenish Brown	Intermediate	Internal	X			X		
Abiu	Pouteria caimito	Light shades of yellow and white	Lightweight	Internal/Export.	X			X		X
Abiurana	Pouteria guianensis	Light shades of yellow and white	Lightweight	Internal/Export.	X			X		X
Amapá	Brosimum parinarioides	White	Lightweight	Internal	X			X		X
Angelim-stone	Hymenolobium petraeum	Yellowish	Intermediate	Internal/Export.	X				X	X
Spotted Angel	Marmaroxylon racemosum	Yellowish Streak of Dark Colors	Intermediate	Internal	X			X	X	
White Macaw	Osteophloeum platyspermum	White/Yellowish	Lightweight	Internal	X			X		X
Scarlet Macaw	Iryanthera paraensis	Reddish	Intermediate	Internal	X			X		X
Balata	Chrysophyllum sanguinolentum	Reddish	Intermediate	Internal	X		?	X		
Pitch	Protium heptaphyllum	Light/Pink	Lightweight	Internal	X			X		
Cajuaçu	Anacardium giganteum	Light/Pink	Lightweight	Internal	X			X		
Cashew	Anacardium spruceanum	Light/Pink	Lightweight	Internal	X			X		
Carder	Scleronema micranthum	Rosy	Lightweight	Internal	X			X		X
Chestnut	Lecythis pisonis	Grayish brown	Intermediate	Internal	X			X		
Castanhasapucaia	Lecythis zabucajo	Brown Reddish	Intermediate	Internal	X			X		
Cedar	Erisma uncinatum	Reddish	Lightweight	Internal/Export.	X			X		X

Table 01.: Timber species with potential for forest exploitation observed in the forest inventory, scientific names, with their main characteristics, such as predominant color and apparent density of the wood, market and main uses for which they are intended. Continues...

Species	Scientific Name	Colouring Predominant of the Wood	Wood Density	Market Primary	Sawed off	Floor Flooring	Deck/S4S	Industrialized: MLC Panels	Mobile	Benefited other uses: Picture frames, Frames, Portals.
Cedromara	Cedrelinga catenaeformis	Rosy	Lightweight	Internal/Export.	X			X	X	X
Cumarú	Dipteryx odorata	Greenish Brown	Heavy	Export		X	X			
Cupiúba	Goupia glabra	Brown Reddish	Heavy	Internal/Export.	X		X			
Broad bean	Parkia spp.	Light/Pink	Intermediate	Internal	X			X		
Sourbean	Vatairea guianensis	Yellowish	Intermediate	Internal	X		?	X		X
Guariúba	Clarisia racemosa	Yellowish	Intermediate	Internal	X			X		
Ipê	Handroanthus serratifolius	Greenish Brown	Heavy	Export		X	X			
Itaúba	Mezilaurus itauba	Greenish Brown	Intermediate	Export			X			X
Jacareúba	Calophyllum brasiliensis	Light Red	Intermediate	Internal	X			X	X	X
Jarana	Ludic lecythis	Yellowish	Intermediate	Internal	X			X		
Jatoba	Hymenaea courbaril	Shades of red	Heavy	Export		X	X			
Jutaí-pororoca	Hymenaea parvifolia	Reddish brown	Heavy	Export		X	X			
Bay leaf	Ocotea spp.	Greenish Brown	Intermediate	Export	X			X		
Yellow blond	Rigid Lyrics	Greenish Brown	Intermediate	Internal	X			X		
Araba laurel	Ocotea sp.	Reddish brown	Intermediate	Internal	X			X		
Louro-aritú	Licaria aritu	Greenish Brown	Intermediate	Internal	X			X		

Laurel-trough	Ocotea rubra	Reddish brown	Intermediate	Internal/Export.	X			X	X	
Black blond	Nectandra reticulata	Greenish Brown	Intermediate	Internal	X			X		
Pink blonde	Aniba parviflora	Reddish brown	Intermediate	Internal	X			X	X	

Table 01.: Timber species with potential for forest exploitation observed in the forest inventory, scientific names, with their main characteristics, such as predominant color and apparent density of the wood, market and main uses for which they are intended. Continues...

Species	Scientific Name	Colouring Predominant of the Wood	Wood Density	Market Primary	Sawed off	Floor Flooring	Deck/S4S	Industrialized: MLC Panels	Mobile	Benefited other uses: Picture frames, Frames, Portals.
Macucu	Aldina heterophylla	Greenish Brown	Heavy	Internal	X		?	X		
Maparajuba	Manilkara bidentata	Red	Intermediate	Export			X			
Marupá	Simarouba amara	White	Lightweight	Internal/Export.	X			X	X	X
Matamatá	Eschweilera coriacea	Grayish brown	Intermediate	Internal	X			X		
Muiracatiara	Astronium lecointei	Burst in reddish tones	Intermediate	Internal	X			X		
Muirapiranga	Brosimum rubescens	Red	Heavy	Internal	X		?			
Pama	Perebea mollis	White/Cream	Lightweight	Internal	X			X		
Pequiá	Caryocar villosum	Pale Yellow	Heavy	Internal/Export.	X					
Pechiarana	Caryocar glabrum	Pale Yellow	Intermediate	Internal/Export.	X					
Ripper	Eschweilera micrantha	Grayish brown	Intermediate	Internal	X			X		
Purple	Peltogyne catingae	Purple Purple	Heavy	Internal/Export.	X	?	?	X	X	
Sip	Couma guianensis	Yellowish white	Lightweight	Internal	X			X		

Yellow Sucupira	Enterolobium schomburgkii	Pale Yellow Gust	Intermediate	Internal	X			X	X	
Black Sucupira	Diplotropis purpura	Brown to black	Heavy	Export./Domestic		?	?			X
Red Sucupira	Andira parviflora	Dark reddish	Heavy	Export./Domestic		?	?			X
Tanibuca	Buchenavia capitata	Greenish	Heavy	Internal	X		?			

Table 01.: Timber species with potential for forest exploitation observed in the forest inventory, scientific names, with their main characteristics, such as predominant color and apparent density of the wood, market and main uses for which they are intended. Continues...

Species	Scientific Name	Colouring Predominant of the Wood	Wood Density	Market Primary	Sawed off	Floor Flooring	Deck/S4S	Industrialized: MLC Panels	Mobile	Benefited other uses: Picture frames, Frames, Portals.
White Tauari	Couratari guianensis	White/Yellowish	Lightweight	Internal/Export.	X			X	X	X
Red Tauari	Cariniana micrantha	Rosy	Lightweight	Internal	X			X		X
Taxi	Sclerolobium paniculatum	Grayish brown	Intermediate	Internal	X			X		
Try	Ormosia paraensis	Reddish	Intermediate	Internal	X			X		
Timborana	Piptadenia suaveolens	Brown Brown Clear	Intermediate	Internal	X		?	X		
Tintarana	Vochysia guianensis	Grayish brown	Intermediate	Internal	X			X		
Ucuúba	Virola melinonni	Light Red	Lightweight	Internal	X			X		X
Urucurana	Sloanea grandiflora	Brown Brownish	Intermediate	Internal	X			X		
Uxi-smooth	Endopleura uchi	Reddish	Heavy	Internal	X		?	X		
Uxirana	Sacoglottis amazonica	Reddish	Heavy	Internal	X		?	X		
Uxi-roasted	Sacoglottis guianensis	Reddish	Heavy	Internal	X		?	X		
Xuru (Tauari)	Allantoma lineata	Yellow Pale/Cream	Intermediate	Internal/Export.	X			X	X	X

Table 01.: Timber species with potential for forest exploitation observed in the forest inventory, scientific names, with their main characteristics, such as predominant color and apparent density of the wood, market and main uses for which they are intended. Final.

2.2. Subdivision of the forest management area into forest production units (UPF's).

The installation of 30 annual forest production units was prescribed, designed for exploitation between the 2025/2026 biennium and the 2054/2055 biennium.

For the subdivision of forest management into UPF, it took into account the natural limits, potential for forest production, the need to build more elaborate infrastructures, such as bridges mainly, and the distance to the farm headquarters, the place chosen for the installation of sawmills and the entire industrial complex.

The UPFs were established in such a way that they present a net area of expected forest exploitation of about 5,457.1 hectares each, which may vary after microzoning, to values close to more or less 5%. Still, they can be adjusted annually according to the need or local reality.

The location of the UPF's, illustrating the respective biennium foreseen for the exploitation of each of them, is presented on a map in the annexes section.

Table 01, which follows, presents each of the UPFs, with their respective total area and the estimate of the effective area of forest or productive exploitation. Also listing the probable biennium of exploitation of each UPF.

UPF	Year	Total area of the UPF (hectares)	Planned Forest Exploitation Area (hectares)
UPF-01	(2025/26)	5.973,8	5.457,1
UPF-02	(2026/27)	5.954,1	5.457,1
UPF-03	(2027/28)	6.061,4	5.457,1
UPF-04	(2028/29)	5.948,2	5.457,1
UPF-05	(2029/30)	5.983,5	5.457,1
UPF-06	(2030/31)	6.131,2	5.457,1
UPF-07	(2031/32)	6.155,3	5.457,1
UPF-08	(2032/33)	6.099,3	5.457,1
UPF-09	(2033/34)	6.142,8	5.457,1
UPF-10	(2034/35)	6.001,6	5.457,1
UPF-11	(2035/36)	6.028,4	5.457,1
UPF-12	(2036/37)	6.065,1	5.457,1
UPF-13	(2037/38)	6.158,1	5.457,1
UPF-14	(2038/39)	6.171,5	5.457,1
UPF-15	(2039/40)	6.001,5	5.457,1
UPF-16	(2040/41)	5.978,6	5.457,1
UPF-17	(2041/42)	5.994,3	5.457,1
UPF-18	(2042/43)	5.982,6	5.457,1
UPF-19	(2043/44)	6.032,5	5.457,1
UPF-20	(2044/45)	6.003,0	5.457,1
UPF-21	(2045/46)	5.995,4	5.457,1
UPF-22	(2046/47)	6.037,1	5.457,1
UPF-23	(2047/48)	5.944,4	5.457,1
UPF-24	(2048/49)	5.975,7	5.457,1

UPF-25	(2049/50)	6.124,5	5.457,1
UPF-26	(2050/51)	6.123,8	5.457,1
UPF-27	(2051/52)	6.092,8	5.457,1
UPF-28	(2052/53)	6.106,7	5.457,1
UPF-29	(2053/54)	6.078,6	5.457,1
UPF-30	(2054/55)	6.073,8	5.457,1
Sum of UPF's		181.419,6	163.713,0
Technical reserve		12.283,2	-
Non-productive areas (NDA)		313,4	-
Total do PMFS		194.016,2	

Table 01.: Subdivision of the forest management area (FMA) into forest production units (UPF's). Relating the number of the UPF with the biennium of probable forest exploitation. The gross area and planned area of effective exploitation for each UPF are included, with a variation of 5%.

2.3. Macro Planning of Forest Roads

In this phase, which precedes the forest inventory, it is also necessary to proceed with the macro-planning of forest roads. Preliminarily allocating the main roads and primary roads.

The preliminary planning of the roads mainly takes into account the location of rivers and streams and the conditions of relief and soil. And the need for this planning is transcribed for better distribution and location of the UPF's.

In general terms, in this phase, only the main and primary roads are allocated, which have a provision for a construction standard that we call "Type A" which has as characteristics the construction of the base, sub-base and traction bed (usually with a large grain size finish – such as "piçarra" or pebble, or even with the waterproofing of the roadway. All this, in such a way that it is able to guarantee trafficability and forest transport in the conditions from the beginning of the dry season (less rainfall) to the beginning of the rainy season.

The planning is preliminary, and may undergo changes after studies of ground elevations and the direction of drainage flow, carried out with geoprocessing techniques and acquisition of data from the surface of the terrain, through the use of UAVs coupled with a "LIDAR" sensor capable of producing altimetric maps with decimetric precision (10 cm).

In addition to the attached map, which illustrates the location of the UPF's, the main roads and primary roads are also allocated, with a length of 269.5 and 128.5 km, respectively.

By internal definition, the main roads are those that connect two or more UPF's to the state highways and, consequently, to the log yard of the sawmills. Primary roads, on the other hand, are those used to harvest at least 35% of the area of a UPF. All of them have an "A" type construction pattern.

The other roads or branches, secondary and tertiary, will only be planned after the execution of the UPF Microzoning in the field, with the collection of local data, of the entire length of the UPF during the 100% forest inventory (also called forest census).

2.4. Silvicultural system adopted and premises applicable to forest management

Briefly, the main characteristics that outline Sustainable Forest Management are presented, namely:

- Forest management system called polycyclic, with a cutting cycle initially stipulated in 30 years according to Resolution 17/2013 of SDS/CEMAAM and Resolution 406/09 of CONAMA, which establishes maximum values of Average Annual Increase - IMA of 0.86 m³/ha/year (CONAMA) and one (01) m³/ha/year (SEMA-AM); with a maximum permitted exploitation volume of 25 m³ per hectare (Resolution 17/2013 – SDS/CEMAAM) is 30 m³ per hectare (Resolution 406/09 CONAMA);
- Carried out through selective cutting of commercial species;
- Minimum cutting diameter for all species of 50 centimeters at breast height (DBH 1.30 meters from the ground);
- Forest inventory from 40 centimeters of DBH;
- Forest exploitation system characterized as Reduced Impact Exploitation (EIR), adapted from the CELOS Exploitation System (SCE) and with some adaptations from the systems disseminated by IMAZON and FFT (Tropical Forest Foundation);
- Silvicultural system that advocates the conduction of natural regeneration with adaptations of the CELOS Silviculture System (SCS), supported by regional experiences of the system recommended by EMBRAPA/CPATU (SILVA et al. 1995) and by the Department of Tropical Silviculture of INPA (HIGUCHI et al., 1991).
- The maximum average volume for harvesting in each UPF was estimated at 20 m³/hectare. In other words, conservatively, we plan and intend to harvest a volume 20% lower than the maximum allowed per hectare (25 m³/hectare).
- Likewise, considering the values of annual forest increment contained in resolution 406/09, which prescribes an increase of 0.86 m³/hectare/year, we would have a cut/rotation cycle of approximately 24 years, however, conservatively, we prescribe and plan a rotation cycle of 30 years. Where, for each UPF harvested, the return to a new forest harvest will only occur after 30 years have elapsed since the first harvest.

Sustainable Forest Management and Reduced Impact Logging (EIR) practices.

In general, the operational practices of the exploitation of Forest Management differ from the practices already described of the forest exploitation for the suppression of vegetation by the need for greater care with the remaining forest, where the main differences consist of:

- Rigorous planning and selection of forest species and individuals that will be exploited and those retained standing for seed bearing, regeneration and composing the harvest stock in the second rotation cycle;
- Careful planning of forest exploitation infrastructures;
- Application of techniques of targeted cutting of trees and prior cutting of vines, in order to better conserve the remaining trees that will make up the second harvest cycle;

- Elaborated process of planning trails, including the demarcation of these trails in the field, in order to cause less damage to the remaining trees and to natural regeneration, in order to avoid unnecessary or exaggerated movement of forestry tractors;
- Implementation of a chain of custody control process for harvested trees and logs produced;
- Management through specific software for the activity and use of geoprocessing tools;
- Implementation of a monitoring plan to monitor the growth of the forest, maintenance of permanent infrastructures (main roads) and, mainly, actions for the monitoring and protection of the forest, especially to curb invasions.

2.5. Multi-year chronology of the main management activities within a cutting or rotation cycle and their brief description:

Chart 02 below shows the main activities involved in the forest management project.

Table 02: Chronology of the activities that make up the silvicultural system and forest management.

E-1 (years)	Delimitation and subdivision of the compartment	Delimitation of the Forest Production Unit (UPF) and the Work Units (UT's) based on the boundaries of the property; opening of the baseline for opening the central stings of the lanes (indent); opening of central (parallel) stings of the strips (every 50 meters) to the boundaries of the property and marking of the extent of the sting (50 x 50m); identification of the UPF.
E-1 (years)	100% inventory for exploration planning	Measurement of trees of all species, with DBH equal to or greater than 40 cm, stem quality and spatial location (obtaining geographic and Cartesian coordinates), identification of trees, numbering and tagging of trees and annotation of other attributes of the environment to assist in microzoning;
E-1 (years)	Silvicultural Treatment (Cutting of vines)	Cutting of vines in trees of commercial species with a high degree of infestation to reduce the damage of the exploitation and improve the safety of the tree cutting operation.
E – 4 Months	Exploration planning	Selection of trees for felling; road network planning; Elaboration of exploration maps with location of the selected trees for cutting and other exploration and transport infrastructures;
E- 1 month	Opening of forest roads, sidings and yards	Opening of temporary, secondary and tertiary forest roads, as well as; opening of yards along roads and branches;

And*	Logging	Low-impact exploitation: pre-selection of trees to be felled according to criteria per species; exploration map for the location of trees in the field; test to see if the tree is hollow; fall targeting to reduce damage and facilitate dragging; daily update of the exploration map for planning trails; dragging the main (to the nearest yard on the branches) and transporting the logs;
E+3 months	Assessment of the damage caused	Processing of information from exploration and control maps; measurement of the area of trails; systematic evaluation of the percentage of canopy opening; A maximum of three months after the completion of the logging.
E+4 (years)	Silvicultural treatments	• Up to 5 years after exploration Release: girdling and poisoning of trees of non-commercial species that are competing with trees of the future (DBH>=35 cm). Prescription of new treatments based on the analysis of data from the permanent plots (and diagnostic inventory if possible) (available at 8 and 13 years after logging) following the same guidelines as the first • The decision to carry out or not to carry out the activity, based on data from permanent plots.
E+2 (years)	Maintenance of the Infrastructure of culverts, bridges or bridges. (if any)	• Verify the condition of the eventual construction of culverts, bridges or bridges, to avoid the impoundment of water inside the Forest Management Area (AMF) and the property; • If there is impoundment with continuous retention of water (for more than three months), unclog the watercourse and even eliminate the infrastructure (as a last resort).
E+4 E+9 E+14 (years)	Silvicultural treatments (optional)	• Up to 5 years after exploration. Practice of releasing trees of interest: implying girdling and poisoning of trees of non-commercial species that are competing with trees of the future (DBH>=35 cm). Prescription of new treatments based on the analysis of data from the permanent plots (and diagnostic inventory if possible) (available at 8 and 13 years after logging) following the same guidelines as the first • The decision to carry out or not to carry out the activity, based on data from permanent plots.

E+4 E+6 E+9 E+13 E+18 (years)	Maintenance of the Infrastructure of culverts, bridges or bridges. (if any)	• Verify the condition of the possible construction of a culvert, bridge or bridge to avoid the impoundment of water inside the MFA and the property; • If there is impoundment with continuous retention of water (for more than three months), unclog the watercourse and even eliminate the infrastructure (as a last resort).
E+29 (years)	100% inventory for planning the exploration of the second cutting cycle	Measurement of trees of all species, with DBH equal to or greater than 40 cm, stem quality and spatial location (obtaining geographic and Cartesian coordinates), identification of trees, numbering and tagging of trees and annotation of other attributes of the environment to assist in microzoning;
Annually	Forest protection	• Go through the boundaries of the property, of the forest management area in order to curb invasions; • If agricultural crops are implanted in the surrounding areas or pastoral projects are implemented, verify the need to maintain "firebreak" areas, to prevent the entry of fires into the forest.

*E: Forest Exploitation (period and/or year of forest exploitation).

2.6. Dimensioning of the main operational activities of Forest Management and Reduced Impact Logging (RIL):

The planning of the number of equipment and teams needed for the main activities of Sustainable Forest Management, including the stages of forest inventory, reduced impact forest exploitation (EIR: directional cutting of trees, demarcation of trails, dragging and organization of logs in a yard) and transportation are presented in Chart 03.

Activities (Line of Design)	Team/Equipment	Quantitative	Unit	Yield Operational	Units	Duration (months)	Quantity Minim	Complement
Forest Inventory at 100%	Inventory Teams	5,457	hectares	350	hectares/month/team	5	4	Six people Each team with
Directional Cutting of the Trees	Cutting Crews	109.142	m3	2,400	m3/team/month	5	10	two people Each team with
Demarcation of the Drag	Trail Teams	5,457	hectares	220	hectares/team/month	5	5	two people
Log Drag	Tractor Skidders	109.142	m3	4,500	m3/equip./month	5	5	Skkiders
Infrastructure exploitation	D-6 Crawler Tractor	5,457	hectares	1	Treadmill for every 3 Skkiders	5	2	Tractor D-6 Treadmills
Accommodation and Loading the logs	Wheel Loaders	109.142	m3	9,000	m3/equip./month	5	3	Wheel Loaders
Log transport Trailer Trucks	Semi-4,800	109.142	m3/set/month	6	4 Trucks			

Table 03.: Dimensioning of production teams and equipment for the intervention in the first 30-year cycle of the project.

In the analysis of Table 03, it can be inferred:

i. The numbers of equipment needed and teams are presented in an optimized way to minimally meet the demand over the estimated period of time for each stage. It is important to emphasize the need to work with an additional surplus of at least 10% of equipment per activity.

ii. An excellent forest inventory, combined with a microzoning of the entire net area of the Forest Production Unit (UPF – 5,457 hectares, with about 6,000 hectares inventoried per UPF, on average) that will be harvested that year is essential for all the success of subsequent operations. A team of six people, including a botanical identifier, annotator and forestry assistants, is capable of covering a minimum average area of 350 hectares per month. The activities are directed at the end of the "dry season" and the transition to the season of greater rainfall. The team will also carry out the pre-cutting of vines. Thus, a total of four (04) teams for a period of up to five (05) months are sufficient for the operation.

iii. The directional cutting operation of the selected trees foresees an average yield per cutting team, projecting the cutting of 30 to 35 trees per day, usually composed of a chainsaw operator and an assistant, predicting a total average minimum cutting volume of 2,400 m3 of logs/month/team. Although this operation applies reduced impact exploration techniques (EIR – directional cutting of trees), the training of the teams ensures that the same performance as in traditional operations is maintained.

iv. The planning of the exploration infrastructure using geoprocessing tools and the demarcation of the trails of dragging in the field provide the optimization of the dragging operation of the logs and use precepts of exploration of reduced impact, providing the optimization of the trailing distances, reduction of the movement of machines and avoids unnecessary damage to the remaining trees of the second harvest. A two-person team, with the

The use of cutting and logging maps allows the demarcation of at least an area of 220 hectares per team per month.

v. The activity of dragging the logs was dimensioned for the use of CAT 525 model forestry tractors, equipped with hydraulic grippers, dispensing with the use of steel cables and forestry helpers in the operation, foreseeing a minimum average monthly production of 4,500 m3 of dragged logs per month, which allows projecting the execution of the work even less than the projected five months. using only five "Skidders" forwarders.

vi. In reduced impact exploration (EIR) operations in forest management areas, for each set of three "Skidders" a crawler tractor is required for the installation of the exploration infrastructure, opening of transport branches and log accumulation yards for transport. Where for the five (05) Skidders type forwarders, up to two D-6 type crawler tractors with attached winch and Track-Skidders are required. It is worth mentioning that if there is an operational surplus, the same equipment is also used for dragging logs. vii. In the operations that involve the handling of the logs: accommodation in piles and loading of them, each machine is capable of moving about 400 m3 of logs, calculated for the project a minimum monthly average of 9,000 m3 per loader equipped with a forestry fork, which implies the minimum need for three loaders equipped with a forestry "fork" to move the logs. viii. Transportation of the logs. It is estimated that for the first few years, until it reaches about 45 thousand hectares of forest exploitation area, the average distance of transport of the logs will be slightly less than 25 km. In this way, each set of semi-trailer truck can provide about 3 trips a day. For calculation purposes, a transportation amount of 4,800 m3 of

logs/month was considered, which will give to the projected volume of exploration production the need to acquire or contract a minimum of four (04) sets of semi-trailer trucks, during an operation period of up to six months per year.

ix. A dedicated support team is designed to meet the needs of low-impact forest exploitation, namely:

a. One (01) tank truck (4X4 or 6X4) with a transport capacity of 12,000 liters of fuel, to transport fuel from the farm's headquarters to the work front, for distribution purposes to the supply and maintenance convoys and also for direct supply of equipment;
b. One (01) convoy truck for fueling and lubrication of the machines ("mellow");
c. One (01) mobile workshop, mounted on a 4X4 truck chassis, to be used for small repairs and corrective maintenance, containing compressor, generator set, welding machine, grinder, hydraulic press, wrenches and tools, for quick services in the field.
d. Three (03) 4X4 pick-up vehicles, for supervision, support and support of low-impact forest exploitation activities.

2.7. General schedule of the annual activities of the Inventory, Management and Forest Exploitation

	Ano Zero					Ano 01											
Atividades da Linha de Projeto	Ago	SET	Out	Nov	Dez	Jan	Fev	Mar	Abr	Mai	Jun	Jul	Ago	Set	Out	Nov	Dez	Limite
1. Inventário Florestal (100%) e Projetos																		5 meses
2. Exploração Florestal de Impacto Reduzido-EIR																		7 meses
2.1. Corte Direcional das Árvores																		5 meses
2.2. Demarcaçao das Trilhas de Arraste e Infra																		5 meses
2.3. Abertura da Infraestrutura de Exploração																		5 meses
2.4. Arraste das Toras																		5 meses
2.5. Transporte das Toras																		6 meses
	ES				T.	Estaçõa Chuvosa					Transição	Estação Seca (ES)					T.	

Table 04.: Annual schedule of the main activities of forest management and exploitation, highlighting the illustration in relation to the occurrence of rainfall.

Table 04 presents the order of the main activities that involve from the 100% forest inventory stage to the effective conclusion of the exploitation stage, which occurs with forest transport. The correlation of these activities with the prevailing climatic conditions in relation to the monthly rainfall is also illustrated in the table. It can be observed:

i. The first effective activity in the field is the forest inventory, which should preferably be carried out in the period of lower rainfall. Whenever possible, the subsequent inventory is carried out
concomitantly with the previous year's logging;

ii. The activities that involve the handling of machines and trucks are, of course, concentrated in the less rainy season, which in this case, we call the "dry season", starting in the last month of transition from the rainy season to the season of less precipitation ("dry season" – the month of July) until the beginning of the transition

period, in this case restricted to transport activities and mechanized deforestation (December).

iii. The activity of cutting trees can start earlier, even in the month of June, at the beginning of the transition period from the rainy season to the "dry season". This is because the main activity does not involve the use and movement of heavy machinery. iv. On the other hand, the opening of the exploration infrastructure is concentrated in the period of less rainfall, since the excess of water in the soil would make it impossible to build most of the infrastructures.

However, specifically, to update the expansion of the PMFS, for the first 100% forest inventory, for the presentation of the new POE – Operational Exploration Plan, the first UPF and the start of forest exploration activities, the following schedule is underway (Table 05):

	2024												2025		
Atividades para ampliação do Manejo Florestal	Jan	Fev	Mar	Abr	Mai	Jun	Jul	Ago	Set	Out	Nov	Dez	Jun	Jul	Ago
1. Atividades já realizadas															
Avaliaçao do potencial florestal	Estudos realizados em 2021 e 2023														
Definição das técnicas de manejo e exploração florestal	Abril de 2022														
Definição do tamanho das UPF's	Abril de 2022														
Dimensionamento de Equipes e Equipamentos	Abril de 2022														
Solicitação de APAT para ampliação do PMFS	Maio de 2023														
Subdivisão da Área de Manejo Florestal em UPF's	Novembro de 2023														
Locação Preliminar das Estradas Principais e Primárias	Novembro de 2023														
	2024												2025		
2. Atividades de Implantação da ampliação do PMFS	Jan	Fev	Mar	Abr	Mai	Jun	Jul	Ago	Set	Out	Nov	Dez	Jun	Jul	Ago
Execução do Inventário Florestal 100%															
Confecção do POE e Atualização do PMFS															
Aprovação do Novo POE															
Construção das Estradas Florestais															
Primeiros testes da exploração florestal															
Início da Exploraçao Florestal															
Início do Transporte de Toras															
	Estação Chuvosa (EC)					Transição		Estação Seca (ES)				T.	Transição		(ES)

Table 05.: Schedule under implementation for updating the PMFS, presentation of a new POE, and carrying out the forest exploitation of the first UPF (UPF-01, 2024/2025).

Exceptionally, as can be seen by comparing tables 04 and 05, the 100% forest inventory of UPF-01 will be carried out during the rainy season.

Official documents cited in this report can be found at:

https://drive.google.com/drive/folders/1ocHv6vcA2VPu2B2eBMgTHhwSLoK0wTJC?usp=drive_link.

Manaus, December 13, 2023.

Ricardo Luiz Ludke
Forest Engineer, M.Sc. (Technical Manager)
Director of Forestry Operations at BR ARBO