Draft Regulations

Draft Regulation

Environment Quality Act
(chapter Q-2)

Act mainly to ensure effective governance of the fight against climate change and to promote electrification (2020, chapter 19)

Afforestation and reforestation projects eligible for the issuance of offset credits on privately-owned land

Notice is hereby given, in accordance with sections 10 and 11 of the Regulations Act (chapter R-18.1), that the Regulation respecting afforestation and reforestation projects eligible for the issuance of offset credits on privately-owned land, appearing below, may be made by the Minister of the Environment and the Fight Against Climate Change on the expiry of 45 days following this publication.

The draft Regulation sets the conditions, in concordance with the amendments made by the draft Regulation to amend the Regulation respecting a cap-and-trade system for greenhouse gas emission allowances, on which afforestation and reforestation projects on privately-owned land may be eligible for the issuance of offset credits. It also sets the general conditions governing the implementation of such projects.

The draft Regulation introduces a mechanism for giving notice of a project to inform the Minister that the promoter of an eligible project intends to file an issuance request for offset credits in the future.

The draft Regulation defines the methods used to quantify the greenhouse gas withdrawals attributable to an eligible project and establish a project outcome that leads to the issuance of offset credits under the Regulation respecting a cap-and-trade system for greenhouse gas emission allowances (chapter Q-2, r. 46.1). It also prescribes the contents of the project plan that a promoter must produce when filing a project, as well as the contents of the project report that must be produced for each reporting period. The draft Regulation sets the conditions that apply to the verification of project reports, in particular concerning the accreditation of the verification organization and the independence of the organization, the verifier and the other members of the verification team with respect to the promoter.

Lastly, the draft Regulation includes monetary administrative penalties for failures to comply and penal sanctions for offences.

The draft Regulation will have a limited impact on enterprises since it essentially targets the creation of afforestation and reforestation projects eligible for the issuance of offset credits on private land.

Further information concerning the draft Regulation may be obtained by contacting Pierre Bouchard, coordinator, Direction du marché du carbone, Direction générale de la réglementation carbone et des données d'émission, Ministère de l'Environnement et de la Lutte contre les changements climatiques, Édifice Marie-Guyart, 675, boulevard René-Lévesque Est, boîte 30, Québec (Québec) G1R 5V7; email: pierre.bouchard@environnement.gouv.qc.ca.

Any person wishing to comment on the draft Regulation is requested to submit written comments within the 45-day period to Kim Ricard, Associate Director, Direction du marché du carbone, Direction générale de la réglementation carbone et des données d'émission, Ministère de l'Environnement et de la Lutte contre les changements climatiques, Édifice Marie-Guyart, 675, boulevard René-Lévesque Est, boîte 30, Québec (Québec) G1R 5V7; email: kim.ricard@environnement.gouv.qc.ca.

Benoit Charette
*Minister of the Environment and
the Fight Against Climate Change*

Regulation respecting afforestation and reforestation projects eligible for the issuance of offset credits on privately-owned land

Environment Quality Act

(chapter Q-2, ss. 46.1, 46.5, 46.8.2, 115.27 and 115.34)

Act mainly to ensure effective governance of the fight against climate change and to promote electrification

(2020, chapter 19, s. 21)

TITLE I
OBJECT, SCOPE AND INTERPRETATION

1.   The object of this Regulation is, with the aim of mitigating climate change by reducing the atmospheric concentration of greenhouse gases by sequestrating carbon in forest ecosystems, to

(1)   determine which afforestation and reforestation projects on privately-owned land are eligible for the issuance of offset credits under section 46.8.2 of the Environment Quality Act (chapter Q-2);

(2)   set the conditions and methods applicable to such projects;

(3)   determine the information and documents that a person or a municipality responsible for the implementation of an eligible project or a project whose eligibility has yet to be determined must keep or file with the Minister.

2.   In this Regulation, unless otherwise indicated by the context,

"afforestation" means the activity of creating forest cover by natural or artificial means on a lot or part of a lot assigned to non-forestry purposes;

"aggregation of projects" means a grouping of several eligible projects under the responsibility of the same promoter;

"anhydrous biomass" means biomass with a moisture level close to 0%;

"baseline scenario" means the scenario based on all the information and data needed to define the annual changes in carbon stock in the carbon reservoirs for a project as it would have been had no project been implemented in accordance with this Regulation;

"biomass" means all organic mass of plant origin present in a project's carbon reservoir;

"biophysical characteristics" means the information and data gathered during an inventory to define the topography, soil, deposits and drainage, tree population and cover of ligneous and non-ligneous vegetation strata and, where applicable, the category of the fallow land present on a lot or part of a lot used for a project and on an equivalent lot or part of a lot;

"calculation tool" means the calculation tool designed by the Ministère du Développement durable, de l'Environnement et des Parcs to calculate the effect of a project's GHG flows on radiative forcing and establish the number of offset credits to be issued pursuant to the Regulation respecting a cap-and-trade system for greenhouse gas emission allowances;

"cap-and-trade system for emission allowances" means the cap-and-trade system for greenhouse gas emission allowances established by the Regulation respecting a cap-and-trade system for greenhouse gas emission allowances;

"carbon sequestration" means the process that captures CO_2 from the atmosphere to store carbon in the carbon reservoirs constituted by living aerial biomass and living belowground biomass and then in a project's other carbon reservoirs;

"CBM-CFS software" means the software used for the Carbon Budget Model of the Canadian Forest Sector, designed by Natural Resources Canada;

"DBH" means diameter at breast height;

"dead biomass" means the biomass present in woody debris, including stems, branches and snags present on the lot or part of a lot used for a project;

"deforestation" means the activity of harvesting trees on a lot or part of a lot assigned to forestry purposes with a long-term view to allowing other land uses;

"DSH" means diameter at stump height;

"early project" means a project that began after 31 December 1989 but before (*insert the date of coming into force of this Regulation*);

"equivalent lot or part of a lot" means a lot or part of a lot that is not used for a project, but has plant or forest characteristics that are equivalent to those found on a lot or part of a lot used for a project before it is implemented, and on which the promoter has conducted a biomass inventory to gather the information and data needed to characterize the baseline scenario for an early project;

"executive officer" means the president, chief executive officer, general manager, chief financial officer or secretary of a legal person or business corporation or any person performing a similar role or designated as such by a resolution of the board of directors;

"fallow grassland" means fallow land characterized by the presence of herbaceous species covering more than 75% of the area to be managed. Some shrubs may be observed;

"fallow land" means a parcel of agricultural land that has been abandoned for at least 5 years after having been cultivated, with no crops planned over the short term (3 to 5 years) but which may, occasionally, be mowed by the owner solely to control invasion by ligneous vegetation. In this Regulation, fallow land is divided into three categories: "fallow grassland", "fallow shrubland", and "fallow woodland";

"fallow shrubland" means fallow land characterized by the presence of herbaceous plants covering less than one-third of the area to be managed. The area covered by shrubs (current height less than 1.5 to 2 metres) is more than two-thirds of the area to be managed;

"fallow woodland" means fallow land characterized by the presence of tree species over 2 metres in height covering less than 25% of the area to be managed;

"forest development activity" means an activity referred to in paragraph 1 of section 4 of the Sustainable Forest Development Act (chapter A-18.1);

"greenhouse gas" or "GHG" means one or more of the greenhouse gases referred to in the second paragraph of section 46.1 of the Environment Quality Act and the second paragraph of section 70.1 du Regulation respecting a cap-and-trade system for greenhouse gas emission allowances (chapter Q-2, r. 46.1), namely carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoruride (SF_6), nitrogen trifluoride (NF_3), chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs);

"initial context for a project" means the information and data gathered during the initial characterization to define the history of land uses and, where applicable, the silvicultural management strategies or natural disturbances that led to the forest characteristics observed prior to the implementation of the project;

"initial inventory" means all the information and data gathered on a lot or part of a lot for a project and, where applicable, on an equivalent lot or part of a lot to determine the carbon stock in the carbon reservoirs for a project at the project start date or, for an early project, at the project filing date;

"issuance inventory" means all the information and data gathered on a lot or part of a lot for a project in order to establish the outcome of the project at the end of a reporting period;

"living aerial biomass" means the biomass present in the tree, shrub, grass and moss vegetation strata. The tree stratum includes the merchantable portion of stem wood, stem bark, leaves on trees, branches, saplings, non-merchantable timber stems, crowns and stumps;

"living below-ground biomass" means the biomass present in the large roots and fine roots of the ligneous species present on the lot or part of a lot used for a project;

"lot or part of a lot assigned to forestry purposes" means a lot or part of a lot where timber production is mandatorily or temporarily possible. This category includes both productive and unproductive forest lots and parts of forest lots;

"lot or part of a lot assigned to non-forestry purposes" means a lot or part of a lot, with or without an ecological characterization, where timber production is mandatorily or temporarily excluded. Such lots or parts of lots, with less than 25% of cover density, are generally assigned to other purposes, such as urban development, industrial activities, mining, agriculture, tourism or vacationing. In addition, they are qualified as agricultural, non-forest or man-made depending on their characteristic degree of disturbance (from little to very disturbed). In these cases, the notion of disturbance is connected to a human activity that changes the physical characteristics of the environment (deposit, deposit depth, drainage, slope) and therefore the resilience of the forest;

"privately-owned land" means land that is neither land in the domain of the State pursuant to the Act respecting the lands in the domain of the State (chapter T-8.1) nor land belonging to a municipality;

"productive forest lot or part of a lot" means a lot or part of a lot able to produce 30 m³ or more of ligneous matter per hectare in less than 120 years. Such lots or parts of lots are said to be assigned to forestry purposes because they are occupied by forest stands (natural, tended or planted);

"professional" means a professional within the meaning of section 1 of the Professional Code (chapter C-26); "boo" any person authorized by a professional order to perform an activity reserved for the members of that order is deemed to be a professional;

"project outcome" means the net GHG flows resulting from a comparison of the GHG flows for a project scenario with the GHG flows for a baseline scenario in order to define the effect on radiative forcing and determine the number of offset credits to be issued to a promoter pursuant to the Regulation respecting a cap-and-trade system for greenhouse gas emission allowances (chapter Q-2, r. 46.1);

"project scenario" means a scenario based on all the information and data needed to define the annual changes in carbon stock in the carbon reservoirs for a project when a project is implemented in accordance with this Regulation;

"promoter" means a person or municipality responsible for the implementation of a project eligible for the issuance of offset credits;

"radiative forcing" means the variation in radiation (the difference between incoming irradiance and outgoing irradiance, expressed in W/m2) at the tropopause or upper limit of the atmosphere, due to a change in an external climate change factor, such as a change in carbon dioxide concentration or solar radiation;

"reforestation" means the reconstitution of the forest cover by natural or artificial means such as planting or seeding to compensate for one or more problems affecting the density of a forest stand, the distribution of trees within a forest stand or regeneration following a natural disturbance;

"reporting period" means a continuous period, within an eligibility period, during which the GHG withdrawals or offset credits corresponding to GHG withdrawals from the atmosphere attributable to a project eligible for the issuance of offset credits are quantified pursuant to this Regulation for the issue of offset credits;

"snag" means a standing dead tree, whether whole or not, at a given stage of decomposition;

"soil" means the part of the soil composed of organic matter (litter, fibre and humus) and part of the upper layer of the surface mineral horizon;

"timber forest products" means products created through the primary or secondary processing of logs. Timber forest products are subdivided into timber forest products with a short, medium or long lifespan. They include sawwood, particle board, veneer, plywood, pulp and paper, cardboard and energy products (granules, firewood, biofuels, etc.);

"unproductive forest lot or part of a lot" means a lot or part of a lot that is unable to produce 30 m^3 or more of ligneous matter per hectare in less than 120 years. This category includes all lots or parts of lots with a density below 25% and a height that does not exceed 10 m at maturity (120 years). A stand less than 120 years old may be considered as an unproductive forest stand when its density is below 25% and there is no sign that the cover will densify. If a major disturbance has affected a productive forest stand, the stand must have reached at least 40 years of age before being considered an unproductive forest lot or part of a lot.

TITLE II
ELIGIBILITY

CHAPTER I
ELIGIBILITY CONDITIONS

3. A project is eligible for the issuance of offset credits under section 46.8.2 of the Environment Quality Act, for the eligibility period provided for in Chapter II of this Title, if it involves either implementing an afforestation or reforestation activity or implementing a combination of such activities on a single lot or part of a lot and if it meets the following conditions:

(1) the project is implemented by a promoter registered for the cap-and-trade system for greenhouse gas emission allowances in accordance with section 7 or 8 of the Regulation respecting a cap-and-trade system for greenhouse gas emission allowances, if the promoter is domiciled in Québec in the case of a natural person or has an establishment in Québec in other cases;

(2) the GHG withdrawals attributable to the project are realized on the promoter's initiative, without the promoter being required to do so when the project is filed in accordance with Title IV by a law or regulation, an authorization, an order made under a law or regulation, or a court decision.

4. For the purposes of section 3, an afforestation or reforestation project must meet the following conditions

(1)   it is implemented in Québec;

(2)   it is implemented on privately-owned land;

(3)   no credits are received for it for activities under another program to compensate for GHG emissions;

(4)   the promoter has completed an initial characterization for the project in accordance with Chapter II of Title III;

(5)   the project involves no drainage activity as part of the silvicultural strategy;

(6)   when the project includes an afforestation activity, it is carried out on a lot or part of a lot assigned to non-forestry purposes that has not been developed or used for a continuous period of at least 10 years immediately prior to the project;

(7)   when the project includes a reforestation activity, it is carried out on a lot or part of a lot assigned to forestry purposes when the project begins;

(8)   a reforestation project is not eligible when the reforestation is part of a forest producer's forest development plan;

(9)   in an agricultural zone, an afforestation or reforestation project implemented on previously cultivated agricultural land must have received a positive assessment from the Ministère de l'Agriculture, des Pêcheries et de l'Alimentation concerning the potential for agricultural development of the managed area and recommending afforestation or reforestation.

5.   An early project must be filed with the Minister for an analysis of its eligibility not later than 36 months following the date of coming into force of this Regulation.

In other cases, a project must be filed not later than two years following the year in which it begins.

6.   In the case of an early project, only an afforestation activity is eligible as part of an offset credit project pursuant to this Regulation.

CHAPTER II
ELIGIBILITY PERIOD

7. For the purposes of this Regulation, "eligibility period" means the period during which a project remains eligible, subject to compliance with the eligibility conditions in force on the project filing date provided for in Title IV.

8. The eligibility period corresponds to the actual duration of the project and begins on the project start date.

In the case of an early project, the project start date must be before (*insert here the date of coming into force of this Regulation*). It is either

(1) the year in which site preparation work for the planting of seedlings or sowing of seeds began; or

(2) the year in which site the planting of seedlings or sowing of seeds began, if the project involved no site preparation work.

In other cases, the project start date is the year in which the initial inventory began in accordance with Chapter III of Title III, in other words the year in which the survey plan begins on the lot or part of a lot used for the project.

The project end date is the year in which the rotation of the initial stand ends.

CHAPTER III
GENERAL CONDITIONS APPLICABLE TO THE IMPLEMENTATION OF AN ELIGIBLE PROJECT

9. The promoter must send a notice, within 30 days, to inform the Minister if

(1) the promoter terminates a project or aggregation of projects; or

(2) the promoter transfers responsibility for the implementation of a project or aggregation of projects to another person or municipality.

The notice mentioned in the first paragraph must include the following information and documents:

(1)   for the termination of a project or aggregation of projects referred to in subparagraph 1 of the first paragraph:

(a) the date of termination of the project or aggregation of projects;

(b)   the reason for terminating the project or aggregation of projects;

(c)   the project code;

(d)   where applicable, an estimate of the offset credits that will be requested by the promoter for the reporting period during which the termination is planned in accordance with the Regulation respecting a cap-and-trade system for greenhouse gas emission allowances;

(e)   a declaration by the promoter or the promoter's representative that all the information provided is accurate and complete;

(2) for a transfer referred to in subparagraph 2 of the first paragraph:

(a)   the scheduled date of the transfer of the project or aggregation of projects;

(b)   the name of the transferee and all the information needed to identify the transferee, including the number of the general account opened by the Minister for the transferee under section 14 of the Regulation respecting a cap-and-trade system for greenhouse gas emission allowances following the transferee's registration for the cap-and-trade system for emission allowances;

(c)   the project code;

(d)   where applicable, an estimate of the offset credits that will be requested by the promoter and transferee for the reporting period during which the transfer is planned in accordance with the Regulation respecting a cap-and-trade system for greenhouse gas emission allowances;

(e)   a declaration by the promoter and transferee, or their representatives, that all the information provided is accurate and complete.

10.   The promoter must use the forms or templates available on the website of the Ministère du Développement durable, de l'Environnement et des Parcs to submit the information or documents required pursuant to this Regulation.

11.   The promoter must meet a copy of any information and document required to be submitted pursuant to this Regulation for the duration of the project and for a minimum period of 7 years from the project end date.

The information and documents must be legible, dated and revised as needed and be kept in good condition and in a readily accessible place for the duration of the project.

The promoter must also keep any other information and documents required to quantify the GHG withdrawals attributable to the project for the duration of the project and for a minimum period of 7 years following the project end date.

The documents and information referred to in this section must also be provided to the Minister on request.

TITLE III
DEFINITION OF AN ELIGIBLE PROJECT AND QUANTIFICATION APPROACHES

CHAPTER I
PROJECT BOUNDARIES AND GHG FLOWS ATTRIBUTABLE TO THE PROJECT

12.   Tables 1 and 2 below show the carbon reservoirs and the activities and natural processes affecting the content of the reservoirs that must be taken into account by the promoter

(1)   when the initial inventory is conducted in accordance with Chapter III of Title III for the filing of the project with the Minister;

(2)   when the issuance inventory is conducted in accordance with Chapter III of Title III for the filing of an issuance request for offset credits;

(3)   when any other inventory is conducted to update the project.

13. For the purposes of this Regulation,

(1) an annual quantity of carbon cannot contribute beyond a 100-year period following its sequestration to the determination of the number of offset credits to be issued;

(2) the GHG flows associated with the growth of the seedlings planted or seeds sown to replace some or all of the trees from the initial planting of a lot or part of a lot for the project that has been partly or wholly harvested cannot contribute to the project outcome;

(3) GHG flows can only be considered as attributable to an eligible project for the quantification provided for in this Title if they have not already been covered by the issuance of offset credits under the Regulation respecting a cap-and-trade system for greenhouse gas emission allowances or the issuance of credits under another program to compensate for GHG emissions;

(4) in the case of an early project, the promoter may include sequestrations in the project outcome if they are realized after 31 December 1989 but before (*insert here the date of coming into force of this Regulation*).

However, when the issuance of offset credits has already been requested for carbon sequestrations under another program to compensate for GHG emissions, the promoter may include those sequestrations in the project outcome if

(a) when the project is filed with the Minister, the credits for which the promoter intends to consider carbon sequestrations in the project outcome are no longer available to compensate for GHG emissions in the program for which they were issued.

The promoter must cancel the credits and provide proof that they can no longer be used to compensate for GHG emissions under the former program to compensate for GHG emissions if the promoter intends to consider them in the project outcome;

(b) the credits issued, for which the promoter intends to consider carbon sequestrations in the project outcome, must not have been sold or redeemed otherwise than between the person to whom the program to compensate for GHG emissions issued the credits and the promoter of the project implemented pursuant to this Regulation;

(5) for the purposes of this Regulation, in the case of an early project, only the effect of GHG flows on radiative forcing after 31 December 2006 may lead to the issuance of offset credits.

Table 1 – Overview of the approaches used to determine the quantity of carbon present in a project's carbon reservoirs

Carbon reservoir	Approach used to determine the quantity of carbon
Living aerial biomass	The quantity of carbon present in this reservoir is estimated using the measurements made for the initial inventory and the issuance inventory in accordance with Division III of Chapter III of this Title. The information and data from the inventories, which are needed to simulate the annual changes in carbon in the reservoir for the baseline scenario and project scenario, must be entered into the CBM-CFS software.
Living below-ground biomass	The initial quantity of carbon present in this reservoir is estimated using Table 7. The results of the calculations are entered into the CBM-CFS software to simulate carbon changes in the baseline scenario. For the issuance inventory, the quantity of carbon present in this reservoir is determined by the CBM-CFS software based on the information and data used to update the baseline scenario and project scenario.
Dead biomass	The quantity of carbon present in this reservoir is estimated using the measurements made for the initial inventory and the issuance inventory in accordance with Division III of Chapter III of this Title. The information and data from the inventories, which are needed to simulate the annual changes in carbon in the reservoir for the baseline scenario and project scenario, must be entered into the CBM-CFS software.
Soil	The quantity of carbon present in this reservoir is estimated using the measurements made for the initial inventory and the issuance inventory provided for in Division IV of Chapter III of this Title and analyzed in the laboratory in accordance with Schedule C. The information and data from the inventories, which are needed to simulate the annual changes in carbon in the reservoir for the baseline scenario and project scenario, must be entered into the CBM-CFS software. The promoter must include this reservoir in the inventory and quantification when more than 25% of the area of the lot or part of a lot for the project is disturbed by site preparation work to plant seedlings or sow seeds.

Timber forest products	The quantity of carbon present in this reservoir is estimated by the CBM-CFS software using the results from the simulation of annual changes in the carbon contained in the reservoir of merchantable timber in the baseline scenario and project scenario.
	The promoter must enter the results of this estimated into the calculation tool in accordance with Division III of Chapter IV of this Title to determine the effect of processing the volume of timber into timber forest products on radiative forcing.

Table 2 – Overview of the activities and natural processes to be taken into consideration to determine the project outcome

Activity or natural process	GHG	Description
Construction and maintenance work on a network of trails and roads existing at the project start date or to be developed during the project	CO_2	GHG flows associated with the deforestation of a portion of the lot or part of a lot for the project to maintain the network of trails and roads existing at the project start date or to be developed.
		Included only when the project has a leak for a reporting period, in accordance with the chapter VII of this Title.
Site preparation work to plant seedlings or sow seeds (for example, scarifying)	CO_2	GHG flows associated with soil disturbances.
		The promoter must measure the effect of the soil disturbance in accordance with Division IV of this Chapter III and Schedule C. Once the effect of soil disturbance on the carbon reservoir in the soil has been measured, the promoter must enter the result into the CBM-CFS software.
		Included only when more than 25% of the area of the lot or part of a lot for the project is disturbed by site preparation work to plant seedlings or sow seeds.
Spreading of organic or inorganic nitrogenous fertilizer	N_2O	GHG flows associated with the application of organic or inorganic nitrogenous fertilizer.
		The promoter must complete equation 8 and enter the result in the calculation tool.

Plantation release as part of plantation maintenance	CO_2	GHG flows associated with the decomposition of competing biomass. The CBM-CFS software applies the silvicultural strategy entered by the promoter and distributes the carbon flows between reservoirs based on the type of treatment.
Precommercial thinning of the plantation as part of precommercial management work	CO_2	GHG flows associated with the decomposition of the saplings removed. The CBM-CFS software applies the silvicultural strategy entered by the promoter and distributes the carbon flows between reservoirs based on the definition of the treatment.
Partial or total harvest of merchantable volumes of timber for processing	CO_2	GHG flows associated with the harvesting of some or all of the trees in the plantation. The CBM-CFS software applies the silvicultural strategy entered by the promoter and distributes the carbon flows between reservoirs based on the definition of the treatment.
Use of fossil fuels for the purposes of the project	CO_2 CH_4 N_2O	GHG flows associated with the combustion of fossil fuels, in particular gasoline and diesel fuel, for the implementation of the silvicultural strategy associated with the project. The promoter must complete equations 9 and 10 and enter the result in the calculation tool.
Carbon leak	CO_2	GHG flows associated with the deforestation of all deforested areas belonging to the owner of the lot or part of a lot for the project. The promoter must determine if there is a leak by completing equations 11 and 12. In the event of a leak, the promoter must calculate the quantity of carbon returned to the atmosphere for the baseline scenario and project scenario using the CBM-CFS software. Included only when the project has a leak for a reporting period, in accordance with Chapter VII of this Title.

| Timber forest products | CO_2 | GHG flows associated with the transfer of part of the living aerial biomass in timber forest products and their degradation. |
| Forest growth | CO_2 | Flows associated with the transfer of CO_2 from the atmosphere to living biomass in the ecosystem. |

Table 3 – Conversion table to be used to determine the quantity of carbon present in the carbon reservoirs for a project

From	To
1 t anhydrous biomass	0.5 t carbon
1 t carbon	3.667 t CO_2
1 acre	0.4046 ha
1 ha	10 000 m²

CHAPTER II
INITIAL CHARACTERIZATION OF THE PROJECT

14. Before filing a project with the Minister in accordance with Title IV, the promoter must produce an initial characterization for the project

(1) to define the initial context for the project

(a) by identifying the history of land uses on the lot or part of a lot for the project over a period of at least 10 years immediately preceding the project start date;

(b) where applicable, by defining the history of natural disturbances on the lot for the project over a period of at least 10 years immediately preceding the project start date;

(c) where applicable, by defining the history of all forest development activities on the lot for the project over a period of at least 10 years immediately preceding the project start date in order to establish and differentiate between afforestation and reforestation activities;

(d) where applicable, by defining the silvicultural strategy applied prior to the project start date that resulted in the biological characteristics of the strata observed on the lot or part of a lot for the project, including a list of silvicultural treatments, their description and their effects;

(e) where applicable, by defining the site preparation methods applied prior the planting of seedlings or sowing of seeds and the area treated or scheduled for treatment;

(f) by producing one or more maps of the lot for the project with, as a minimum, the following layers:

  i. the outline of the lot for the project and the areas managed for the project;

  ii. the road network;

  iii. the hydrographic network;

  iv. the outline of land assigned to non-forestry purposes, forest stands and adjacent lots;

The geographical entities for the project, such as the outline of each forest stand, must be numbered and described in a table accompanying the map or maps. The table must include, for each entity shown on the map, its number on the map and a summary description (for example, the name of the ecoforest stratum) and its surface area in hectares.

All the maps in the report must have, as the base layer, an aerial photograph or satellite image with a spatial resolution making it possible to distinguish transitions between contrasting geographic entities (for example, between a forest and a road). The resolution of the maps for the project must make it possible to perform a quick analysis of the attributes connected with the project;

(g) by producing two photographs, one of which was taken at least 10 years immediately preceding the start date of the project and the other at a date as close as possible to this date. These photographs must show the boundaries of the lot for the project and the boundaries of adjacent lots.

The photograph must be an interpreted analogical aerial photograph at a scale of 1: 15 000 or better, a digital aerial photograph with a spatial resolution of 30 cm or better, or a satellite image with a spatial resolution of 50 cm or better, in.jpg, .tif or PDF format, and must be accompanied by referencing information and the source of the image in world file format;

(h) a description with the most up-to-date version of a map including a scale, a key, the cardinal points and, where applicable, a cartographic projection showing the land use or the use assigned to the lot or part of a lot for the project and all the lots adjacent to the lot for the project;

(i) in the case of an early project, by determining the context for the forest development practices of the regional agency for private forest development in the region when the project is implemented when the stand was created and the voluntary nature of the action that led to the creation of the stand;

(j) in the case of an afforestation project in an agricultural zone, a summary and a copy of the analysis of agricultural potential for the management area carried out by the Ministère de l'Agriculture, des Pêcheries et de l'Alimentation;

(2) to define the biophysical characteristics observed at the project start date on the or part of a lot for the project and, where applicable, on the equivalent lot, including the definition in the project plan provided for in section 69;

(3) to conduct an initial inventory for the lot or part of a lot for the project and, where applicable, for the equivalent lot using the methodology in Chapter III of this Title;

(4) to determine the initial quantity of carbon present in the carbon reservoirs for the project.

CHAPTER III
INVENTORY

DIVISION I
GENERAL PROVISIONS

15. The aim of the inventory of the lot or part of a lot for the project is to gather the information and data need to create a project and define the baseline scenario and project scenario which, using the CBM-CFS software, will then be used to simulate the annual changes in the carbon stock in accordance with Chapter IV of this Title.

16. Information and data for the inventory of the carbon in living aerial biomass, dead biomass and, where applicable, the soil must be gathered at the following times:

(1)   in the case of an early project, at the same time as the activities needed to ensure completeness at the project filing stage in order to determine the initial quantity of carbon in the reservoirs of the lot or part of a lot for the project and of the equivalent lot and thereby establish the starting point for the simulation of the baseline scenario and project scenario provided for in Chapter IV of this Title; or

(2)   in other cases, before any site preparation work to plant seedlings or sow seeds in order to determine the initial quantity of carbon in the reservoirs of the lot or part of a lot for the project and thereby establish the starting point for the simulation of the baseline scenario and project scenario provided for in Chapter IV of this Title; and

(3)   at the end of each reporting period, within the meaning of section 2, in order to determine annual changes in the quantity of carbon in the reservoirs of the lot or part of a lot used for the project during that period and then to calculate the project outcome as provided for in Chapter VIII of this Title, using data from the report generated by the CBM-CFS software.

17.   All measuring and other equipment used for the inventory of the lot or part of a lot for the project pursuant to this Chapter must be used in accordance with the manufacturer's instructions, be maintained in good working order and work reliably when used.

DIVISION II
SURVEY PLAN

§ 1.–*Determination of the required number of sample plots*

18.   The number of sample plots in a sampling stratum must allow the achievement of an inventory data precision rate of at least 90% and a confidence level of 90%. (α = 10%).

The number of sample plots is calculated using equations 1 to 5:

Equation 1

$$E\% = \frac{100(t_{1-\frac{\alpha}{2};n-1} * \sqrt{s^2}}{\bar{x}}$$

Where:

E% = Relative error of the sampling stratum;

$t_{1-\frac{\alpha}{2};n-1}$= Student T value with n-1 degrees of freedom being > 30 with a confidence level of 90%;

α = 10%;

s^2= Weighted variance, calculated using equation 2;

$\bar{x}$= Weighted average of strata, calculated using equation 5.

Equation 2

$$s^2 = \sum_{i=1}^{h} \frac{P_i^2 s_i^2}{n_i}$$

Where:

s² = Weighted variance;

i = Stratum number;

h = Total number of strata;

P_i = Proportion of stratum i compared to the total area;

s_i^2 = Variance of the stratum;

n_i= Total number of sample plots in stratum i, calculated using equation 3.

Equation 3

$$n = \left(\frac{t_{1-\alpha;n-1} * CV}{E_{tol}\%}\right)^2$$

Where:

n = Total number of sample plots;

$t_{1-\frac{\alpha}{2};n-1}$ = Student T value with a significance level of α = 10% and $_{n-1}$ degrees of freedom used for the pre-sampling;

CV = Coefficient of variation corresponding to a measurement of relative dispersion that is the standard deviation for the distribution expressed as a percentage of the average dispersion, calculated using equation 4;

$E_{tol}\%$ = Relative error tolerated (10%).

Equation 4

$$CV = \frac{s}{\bar{x}}$$

Where:

CV = Coefficient of variation corresponding to a measurement of relative dispersion that is the standard deviation for the distribution expressed as a percentage of the average dispersion;

s = Weighted standard deviation from the pre-sampling;

$\bar{x}$ = Weighted average of the pre-sampling.

Equation 5

$$\bar{x} = \sum_{i=1}^{h} P_i \bar{x}_i$$

Where:

$\bar{x}$ = Weighted average of all strata;

i = Stratum number;

h = Total number of strata;

P_i = Proportion of the area of stratum i compared to the total area;

$\bar{x}_i$ = Average of stratum i.

19.   When the relative error for a stratum is greater than 10%, the number of sample plots required is the difference between the number of pre-sampled sample plots and the result obtained using equation 3.

§ 2.–*Layout of sample plots*

20.   The sample plots must be laid out as shown in the diagram in Schedule A.

21.   The promoter must establish a network of sample plots for the inventory as follows:

(1)   for the initial inventory for an early project, the promoter must establish a network of temporary sample plots on the equivalent lot for the project and a network of permanent sample plots on the lot or part of a lot for the project;

(2)   for the initial inventory for other types of projects, the promoter must establish a network of temporary sample plots on the lot or part of a lot for the project when a site preparation treatment is applied before the planting of seedlings or sowing of seeds;

(3)   for an issuance or update inventory, the promoter must establish a network of permanent sample plots on the lot or part of a lot for the project.

22.   To establish a network of temporary sample plots, the promoter must identify the centre of variable-radius plots and listed micro-plots using a non-permanent peg and label.

To establish any other network of sample plots, the promoter must identify the centre of variable-radius plots and listed micro-plots using a permanent peg and label.

In all cases, the label must indicate the number of the sample route and sample plot, the date and the name of the person responsible for gathering data from each variable-radius plot and micro-plot.

Where applicable, the promoter must also identify the places where a soil sample was taken in micro-plots 4 and 6 of each sample plot with, depending on whether the first or second paragraph applies, a permanent or non-permanent peg and label. In addition to the information listed in the preceding paragraph, the peg must indicate the number of the soil sample.

DIVISION III
INVENTORY OF LIVING AERIAL BIOMASS AND DEAD BIOMASS

§ 1.–*General provisions*

23.   The promoter may limit measurements to those needed to estimate the merchantable volume of trees in the plantation, snags and woody debris during the initial inventory of the lot or part of a lot for an early project.

§ 2.–*Data gathering*

24.   Data gathering for an inventory of the carbon reservoirs of living aerial biomass and dead biomass must comply with the procedure set out in Tables 4, 5 and 6.

Table 4 – Variables to be measured for the inventory of carbon reservoirs of living aerial biomass

Variable	When measured	Data gathered	Threshold to be respected for data gathering	Data acquisition method
Regeneration	Initial inventory	Distribution coefficient Species	Height > 30 cm	<u>Field inventory</u> Groups of sample plots
Trees	Initial inventory Issuance inventory	Species Number DBH class (2 cm classes) Height Basal area	Height > 1.3 m DBH (1.3 m) DSH (15 cm from ground)	<u>Field inventory</u> Variable-radius plot Biomass Shrub: Schedule B
Shrubs	Initial inventory	Number DSH class, Species	Height > 1.3 m DSH (15 cm from ground) (2 cm class)	<u>Field inventory</u> Groups of sample plots Biomass Shrub: Schedule B
Grasses, mosses, seedlings and shrubs of less than 1.3 m	Initial inventory	Cover class (0-25%, 25-50%, 50-75%, 75-100%) – all heights combined	Height < 1.3 m Height < 50 cm by 25 cm class	<u>Field inventory</u> Groups of plots <u>Default value for 100% cover</u> 7.5 tonnes anhydrous biomass/ha To be multiplied by actual herbaceous cover (ha)

Table 5 – Variables to be measured for the inventory of carbon reservoirs of dead biomass

Variable	When measured	Data gathered	Threshold to be respected for data gathering	Data acquisition method
Woody debris and snags	Initial inventory Issuance inventory	Species Number Snags: DBH Woody debris: average diameter; length Decomposition class At the initial inventory, snags must be marked but not measured At the issuance inventory, only unmarked snags and woody debris must be measured	Height > 1.3 m	<u>Field inventory</u> Variable-radius plot to measure snags caught by the prism Decomposition class: 1. Tree that died recently with twigs but without needles/leaves 2. Tree without twigs but with branches 3. Tree with large branches only 4. Snag without branches Woody debris: measurement taken within the variable-radius plot delimited by the last tree caught by the prism

Table 6 – DBH classes for the inventory of carbon reservoirs of living aerial biomass and dead biomass

DBH class	DBH value
2	$1 < DBH \leqslant 3$ cm
4	$3 < DBH \leqslant 5$ cm
6	$5 < DBH \leqslant 7$ cm
8	$7 < DBH \leqslant 9$ cm
10	$9 < DBH \leqslant 11$ cm
…	$… < DBH \leqslant …$ cm

§ 3.—*Estimate of living below-ground biomass for the initial inventory*

25. The promoter must estimate the initial quantity of living below-ground biomass using data from the initial inventory of living aerial biomass and the equations in Table 7 below. The promoter must enter this information and data into the CBM-CFS software.

Table 7 – Information used to estimate living below-ground biomass during the initial inventory

Variable	Method used to estimate the initial quantity of biomass
Tree roots	Calculation Softwoods: Root biomass = 0.222 x tree biomass obtained following compilation of the initial inventory Hardwoods: Root carbon biomass = 1.576 + 0.615 x tree biomass obtained following compilation of the initial inventory
Shrub roots	Calculation Shrubs: root biomass =1.5750 + 0.615 x shrub biomass obtained following compilation of the initial inventory
Grass roots	Default value for 100% cover 15.0 tonnes biomass/ha To be multiplied by the actual herbaceous cover (ha) obtained during the initial inventory

DIVISION IV
SOIL CARBON INVENTORY

§ 1.—*General provisions*

26. A soil carbon inventory of the lot or part of a lot for the project must be conducted during the initial inventory and the issuance inventory when more than 25% of the lot or part of a lot is disturbed by site preparation work to plant seedlings or sow seeds.

§ 2.–*Data collection*

27.   Soil sampling must be conducted as follows:

(1)   three successive samples of around 10 cm, including surface litter (LFH horizon), must be taken to a depth of about 30 cm around micro-plots 4 and 6 of the plan in Schedule A;

(2)   once a sample has been taken and before the next sample is taken, the promoter must measure the depth of the hole to the nearest 0.25 cm, to ascertain the depth of the soil taken for each of the three samples;

(3)   the samples must be taken using a volumetric probe with a diameter of at least 5 cm for quantitative sampling. When it is impossible to take a volumetric sample, the soil samples must be taken using a Dutch auger;

(4)   the colour of each soil sample must be determined using a Munsell soil colour chart. The promoter must, in particular, enter the route number and sample plot number, the sample number and the soil colour code in the compiled inventory report for the project;

(5)   the distance between two samples taken during different sampling campaigns must be at least 1 m.

28.   The steps in the soil sampling process and the associated variables used to calculate the quantity of soil carbon in the laboratory are described in the table in Division I of Schedule C.

§ 3.–*Analysis of soil samples*

29.   All the soil samples taken must undergo combustion analysis at a laboratory accredited pursuant to section 118.6 of the Environment Quality Act (chapter Q-2) or, if no laboratory is accredited for sample analysis, by a laboratory that is compliant with ISO/CEI 17025, "General requirements for the competence of testing and calibration laboratories" distributed jointly by the International Organization for Standardization and the International Electrotechnical Commission.

30.   When analyzing the samples, the laboratory must follow the steps presented in the table in Division II of Schedule C. It must also follow the steps for the analysis of variables used to calculate soil carbon set out in Division III of Schedule C.

CHAPTER IV
SIMULATION OF THE ANNUAL CHANGE IN CARBON STOCK IN THE CARBON RESERVOIRS FOR A PROJECT

DIVISION I
GENERAL CONDITIONS

31. The annual change in carbon stock in the carbon reservoirs for a project must be simulated for the baseline scenario and project scenario using the most recent updated version of the CBM-CFS software and the calculation tool.

The simulation must be consistent with the information and data collected and compiled at the various project stages.

32. The simulation of the annual change in carbon stock in the carbon reservoirs for a project must make it possible to

(1) define and compare the annual change in the carbon stock under the baseline scenario and the project scenario;

(2) produce the data needed to establish the number of offset credits to be issued pursuant to the Regulation respecting a cap-and-trade system for greenhouse gas emission allowances.

33. The simulation of the baseline scenario and project scenario must

(1) when the project is filed, cover a period of at least 100 years from the data collection data for the initial inventory;

(2) at the end of each reporting period, be updated for a simulation period of at least 100 years.

34. When a natural or man-made disturbance occurs during a reporting period, the promoter must

(1) include the effect of the disturbance in the project scenario;

(2) include the effect of the disturbance in the baseline scenario only when it could have occurred if the project had not existed.

The effect of the disturbance must be included in a scenario either during the year in which it occurs or at the end of a reporting period.

35. The baseline scenario for a project cannot be amended after the project's eligibility has been confirmed by the Minister, except in the case of an update needed to include the effect of a natural disturbance mentioned in section 34.

36. The promoter cannot amend the information and data entered into the CBM-CFS software and the calculation tool if they have been used to apply for the issuance of offset credits when including a natural or man-made disturbance or performing an update at the end of a reporting period in the project scenario and, where applicable, in the baseline scenario.

37. The promoter must keep a register of the amendments made to the definition of the baseline scenario and project scenario, including in particular a summary description of the main amendments made to the information and data entered into the CBM-CFS software and the calculation tool for the initial characterization and the updating of the baseline scenario and project scenario.

The information in the register must be kept for a minimum period of 7 years from the project end date and be made accessible, for consultation, by the persons responsible for verifying the project.

DIVISION II
GROWTH CURVE

§ 1.—*Selection of the growth curve for merchantable volume in the baseline scenario*

38. To simulate the baseline scenario, the promoter must

(1) for an afforestation project on a lot or part of a lot assigned to non-forestry purposes, select a growth curve representing the annual change in the merchantable volume of each stratum in the baseline scenario from among those shown in the tables in Division II of Schedule D;

(2) for a reforestation project on a lot or part of a lot assigned to forestry purposes or on a lot or part of a lot assigned to non-forestry purposes, generate or select a growth curve from a growth model for each stratum in the baseline scenario.

The growth curve generated or selected must be representative of the effects of land uses and layouts and the effects of the biophysical characteristics of the lot or part of a lot for the project.

§ 2.—*Selection of the growth curve for merchantable volume in the project scenario*

39. To simulate the project scenario, the promoter must generate or select a growth from a growth model for each stratum in the project scenario.

The growth curve generated or selected must be representative of the effects of land uses and layouts and the effects of the biophysical characteristics of the lot or part of a lot for the project.

§ 3.—*Method used to define the age of the strata in the baseline scenario and project scenario*

40. To position the initial total anhydrous biomass on the growth curve for the baseline scenario, the anhydrous biomass in each plant stratum must be converted into merchantable volume using the information in Schedule E.

41. The age of each stratum in the baseline scenario and project scenario must be defined

(1) in the case of the baseline scenario for a lot or part of a lot assigned to non-forestry purposes, based on the merchantable volume calculated in accordance with section 40 in relation to the growth curve selected to represent the change in the merchantable volume for a stratum; or

(2) in the case of the baseline scenario for a lot or part of a lot assigned to forestry purposes, based on the measurements of dominant height, basal area and number of stems in relation to the growth curve selected to represent the change in the merchantable volume for a stratum; and

(3) in the case of the project scenario, based on the year of the planting of seedlings or sowing of seeds.

42. The promoter must ensure that the measures implemented on the lot or part of a lot for the project are consistent with the age-volume relationship for the selected growth curve. The promoted must also adjust the growth curve if any inconsistency is observed.

DIVISION III
TIMBER FOREST PRODUCTS

43. When the baseline scenario and project scenario are simulated, the promoter must enter into the CBM-CFS software the actual or, if not, the estimated percentage of the volume of timber harvested that will be processed into timber forest products during a reporting period.

The percentage must be determined taking into account the information and data gathered during inventories before and after the treatment and when all stems in the 10 cm and over diameter class are measured.

44. The promoter must enter into the calculation tool the data generated by the CBM-CFS software concerning the reservoir in the merchantable volume.

45. The calculation tool defines the quantity of carbon contained in timber forest products by applying the distribution rate by product and the half-life for timber forest products shown in Division I of Schedule F to the results.

The promoter may use a distribution rate by product that is different from the default in the calculation tool.

46. The carbon stock contained in timber forest products is calculated by the calculation tool using equation 6:

Equation 6

$$C(t+1) = e^{-k} \times C(t) + \frac{1 - e^{-k}}{k} \times I(t)$$

Where:

$C_{(t+1)}$ = Residual fraction of a quantity of carbon sequestered in a type of timber forest product;

t = Year after processing;

e = Napier's constant = 2.71828;

k = Constant annual rate at which the quantity of timber forest products degrades and completes its lifecycle. $k = \ln(2)/t1/2$ where $t1/2$ is the half-life of a timber product for a specific final use;

The value of variables k and e^{-k} to predict the annual change in the quantity of a product category over time is determined in Division II of Schedule F;

C(t) = Quantity of carbon harvested and processed into timber forest products at the start of year t. The product of C(t) and e^{-k} describes the carbon retained in timber products from year t to year t+1;

$I_{(t)}$ = Accumulation of timber products (in mass of carbon) at time t from new harvesting or recycled timber products. The product of the equation corresponds to the carbon contained in $I_{(t)}$ maintained as a timber product at the end of year t after decomposition. The value is determined using the provincial distribution rate table in Division I of Schedule F, except where the promoter provides a different distribution rate as provided for in the second paragraph of section 45.

DIVISION IV
SPECIAL PROVISIONS FOR THE SIMULATION OF THE ANNUAL CHANGE IN CARBON STOCK IN THE CARBON RESERVOIRS FOR AN EARLY PROJECT

§ 1.—*General conditions*

47.   The following provisions apply to an early project, in addition to the requirements set out in Divisions I to III of this Chapter that apply to all projects.

48.   When an early project is filed, the simulation of the annual change in carbon stock in the baseline scenario and project scenario carried out from data collected during the initial inventory of the equivalent lot or part of a lot must include

(1)   a reconstitution period for the annual change in the carbon stock for the project between the year in which the project began and the year in which it is filed;

(2)   a period representing the annual change in the carbon stock for the project over 100 years following the year of filing.

§ 2.—*Conditions applicable to the baseline scenario concerning the initial state of the carbon reservoirs, except the soil reservoir*

49.   The promoter must determine the initial state of the carbon reservoirs, except the soil reservoir, using the data gathered during the initial inventory, on the basis of an equivalent lot or part of a lot.

50.   The equivalent lot or part of a lot must be selected using a comparative photo-interpretation analysis, which must

(1)   for the lot or part of a lot for the project, be based on an analogical or digital aerial photograph or a satellite image showing it before the implementation of the project. The photograph or image must be taken at a date as close as possible to the year of planting of seedlings or the sowing of seeds;

(2)   for the equivalent lot or part of a lot, be based on an analogical or digital aerial photograph or a satellite image showing the land to be inventoried. The photograph or image must be taken at a date as close as possible to the year in which the comparative photo-interpretation analysis takes place;

(3)   define the category of fallow land and the characteristics of the plant strata, in particular the types of species present, their density class and average height on the lot or part of a lot for the project;

(4)   show that there is no statistically significant difference between the lot or part of a lot for the project and the equivalent lot or part of a lot with respect to the category of fallow land, within the meaning of this Regulation, and the characteristics of the interpretation strata for the analogical or digital aerial photographs or satellite images compared.

For the purposes of subparagraph 4 of the first paragraph of this section, a difference is "statistically significant" when the value obtained by a chi-squared test is below 0.05.

§ 3.—*Conditions applicable to the baseline scenario and project scenario concerning the initial state of the soil carbon reservoir*

51.   The initial quantity of the carbon stock in the soil carbon reservoir is determined using equation 7. The result of the equation must be entered into the CBM-CFS software for the simulation of the baseline scenario and project scenario.

Equation 7

$$C_{SoilRef} = \left(\left(30 - age_{plant}\right) \times 0{,}0167 + 1 \right) \times tC_{soilDP/ha}$$

Where:

$C_{SoilRef}$ = Quantity of carbon present in the soil at the start date of an early project;

30 = Number of years needed to stabilize the carbon following site preparation work;

age_{plant} = Age of the plantation at the project filing date;

0.0167 = Annual rate of carbon accumulation in the soil following site preparation work;

1 = Constant;

$tC_{soilDP/ha}$ = Quantity of carbon in the soil carbon reservoir determined using the compiled value of the quantity of carbon obtained following the analysis of soil samples taken during the initial inventory of the lot or part of a lot for the project.

§ 3.–*Conditions applicable to the project scenario*

52. The promoter must determine the initial state of the carbon reservoirs in the project scenario for an early project using the data gathered during the initial inventory on the lot or part of a lot for the project.

53. For the reconstituted portion of the growth curve of merchantable volume in the project scenario, the annual change in the carbon stock in all the carbon reservoirs for the project must be simulated using the information and data gathered during the initial inventory of the lot or part of a lot for the project.

CHAPTER V
CALCULATION OF DIRECT EMISSIONS OF NITROUS OXIDE ATTRIBUTABLE TO THE FERTILIZATION OF THE LOT OR PART OF A LOT FOR THE PROJECT

54. The promoter must calculate the direct emissions of nitrous oxide attributable to the spreading of organic and inorganic nitrogenous fertilizer on the lot or part of a lot for the project at the end of a reporting period using equation 8 to ensure that the result of the calculation is entered into the most recent updated version of the calculation tool:

Equation 8

$$N_2O_{Spreading_i} = (N_{FERTi} \times EC_{BASE}) \times \frac{44}{28}$$

Where:

$N_2O_{Spreading_i}$ = Emissions from the spreading of nitrogenous fertilizer of type i (kg N$_2$O/year);

i = Type of organic or inorganic nitrogenous fertilizer (synthetic fertilizer, manure, slurry or sludge from a paper mill, de-inking mill or sewage works);

N_{FERTi} = Quantity of nitrogen from nitrogenous fertilizer of type i, *kg N spread* (kg N$_2$O/year);

EC_{BASE} = Base emission coefficient = 0.0168 kg N$_2$O-N/kg N;

$\frac{44}{28}$ = Conversion coefficient, N-N$_2$O to N$_2$O.

CHAPTER VI
CALCULATION OF DIRECT CARBON DIOXIDE EMISSIONS ATTRIBUTABLE TO THE USE OF FOSSIL FUELS

55. These GHG flows must be taken into account at the end of a reporting period to ensure that the result of the calculation is entered into the most recent updated version of the calculation tool and considered in the project outcome.

56. The promoter must calculate the direct GHG emissions attributable to the implementation of a silvicultural strategy on the lot or part of a lot for the project using the following equation:

Equation 9

$$FFE = \sum [FF_c \times [(EF_{CO2,c} \times 10^{-3}) + (EF_{CH4,c} \times GWP_{CH4} \times 10^{-6}) + (EF_{N2O,c} \times GWP_{N2O} \times 10^{-6})]]$$

Where:

FFE = Total GHG emissions attributable to the consumption of fossil fuels, in metric tonnes CO_2 equivalent;

c = Type of fossil fuel, gasoline (regular or premium) or diesel;

FF_c = Total quantity of fossil fuel c consumed, in litres;

$EF_{CO2,c}$ = CO2 emission factor for fossil fuel *c* as set out in Table 27-1 of Schedule A.2 QC.27.7 of the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere (chapter Q-2, r. 15), in kilograms of CO2 per litre;

10^{-3} = Conversion factor, grams to metric tonnes;

$EF_{CH4,c}$ = CH4 emission factor for fossil fuel *c* as set out in Table 27-1 of Schedule A.2 QC.27.7 of the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere, in grams of CH_4 per litre;

GWP_{CH4} = Global warming potential of CH_4, taken from Schedule A.1 of the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere;

10^{-6} = Conversion factor, grams to metric tonnes;

$EF_{N2O,c}$ = N2O emission factor for fossil fuel *c* as set out in Table 27-1 of Schedule A.2 QC.27.7 of the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere, in grams of N_2O per litre;

GWP_{N2O} = Global warming potential of CH_4, taken from Schedule A.1 of the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere;

57. The promoter must calculate the quantity of fossil fuels consumed, using the following equation:

Equation 10

$$FF_c = \sum CF_c \; x \; Surface \; area$$

Where:

FF_c = Total volume of fossil fuel of type *c* used during a reporting period, in litres;

c = Type of fossil fuel, either gasoline or diesel;

y = Number of treatment families;

t = Treatment family in accordance with Schedule H;

CF_c = Consumption factor for fossil fuel of type *c* as set out in the table in Schedule H, in litres/ha;

Surface area = Total surface area on which a treatment family is applied, in ha.

CHAPTER VII
CARBON LEAKS

58. The promoter must determine if a leak has been generated by the project at the end of a reporting period.

59. A carbon leak is generated by a project when, during a reporting period, the deforestation rate for all the lots and parts of lots belonging to the owner of the lot or part of a lot for the project, obtained using equation 11, is greater than the deforestation rate for private land in the municipality where the project is implemented at the end of a reporting period, obtained using equation 12.

60. At the start of each reporting period, the promoter must define the surface area of all privately-owned lots or parts of lots assigned to forestry purposes in the municipality where the project is implemented.

The promoter must indicate the result in the project plan and, if applicable, in the project report and indicate the sources and approach used to quantify the result.

61. When a carbon leak is generated during a reporting period, the promoter must quantify, into the CBM-CFS software, the effect of deforestation of all deforested area on the carbon reservoirs of the project of the lots belonging to the owner of the lot or part of a lot for the project. He must integrate this result into the project report.

62. When it is impossible to establish the deforestation rate for private land in the municipality where the project is implemented at the end of a given reporting period using equation 12, the minimum deforestation rate for the lots belonging to the owner of the lot or part of a lot that is applicable to an issuance period is 2%.

Equation 11

$$R_p = \frac{(Aps - Ape)}{Aps} * 100$$

Where:

R_p = Deforestation rate for lots belonging to the owner of the lot or part of a lot for the project;

Aps = At the start of a reporting period, total surface areas of lots or parts of lots assigned to forestry purposes that are located on lots or parts of lots belonging to the owner of the lot or part of a lot for the project implemented pursuant to this Regulation;

Ape = At the end of a reporting period, total surface areas of the lots or parts of lots assigned to forestry purposes that are located on lots or parts of lots belonging to the owner of the lot or part of a lot for the project implemented pursuant to this Regulation.

Equation 12

$$R_{m=\frac{(Ams-Ame)}{Ams}*100}$$

Where:

R_m = Deforestation rate for private land in the municipality where the project is implemented at the end of a given reporting period;

Ams = At the start of a reporting period, surface area of the lots or parts of lots assigned to forestry purposes on private land in the municipality where the project is implemented pursuant to this Regulation;

Ame = At the end of a reporting period, surface area of the lots or parts of lots assigned to forestry purposes on private land in the municipality where the project is implemented pursuant to this Regulation.

CHAPTER VIII
PROJECT OUTCOME

63.   The promoter must enter into the most recent updated version of the calculation tool the information and data obtained pursuant to Title III to determine the project outcome.

64.   For an update to the project outcome and an issuance request, the promoter must keep the data obtained pursuant to Title III and entered into the calculation tool that are covered by the issuance request. In addition, the promoter may not modify the data at a later date.

65.   The project outcome is determined by the calculation tool by subtracting the results for the project scenario obtained using equations 13 to 18 below from the results for the baseline scenario obtained using the same equations:

Equation 13

$$BER_{co2eq}(k \rightarrow l) = RE_S CO_2(k \rightarrow l) + RE_{\ E}GHG(k \rightarrow l)$$

Where:

$BER_{co2eq}(k{\rightarrow}l)$ = Net effect of GHG flows based on radiative forcing during a reporting period ($k{\rightarrow}l$) in metric tonnes CO_2 equivalent;

$RE_sCO_2(k{\rightarrow}l)$ = Residual effect of CO_2 captured during a reporting period ($k{\rightarrow}l$) (negative value), calculated using equation 14;

$RE_EGHG(k{\rightarrow}l)$ = Residual effect of GHG emitted during a reporting period ($k{\rightarrow}$) (positive value), calculated using equation 16;

k = Start of reporting period;

l = End of reporting period.

Equation 14

$$RE_s CO_2(k \rightarrow l) = \sum_{j=k}^{l} \left(m_S CO_2\,(j) \right) * \left(F_S(j)_{k \rightarrow l} \right)$$

Where:

$REsCO_2(k{\rightarrow}l)$ = Residual effect of CO_2 captured during a reporting period on radiative forcing ($k{\rightarrow}l$);

m_s = Mass of CO_2 captured during a reporting period;

$Fs(j)_{k{\rightarrow}l}$= Fraction of the sequestration effect of one tonne of CO_2 on radiative forcing during a reporting period from k to l ($k{\rightarrow}l$) calculated using equation 15;

j = Year of carbon sequestration, by default the year begins at 0 with the planting of seedlings or sowing of seeds;

k = Start of reporting period;

l = End of reporting period.

Equation 15

$$F_S(j)_{k \to l} = \frac{\int_{t=k-j \, ou \, t=0}^{l-j} a_{co_2} * C_{co_2}(t)dt}{\int_{t=0}^{100} a_{co_2} * C_{co_2}(t)dt}$$

Where:

$Fs(j)_{k \to l}$ = Fraction of the sequestration effect of one tonne of CO_2 on radiative forcing during a reporting period from k to l ($k \to l$);

a_{co2} = Instantaneous radiative forcing by unit mass of a CO_2 flow present in the atmosphere, the value of variable a_{co2} being 5.35 W m^{-2} kg^{-1};

$C_{co2}(t)$ = Atmospheric mass loading of a CO_2-type GHG or residual fraction of a type x GHG flow as a function of period t;

j = Year of carbon sequestration, by default the year begins at 0 with the planting of seedlings or sowing of seeds;

k = Start of reporting period;

l = End of reporting period;

t = Period of time from the start of the GHG flow to the end of the reporting period (sequestration) or 100 years (emission).

Equation 16

$$ER_E GES(k \to l) = \sum_{j=k}^{l} \left(m_E GES(j) \right) * (F_E(j))_{k \to l}$$

Where:

RE$_E$GHG(k→l)= Residual effect of GHG emitted during a reporting period (k→l) (positive value);

$m_{EGES(j)}$ = Mass of GHG emitted during year j in metric tonnes;

F$_E$(j)$_{k \to l}$ = Fraction of the effect of the emission of one tonne of GHG of type *x* on radiative forcing during a reporting period from k to l (k→l) calculated using equation 17;

j = Year of carbon sequestration. By default, the year begins at 0 with the planting of seedlings or sowing of seeds;

k = Start of reporting period;

l = End of reporting period.

Equation 17

$$F_E(j)_{k \to l} = \frac{\int_{t=k-j \ ou \ t=0}^{l-j} a_{GHG} * C_{GHG}(t)dt}{\int_{t=0}^{100} a_{CO_2} * C_{CO_2}(t)dt}$$

Where:

F$_E$ (j)$_{k \to l}$ = Fraction of the effect of the emission of one tonne of GHG of type x on radiative forcing during a reporting period from k to l (k→ l);

a_x = Instantaneous radiative forcing by unit mass of GHG of type x (here x= CO_2) present in the atmosphere, the value of variable a_{co2} being 5.35 W m^{-2} kg^{-1};

$C_{GHG}t$) = Atmospheric mass loading of a GHG at time t of type x or residual fraction of a type x GHG flow as a function of period of time t;

$C_{co2}(t)$ = Atmospheric mass loading of a GHG at time t of type CO_2 or residual fraction of a CO_2 type GHG flow as a function of period t, calculated using equation 18;

j = Year of CO_2 sequestration, by default, the year begins at 0 with the planting of seedlings or sowing of seeds;

k = Start of reporting period;

l = End of reporting period;

t = Period of time from the start of the GHG flow to the end of the reporting period (sequestration) or 100 years (emission).

Equation 18

$$C_{CO_2}(t) = k_{CO_2} \int_{-\infty}^{t} E_{CO_2}(t') \cdot \left[f_{CO2,0} + \sum_{S=1}^{n} f_{CO2,S} \cdot e^{\left(-\frac{t-t'}{\tau_{CO2,S}}\right)} \right]_F dt'$$

Where:

$C_{co2}(t)$ = Atmospheric mass loading of a CO_2-type GHG or residual fraction of a type x GHG flow as a function of period t;

r = concentration;

k_{CO2} = 0.47 ppmv/GtC, to be added only to adjust the result;

E_{CO2} = Emissions of CO_2 in metric tonnes;

$\tau_{CO2,S}$= Exponential atmospheric degradation time of the Sth fraction of the additional concentration (т1 = 394.4; т2 = 36.54; т3 = 4.304);

$f_{CO2,0}$= First fraction (0.2173);

$f_{CO2,S}$= Respective fractions (0.224; 0.2824; 0.2763).

TITLE IV
PROJECT FILING

CHAPTER I
GENERAL PROVISIONS

66.   A promoter must file a project with the Minister after completing the initial stages such as the initial characterization, the initial inventory and the simulation within the time limits set in section 5.

The filing of a project involves the simultaneous transmission of the project notice provided for in Chapter II of this Title, the project plan provided for in Chapter III of this Title and the verification report on the project plan provided for in Chapter III of Title VII.

67.   Within 90 days of receiving a complete project the Minister, in a written communication with the promoter, confirms or rejects

(1)   the project's eligibility, in accordance with the eligibility conditions set out in Chapter I of Title II;

(2)   the validity of the initial inventory and the baseline scenario.

When a project's eligibility is confirmed by the Minister, a project code is assigned and forwarded to the promoter.

CHAPTER II
PROJECT NOTICE

68.   The project notice includes, in particular, the following information and documents:

(1)   the information needed to identify the promoter and the promoter's representative, if any;

(2)   the number of the general account opened by the Minister for the promoter under section 14 of the Regulation respecting a cap-and-trade system for greenhouse gas emission allowances following the promoter's registration for the cap-and-trade system for emission allowances;

(3)   the date of the project notice;

(4)   information relating to the location of the project, including the regional county municipality, the municipality, the cadastral designation and, where applicable, the street address of the lot;

(5)   a brief description of the project including, in particular, the following information:

(a)   the project type, whether an afforestation project, a reforestation project, or both;

(b)   whether or not the project is an early project;

(c)   whether or not the project is part of an aggregation and, if so, the name of the aggregation;

(d)   the total surface area of the lot for the project;

(e) the surface area of the lot affected by an afforestation activity, the surface area affected by a reforestation activity and, where applicable, the cumulative area affected when the project involves both types of activity;

(f) the project start date when known or, when not known, an estimate;

(g) the estimated duration of the project;

(h) the estimated start and end dates of the reporting periods for the entire estimated duration of the project;

(i) an estimate of the number of offset credits to be issued for each reporting period and the total number of offset credits for the entire duration of the project;

(6) the information needed to identify the owner of the lot or part of a lot for the project and the relevant information if it belongs to the promoter;

(7) a declaration by the promoter or the promoter's representative that the information and documents provided are accurate.

CHAPTER III
PROJECT PLAN

69. The project plan must include, in particular, the following information and documents:

(1) the information needed to identify the promoter and the promoter's representative, if any;

(2) when the promoter has engaged, or expects to engage, the services of a professional or another person to prepare or implement the project,

(a) the information needed to identify that professional or person;

(b)   a summary of the tasks that will be assigned to that professional or person;

(c)   where applicable, a declaration by the professional or person that the information and documents provided are complete and accurate;

(3)   the date of the project plan;

(4)   an exhaustive description of the project including, in particular, the following information:

(a)   the project type, whether an afforestation project, a reforestation project, or both;

(b)   whether or not the project is an early project;

(c)   whether or not the project is part of an aggregation and, if so, the name of the aggregation;

(d)   the project objectives in terms of carbon offset and forest development;

(e)   the total surface area of the lot for the project including the area assigned to forestry purposes and the area assigned to non-forestry purposes.

(f)   the surface area of the lot affected by an afforestation activity, the surface area affected by a reforestation activity and, where applicable, the cumulative area affected when the project involves both types of activity;

(g)   the project start date when known or, when not known, an estimate including an indication of how the estimate was determined;

(h)   the estimated duration of the project;

(i)   the estimated start and end dates of the reporting periods for the entire estimated duration of the project;

(j)   the information needed to identify the owner of the lot or part of a lot for the project and the relevant information if it belongs to the promoter;

(k)   where applicable, information on the owner's registration as a forest producer associated with the project, if the owner is not the promoter, and the owner's forest producer number;

(5)   a demonstration that the project meets the eligibility conditions set out in Chapter I of Title II, including a copy of any relevant document.

(6)   information on the initial characterization for the project, including the elements listed in section 14, their justification and a presentation of the initial inventory for the lot or part of a lot for the project, including all relevant elements and their justification;

(7)   where applicable, a copy of the report on soil sample analyses for the project prepared by the laboratory responsible for analyzing the samples;

(8)   a presentation of the baseline scenario and project scenario and the results from the simulation of annual change in the carbon stock including all relevant information and its justification;

(9)   a presentation of the project outcome including all relevant information and its justification;

(10)   a copy of the files for the project generated by the CBM-CFS software to simulate the annual change in carbon in the carbon reservoirs under the baseline scenario and project scenario;

(11)   a copy of the calculation tool used to define the project outcome including all the data and hypotheses used to simulate the baseline scenario and project scenario, the planned issuance periods and the total number of offset credits to be issued for the project and for each estimated issuance period;

(12)   a declaration signed by the promoter or the promoter's representative stating that no offset credits have been issued for the GHG withdrawals targeted by the project plan under the Regulation respecting a cap-and-trade system for greenhouse gas emission allowances and that no credits have been issued under another program to offset GHG emissions or will be issued under such a program;

(13)   in addition to the requirements set out in this section, in the case of an early project, the promoter must also provide the information needed to identify the early project as registered for another program to offset GHG emissions including, in particular, the information needed to identify the program. In addition, a promoter who wishes to consider, in the project outcome, GHG withdrawals for which offset credits have been issued under another program to offset GHG emissions must provide the following information:

(a)   the start date of the project, as defined in this regulation, and the date of its registration in the program to offset GHG emissions;

(b)   the total number of credits issued, by vintage;

(c)   the total number of credits issued, by vintage, and the number of GHG withdrawals in tCO2 that will be considered in the project outcome when the project is filed and when applications for issuance are made;

(d)   the information needed to identify the credits for which the promoter wishes to consider GHG withdrawals in the project outcome, including the serial number or equivalent and the vintage;

(14)   in the case of an early project, when credits have been issued for the GHG withdrawals considered in the project outcome under another program to offset GHG emissions, the promoter must show that

(a)   the credits issued to the promoter of the original project and the related GHG withdrawals taken into account in the project outcome have never been used to offset a GHG emission under another program to offset GHG emissions or a voluntary offset initiative.

In this case, the promoter must submit an official document from the authorities responsible for the initial program showing compliance with the obligation. In addition, the authorities for the program to offset GHG emissions must provide a list of the credits concerned with their serial numbers and vintages;

(b)   the credits issued to the promoter of the original project have not been sold or purchased otherwise than between the person to whom the program to offset GHG emissions issued the credits and the promoter of the project implemented pursuant to this Regulation.

In this case, the promoter must submit an official document from the authorities responsible for the initial program showing that the current holder is the first and only owner of the carbon credits issued and that they have never been sold or purchased by a person other than the promoter. The authorities for the program to offset GHG emissions must provide a list of the credits concerned with their serial numbers and vintages;

(c)   the carbon credits issued to the promoter of the original project and the related GHG withdrawals taken into account in the project outcome pursuant to this Regulation have been withdrawn, cancelled or invalidated in the course of activities under the former carbon credits program and are no longer available to offset a GHG emission under the initial issuance program.

In this case, the promoter must submit an official document from the authorities responsible for the initial program showing compliance with the obligation and specifying the number of credits cancelled and the identification number and vintage of each credit cancelled.

The promoter must report to the Minister all the questions, actions and decisions raised or taken by the authorities responsible for the carbon credits program in connection with the validity of the project or the credits issued in the course of the activities under that program;

(15)   when the promoter is not the owner of the lot or part of a lot for the project, a declaration by the owner authorizing the implementation of the project by the promoter and undertaking not to apply, with respect to the GHG withdrawals covered by the project plan, either for offset credits under the Regulation respecting a cap-and-trade system for greenhouse gas emission allowances or for credits under another program to offset GHG emissions;

(16)   a declaration signed by the forest engineer responsible for supervising the project plan stating that the information and documents produced under the engineer's responsibility are complete and accurate;

(17)   a declaration signed by the promoter or the promoter's representative stating that the project will be implemented in accordance with this Regulation and that the documents and information provided are complete and accurate;

(18)   when the environmental impacts of the project have been assessed, a summary of the analysis and its conclusions;

(19)   a copy of every authorization needed for the implementation of the project;

(20)   the information provided for in paragraph 2 of section 70 concerning financial and fiscal assistance received during the implementation of the project;

(21)   the information needed to identify the forest engineers involved in filing the project;

(22)   the name and function of each person involved in drawing up the project plan;

(23)   the date and the signature of the promoter or the promoter's representative.

When a document signed by a forest engineer is required, it must be accompanied by the information needed to identify the forest consultant and the members of the team concerned.

TITLE V
PROJECT MONITORING

70.   The promoter must record the following information and documents in a register of events bearing the title, name and code of the project:

(1)   the information and documents relating to a natural or man-made disturbance, including in particular

(a)   the actual or estimated date on which the disturbance occurred;

(b)   the type of natural or man-made disturbance;

(c)   one or more maps of the lot showing and locating the areas disturbed with, as a minimum, the following layers: the outline of the lot and the areas managed for the project, the road network, the hydrographic network, the outline of the disturbed areas, the areas assigned to non-forestry purposes, forest stands and adjacent lots. The geographical entities for the project, such as the outline of each forest stand, must be numbered and described in a table accompanying the map or maps. The table must include, for each entity shown on the map, its number on the map and a summary description including the name of the ecoforest stratum and its surface area in hectares.

All the maps in the report must have, as the base layer, an aerial photograph or satellite image with a spatial resolution making it possible to distinguish transitions between contrasting geographic entities (for example, between a forest and a road). The resolution of the maps for the project must make it possible to perform a quick analysis of the attributes connected with the project;

(d)   the number of hectares affected by the disturbance and a description of the methodology used to assess it;

(e)   in the case of a natural disturbance, an estimate of the merchantable volume of timber affected in cubic metres and the methodology used;

(f)   in the case of a man-made disturbance caused by a forest development activity:

 i.   the type of forest development activity;

 ii.   a description of the forest development activity and its effect on the project, in particular on the growth curve;

iii.   the documents justifying the forest development activity, including in particular the silvicultural prescriptions and the pre- and post-treatment inventory reports;

iv. an estimate of the merchantable volume of timber, in cubic metres, affected by the forest development activity and the methodology used;

v. the reasons for implementing the forest development activity;

vi. where applicable, a description of the intended use of the harvested timber including proof of sale, the destination of each volume of timber harvested that is not retained, and the provincial distribution rate for the volume of timber harvested by type of timber forest product set out in Division I of Schedule F and information on whether or not it has been modified by the promoter, with the justification;

(g) any other information specifying the consequences of the disturbance for the carbon reservoirs;

(2) information and documents on the financial and fiscal assistance received during the project, including in particular

(a) the type of financial or fiscal assistance;

(b) the amount of the financial or fiscal assistance;

(c) the date on which the financial or fiscal assistance was obtained;

(d) the conditions for receiving the financial or fiscal assistance;

(e) the reason for requesting financial or fiscal assistance;

(f) the information needed to identify each program, organization and donor;

(3) in the case of an early project, information and documents on the program to offset GHG emissions, including in particular

(a) a copy of the project plan or its equivalent as submitted to the authorities for the program to offset GHG emissions, to justify the project's eligibility;

(b) a copy of the project reports or their equivalent as submitted to the authorities for the program to offset GHG emissions, to justify the issuance of carbon credits to the person responsible for the project;

(c) the information and data used for the calculations to establish the number of credits issued under another program to offset GHG emissions;

(4) all the data files used to compile inventories for the carbon reservoirs for the project;

(5) all the data and hypotheses used to simulate the baseline scenario and project scenario and the results of the simulations;

(6) the information needed to identify the person who recorded the information in the register, the person's function, and the date of recording.

TITLE VI
PROJECT REPORT

71. The promoter must file a project report for each reporting period not later than 8 months after the end of the period.

72. The project report must include the following information and documents in particular:

(1) where applicable, updates to the information and documents that have changed since the project was filed or since the last issuance request;

(2) where applicable, a detailed description of all the changes made to the planning and implementation of the project since the project was filed or since the last issuance request;

(3) the project code assigned by the Minister when confirming the project's eligibility;

(4) a presentation of the issuance inventory for the lot or part of a lot for the project, including all relevant elements and their justification;

(5)   a copy of the survey plan planned and a copy of the survey plan revised once the issuance inventory for the project has been completed, signed by a forest engineer and including the following information in particular:

(a)   information on the survey units for the lot or part of a lot for the project, including the number of routes and sample plots, their location and the starting point for each route;

(b)   a copy of the shape file presenting the revised survey plan once the inventory has been conducted and the information needed to identify and locate each route and each sample plot;

(6)   a copy of the compilation report from the issuance inventory, signed by a forest engineer and including the following information in particular:

(a)   updated information on the location and georeferences for each route, plot and micro-plot inventoried by the promoter;

(b)   the results of the compilation of the carbon reservoir inventories for the project;

(7)   where applicable, a copy of the report on soil sample analyses for the project prepared by the laboratory responsible for analyzing the samples;

(8)   a presentation of the baseline scenario and project scenario and the results of the simulation of the annual change in carbon stock including all relevant elements and their justification;

(9)   a presentation of the project outcome including all relevant elements and their justification;

(10)   a declaration signed by the promoter or the promoter's representative stating that no offset credits have been issued for the GHG withdrawals and effects mentioned in the project report under the Regulation respecting a cap-and-trade system for greenhouse gas emission allowances and that no credits have been issued under another program to offset GHG emissions or will be issued under such a program;

(11)   when the promoter is not the owner of the lot or part of a lot for the project, a declaration by the owner authorizing the implementation of the project by the promoter and undertaking not to apply, with respect to the GHG flows covered by the project plan, either for offset credits under the Regulation respecting a cap-and-trade system for greenhouse gas emission allowances or for credits under another program to offset GHG emissions;

(12)   a declaration signed by the promoter or the promoter's representative stating that the promoter still owns the effects of the carbon sequestrations for which the offset credits have been requested;

(13)   when a change in owner occurs during the reporting period covered by the project report and when the promoter is not the owner of the lot or part of a lot for the project, a declaration by the new owner authorizing the implementation of the project by the promoter and undertaking not to apply, with respect to the GHG withdrawals and effects covered by the project report, either for offset credits under the Regulation respecting a cap-and-trade system for greenhouse gas emission allowances or for credits under another program to offset GHG emissions;

(14)   a declaration signed by the forest engineer responsible for supervising the project report stating that the information and documents produced under the engineer's responsibility are complete and accurate;

(15)   a declaration signed by the promoter or the promoter's representative stating that the project has been implemented in accordance with this Regulation and that the documents and information provided are complete and accurate;

(16)   when the environmental impacts of the project have been assessed, a summary of the analysis and its conclusions;

(17)   a copy of every authorization needed for the implementation of the project;

(18)   the information provided for in paragraph 2 of section 70 concerning the financial and fiscal assistance received during the reporting period for the project;

(19)   the information needed to identify the forest engineers involved in the implementation of the project during the reporting period covered by the project report;

(20)   the name and function of each person involved in drafting the project report;

(21)   the date and signature of the promoter or the promoter's representative.

When a document signed by a forest engineer is required, it must be accompanied by the information needed to identify the forest consultant and team members concerned.

TITLE VII
VERIFICATION

CHAPTER I
GENERAL CONDITIONS

73.   The promoter must entrust the verification of a project plan or project report to a verification organization accredited under ISO 14065 by an accreditation body belonging to the International Accreditation Forum in Canada or the United States and according to an ISO 17011 program, with respect to the sector of activity for the project.

Despite the first paragraph, the verification of a project plan or project report may be entrusted to a verification organization that is not yet accredited, provided it is accredited in accordance with the first paragraph in the year following the verification of the project plan or project report.

74. The promoter may entrust the verification of a project plan or project report to a verification organization in accordance with section 73 if the organization, the verifier designated by that organization to carry out the verification and the other members of the verification team

(1)   have not acted for the promoter, in the 3 preceding years, as a consultant for the purpose of developing the project or calculating the GHG emission reductions attributable to the project;

(2)   have not verified project reports covering more than two consecutive reporting periods for the project being verified.

In addition, when the promoter wishes to have the project plan or project report verified by a verification organization other than the organization that verified the report for the preceding reporting period, the verification organization to which the verification is entrusted, the verifier designated by that organization to carry out the verification and the other members of the verification team, must not have verified a project plan or project report covering the three preceding reporting periods for that project.

75. The verifier designated by the verification organization must be a member of the Ordre des ingénieurs forestiers du Québec.

76. The verifier designated must form a verification team to perform tasks under the verifier's supervision. The verification team must have relevant experience in the following sectors: forest operations and management, forest inventories, statistics, and simulation of annual changes in the carbon stock of the biomass in an ecosystem.

77. In addition to the requirements of the standards ISO 14064-3 and ISO 14065 concerning conflicts of interest, the promoter must ensure that none of the following situations exists between the promoter, its officers, the verification organization and the members of the verification team referred to in section 76:

(1)   a member of the verification team or a close relative of that member has personal ties with the promoter or one of its officers;

(2)   during the 3 years preceding the year of the verification, one of the members of the verification team was employed by the promoter;

(3)   during the 3 years preceding the year of the verification, one of the members of the verification team provided the promoter with one of the following services:

(a) the design, development, commissioning or maintenance of a data inventory or data management system for GHG emissions from the establishment or facility of the promoter or, where applicable, for data on electricity or fuel transactions;

(b) the design, planning, implementation or supervision of a forest development project or a project to offset GHG emissions through forest development;

(c) the development of GHG emission factors, or the design and development of other data used for quantification purposes for any GHG emission reductions or withdrawals;

(d) a consultation concerning GHG emission reductions or GHG withdrawals from the atmosphere, in particular the design of an energy efficiency or renewable energy project and the assessment of assets relating to greenhouse gas sources, sinks and reservoirs;

(e) the preparation of manuals, guides or procedures connected with the reporting of the promoter's GHG emissions under the Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere;

(f) consultation in connection with a GHG allowances market, including

 i. brokerage, with or without registration, while acting as a promoter or subscriber on behalf of the promoter;

 ii. advice concerning the suitability of a GHG emissions transaction;

 iii. the holding, purchase, sale, negotiation or withdrawal of emission allowances referred to in the second paragraph of section 46.6 of the Environment Quality Act;

(g) a consultation in the field of health and safety and environmental management, including a consultation leading to ISO 14001 certification;

(h) actuarial consulting, bookkeeping or other consulting services relating to accounting documents or financial statements;

(i) a service connected with data management systems for a project of the promoter that is eligible for the issuance of offset credits;

(j)   an internal audit of GHG emissions;

(k)   a service provided in connection with litigation or an inquiry into GHG emissions;

(l)   a consultation for a GHG emissions reduction project or a GHG withdrawal project carried out in accordance with this Regulation or the Regulation respecting a cap-and-trade system for greenhouse gas emission allowances;

(4)   the independent verification examiner has previously provided the promoter with a verification service or other services referred to in subparagraph 3 for the reporting periods covered by the verification.

The existence of one of the situations described in the first paragraph or in section 74 is considered to be a conflict of interest that invalidates the verification.

For the purposes of this section, a close relative of a member of the verification team is that person's spouse, child, spouse's child, mother or father, mother's or father's spouse, child's spouse or spouse's child's spouse.

CHAPTER II
CONDUCT OF THE VERIFICATION

78.   The verifier carries out the verification of a project when the project is filed and when an issuance request for offset credits is made. The verification must, in particular, allow the verifier to observe

(1)   the implementation of the project;

(2)   any change made to the initial project with the preceding verification and changes to the project outcome over time;

(3)   the occurrence of natural or man-made disturbances, including in particular the completion of forest development activities on the lot or part of a lot for the project since the preceding verification.

79.   When the verifier and the verifier's team carry out a project verification, they must visit the lot or part of a lot for the project in the company of the promoter and the owner. In the case of an aggregation of projects, the verifier and the verifier's team must also comply with the parameters in section 99.

80. The verification must include a verification of the measures taken by the promoter during inventories. In the case of an aggregation of projects, the verifier and the verifier's team must also comply with the parameters in section 100.

For the verification of a project plan, the measures taken by the promoter during an inventory must be verified before the planting of seedlings or the sowing of seeds.

81. For the purposes of a project verification, the promoter and, where applicable, the owner of the lot or part of a lot for the project must give the verifier all information and documents needed for the verification and provide access to the lot or part of a lot for the project.

82. In addition to the requirements of ISO 14064-3, the verification of a project plan or project must be carried out in accordance with the conditions and methods set out in this Chapter and in compliance with the provisions of the Professional Code.

83. The verification of a project must

(1) be carried out in accordance with a detailed verification plan including, in particular, a specific survey plan to verify the measures taken by the promoter to estimate the state of the carbon stock in the reservoirs.

The survey plan used by the verifier to verify the measures taken by the promoter to estimate the state of the carbon stock in the reservoirs must provide for the verification of at least 10% of the sample plots for the project or the greater or of at least 3 sample plots, whichever is greater. The sample plots verified must be selected at random and taking the risk of error into account;

(2) the verification of the measures taken by the promoter must make it possible to confirm that the parameters in the table in Schedule G are met;

(3) for each sample plot verified, a label must be attached to the peg indicating the centre of the variable-radius plot of each micro-plot. The label must be weatherproof and specify the date of the verification and the name of the verifier responsible for the verification;

(4) be carried out in a way that ensures that each step in the project is free of significant errors, omissions and inaccuracies;

(5)   take into account, when the verification concerns the project plan, all the elements of the plan except the characterization and the simulation of the annual change in the carbon stock for the project scenario and the annual GHG flow outcome for the project.

For the purposes of this this Regulation, "significant errors, omissions and inaccuracies" means any errors, omissions and inaccuracies in the determination of the project outcome that are recorded in the project report for a reporting period that, individually or as an aggregate, result in an over-estimate or under-estimate of withdrawals greater than 5%.

84.   Every measurement instrument or other equipment used for verification purposes pursuant to this Chapter must be used in accordance with the manufacturer's instructions, be maintained in good working order and work reliably when used.

85.   The verifier must verify the following elements when verifying the project plan:

(1)   a description of the initial context for the project;

(2)   the biophysical characteristics of the lot;

(3)   the initial inventory of the lot or part of a lot for the project;

(4)   a summary description of the baseline scenario;

(5)   in the case of an early project, the requirements for the recognition of credits obtained through another program.

The characterization, the simulation of the annual change in the carbon stock for the project scenario and the annual GHG flow outcome for the project are excluded from the verification.

86.   When, during the verification, the verifier notes an error, omission or inaccuracy in the quantification of the GHG withdrawals attributable to the project or non-compliance with a condition of this Regulation, the verifier must inform the promoter.

87.   If, following the verification of the project plan or project report, as the case may be, the verifier concludes that it meets the conditions of this Regulation and contains no significant errors, omissions or inaccuracies, the verifier gives the promoter a verification notice attesting, with reasonable assurance,

(1)   in the first case, that the simulation of the baseline scenario contains no significant errors, omissions or inaccuracies and that the project plan meets the conditions of this Regulation;

(2)   in the second case, that the quantification of GHG withdrawals attributable to the project contains no significant errors, omissions or inaccuracies and that the project plan meets the conditions of this Regulation.

88.   If, following the verification of the project plan or project report as the case may be, the verifier notes a failure to comply with a condition, the verifier must

(1)   in the first case, assess its impact on the eligibility of the project, the validity of the initial inventory and the characterization of the baseline scenario and determine if it leads to significant errors, omissions or inaccuracies;

(2)   in the second case and with respect to a condition relating to the quantification of GHG withdrawals that cannot be corrected by the promoter, assess its impact on the GHG withdrawals recorded in the project report and determine if its leads to significant errors, omissions or inaccuracies.

If the failure to comply with a condition relating to the quantification of GHG withdrawals cannot be corrected by the promoter but does not lead to significant errors, omissions or inaccuracies, and if the verifier concludes that the other conditions of the Regulation have been met and that there are no significant errors, omissions or inaccuracies, the verifier gives the promoter a positive verification notice.

CHAPTER III
VERIFICATION REPORT FOR A PROJECT PLAN OR PROJECT REPORT

89.   Every verification of a project plan or project report must be recorded in a verification report.

The verification report for a project plan or project report must include the following information and documents in particular:

(1)   the information needed to identify the verification organization and the verifier designated to carry out the verification, the other members of the verification team and the independent examiner, and their function in the verification of the project plan or project report;

(2)   the information needed to identify the accrediting organization that accredited the verification organization for the verification, the sector of activity covered by the accreditation of the verification organization, and the period of validity of the accreditation;

(3)   information on the project, including the information needed to identify the promoter and, where applicable, the project code;

(4)   the verification plan and a description of its objectives and the activities completed by the verifier to verify the project plan, along with all exchanges of information between the verifier and the promoter for the purposes of the verification;

(5)   the period during which the verification was conducted and the date of any visit to the lot or part of a lot for the project;

(6)   the survey plan for the verification of the initial inventory or, as the case may be, the issuance inventory carried out by the verifier;

(7)   the percentage of precision of the initial inventory or, as the case may be, the issuance inventory calculated by the verifier;

(8)   the results of the verification based on the elements to be taken into consideration during the verification of the measures provided for in Schedule G;

(9)   where applicable, the results of the verification of the soil carbon inventory at each sampling point including

(a)   the calculations for the carbon stock;

(b)   the satellite geolocalization of the sampling points verified;

(c)   the 95% Dbm and Dbo confidence interval;

(d)   the precision of the values for soil carbon stock on a mass of mineral soil basis (Qcorrigé);

(e)   where applicable, a table showing the colour code for each soil sample verified with a description of the sampling point, including the promoter's route number, the micro-plot number and the number of the soil sample taken by the promoter;

(10) a list of all errors, omissions or inaccuracies noted in the quantification of GHG emissions reductions attributable to the project and all failures to comply with a condition of this Regulation, including the following information concerning them:

(a) their description;

(b) the date on which the promoter was informed of them;

(c) where applicable, a description of the action taken by the promoter to correct them and the date on which the action was taken;

(d) in the case of a failure to comply with a condition relating to the quantification of the GHG withdrawals attributable to the project that cannot be corrected by the promoter, an assessment of the impact of each on the quantification of withdrawals and the opinion of the verifier concerning the significant errors, omissions and inaccuracies within the meaning of the second paragraph of section 83 that may have occurred as a result;

(11) where applicable, the version and date of the project plan or project report revised following the verification;

(12) a copy of the verification notice given to the promoter pursuant to sections 87 and 88 along with the justifications for the notice;

(13) a declaration by the verification organization and verifier that the verification was conducted in accordance with this Regulation and ISO 14064-3;

(14) a declaration concerning conflicts of interest, including

(a) the information needed to identify the verification organization, the members of the verification team and the independent examiner, and the sector of activity covered by the accreditation of the verification organization;

(b) a copy of the organization chart for the verification organization;

(c) a declaration signed by a representative of the verification organization attesting that the conditions of sections 74 and 77 have been met and that the risk of conflict of interest is acceptable;

(15) a description of the experience of the members of the verification team in connection with the project;

(16) the name and function of every person involved in the drafting of the verification report;

(17) the date and the signature of the verifier;

(18) in addition to the above requirements, the verification report for a project report which, in the case of an aggregation of projects, may record the verification of several project reports, must include the following information and documents in particular:

(a) the reporting period covered by the verification and the quantity of offset credits to be issued to the promoter that are attributable to the project for the reporting period verified;

(b) where applicable, a notice concerning the accuracy of the percentage of timber harvested entered into the MBC-SCF software;

(c) where applicable, a notice concerning the inclusion in the baseline scenario and project scenario of events entered in the register of events;

(d) where applicable, a notice concerning the accuracy of the results of the calculation used to determine the presence of a leak pursuant to Chapter VII of Title III;

(e) when the verifier concludes that errors, omissions or inaccuracies have occurred in the determination of the project outcome, the determination of the annual and total quantities of GHG flows and the number of offset credits to be issued to the promoter that, in the verifier's opinion, are actually attributable to the project.

TITLE VIII
SPECIAL PROVISIONS CONCERNING AN AGGREGATION OF PROJECTS

90. A promoter who creates an aggregation of projects must submit a summary of the aggregation to the Minister. The summary must include the following information and documents:

(1) the information needed to identify the promoter and the promoter's representative;

(2) a brief description of the aggregation;

(3) a summary of the aggregation including the following information:

(a) the estimated or actual number of projects in the aggregation;

(b) a list of the codes for each project in the aggregation;

(c) the estimated start and end dates of the reporting periods for the estimated duration of the aggregation;

(d) the start and end dates for the aggregation when known, or an estimate. The start date for an agrégation is the start date for a project in the aggregation that is furthest in the past. The end date for an aggregation of projects is the end date for a project in the aggregation that is furthest in the future;

(e) an estimate of the total number of offset credits to be issued for each reporting period and the total number of offset credits for the duration of the aggregation;

(4) the signature of the promoter and, where applicable, the promoter's representative, with the date of signing.

91. A promoter who wishes to add a project to an aggregation whose eligibility has yet to be confirmed by the Minister must file the project in the usual manner set out in Title IV.

Once the eligibility of the project has been confirmed by the Minister, the promoter must submit a project modification notice to the Minister to include the project in the aggregation and update the information in the project notice provided for in section 68 and in the summary of the aggregation provided for in section 90.

92. The promoter must notify the Minister when a project is withdrawn from an aggregation and continued, within 30 days of the withdrawal. The promoter must then submit a notice to the Minister to update the information contained in the project notice provided for in section 68 and in the summary of the aggregation provided for in section 90.

93. The promoter must notify the Minister when a project is terminated, within 45 days of the termination. The promoter must then submit a notice to the Minister including the information prescribed for the notice of termination provided for in section 9 and updating the information contained in the project notice provided for in section 68 and the summary of the aggregation provided for in section 90.

The promoter must include a report on the state of forest stands drawn up by a member of the Ordre des ingénieurs forestiers du Québec when the project has not been verified to ensure the compliance of the measures taken by the promoter in accordance with Schedule G during the inventory for the last issuance of offset credits.

The promoter must also notify the Minister when an aggregation is terminated, within 45 days of the termination. The promoter must include with the notice the report provided for in the second paragraph for projects that have not been verified to ensure the compliance of the measures taken by the promoter in accordance with Schedule G during the inventory for the last issuance of offset credits.

94. The report on the state of forest stands must include the following information and documents in particular:

(1)   the date of the report;

(2)   the project code;

(3)   the information needed to identify the promoter, as entered in the general account opened by the Minister for the transferee under section 14 of the Regulation respecting a cap-and-trade system for greenhouse gas emission allowances following the transferee's registration for the cap-and-trade system for emission allowances, and the name of the person responsible for the project;

(4)   the start date and end date of the verification and the date of the visit of the lot or part of a lot for the project;

(5)   the name and function of the persons involved in assessing the state of the forest stands;

(6)   a description of the activities carried out by the forest engineer to assess the state of the forest stands;

(7)　an image interpreted from an analogical aerial photograph at the scale of 1 : 15 000 or better, an image from a digital aerial photograph with a spatial resolution of 30 cm or better, or a satellite image with a spatial resolution of 50 cm or better, taken at a date as close as possible to the date of the notice provided for in the preceding section, showing the boundaries of the lot for the project;

(8)　the results of the interpretation of the analogical aerial photograph, digital aerial photograph or satellite image. The interpretation must, in particular, focus on the following elements:

(a)　stand density;

(b)　tree height;

(c)　the presence or absence of natural or man-made disturbances. When a disturbance is noted, the promoter must specify the year and cause of the disturbance and the area affected;

(d)　a conclusion as to whether the forest capital on the lot or part of a lot for the project, when the comparative analysis is performed, is sufficient to support the project outcome declared at the last issuance request for offset credits and to ensure the environmental integrity of the credit issued;

(e)　the date and the signature of the forest engineer who drew up the report.

95.　When the conclusion of the report on the state of the forest stands is positive, the Minister withdraws the project from the aggregation, terminates the project and notifies the promoter.

96.　When the conclusion of the report on the state of the forest stands is negative, the Minister notifies the promoter, and the promoter must then conduct a new inventory, draw up a new report on the state of the forest stands and file a new issuance request for offset credits.

The new issuance request must be filed for a period beginning on the start date of the reporting period covered by the preceding issuance request for offset credits and ending on the date of the notice provided for in the first paragraph.

97. The promoter must plan and conduct the initial inventory and issuance inventory for all areas managed for the purposes of the projects covered by an issuance request for offset credits.

The 90% precision threshold for inventories, as provided for in section 18, applies to all areas managed for the purposes of the projects covered by an issuance request for offset credits.

98. When an issuance request for offset credits is filed, the promoter may request the issuance of offset credits for some or all of the projects in an aggregation.

99. When an issuance request is filed, the verifier must visit the lots or parts of lots for at least 30% of the projects covered by the application.

100. When the first issuance request for offset credits is filed, the verifier must verify, in accordance with Schedule G, the measures taken by the promoter for at least 30% of the projects covered by the application.

The verifier must, in the verification report, provide an explanation of the way in which projects were selected to meet the 30% threshold.

101. For each period for the issuance of offset credits following the first issuance request, the verifier must determine the projects to be included to meet the threshold provided for in section 100 by prioritizing the selection of projects among those for which measures were not verified for a preceding issuance request.

102. The verification notice submitted to the Minister following an issuance request for offset credits and its conclusion apply to all the projects in the aggregation covered by the application.

TITLE IX
ADMINISTRATIVE AND PENAL PROVISIONS

CHAPTER I
MONETARY ADMINISTRATIVE PENALTIES

103. A monetary administrative penalty of $500 in the case of a natural person or $2,500 in other cases may be imposed on any person who

(1) in contravention of this Regulation, refuses or fails to file any notice, information, report or other document, or fails to produce it within the required time;

(2)   contravenes the first, second and third paragraphs of section 11, the first paragraph of section 73 or section 81;

(3)   contravenes any other requirement of this Regulation, if no other monetary administrative penalty is otherwise specified for that contravention by this Title or by the Environment Quality Act.

104.   A monetary administrative penalty of $1,000 in the case of a natural person or $5,000 in other cases may be imposed on any person who contravenes the first paragraph of section 17 or section 74.

CHAPTER II
PENAL SANCTIONS

105.   Every person who

(1)   refuses or fails to file any notice, information, report or other document, or fails to produce it within the required time;

(2)   contravenes the first, second and third paragraphs of section 11, the first paragraph of section 73 or section 81;

(3)   contravenes any other requirement of this Regulation, if no other monetary administrative penalty is otherwise specified for that contravention by this Title or by the Environment Quality Act

commits an offence and is liable, in the case of a natural person, to a fine of $3,000 to $100,000 and, in other cases, to a fine of $3,000 to $600,000.

106.   Every person who contravenes the first paragraph of section 17 or section 74 commits an offence and is liable, in the case of a natural person, to a fine of $6,000 to $250.000 and, in other cases, to a fine of $25,000 to $1,500,000.

107.   Every person who, for the purposes of this Regulation, communicates to the Minister information that is false or misleading commits an offence and is liable, in the case of a natural person, to a fine of $5,000 to $500,000 or, despite article 231 of the Code of penal procedure (chapter C-25.1), to a maximum term of imprisonment of 18 months, and, in other cases, to a fine of $15,000 to $3,000,000.

TITLE X
FINAL PROVISION

108.   This Regulation comes into force on the fifteenth day following the date of its publication in the *Gazette officielle du Québec*.

SCHEDULE A – Layout of a sample plot and soil sampling points

(ss. 20 and 27)
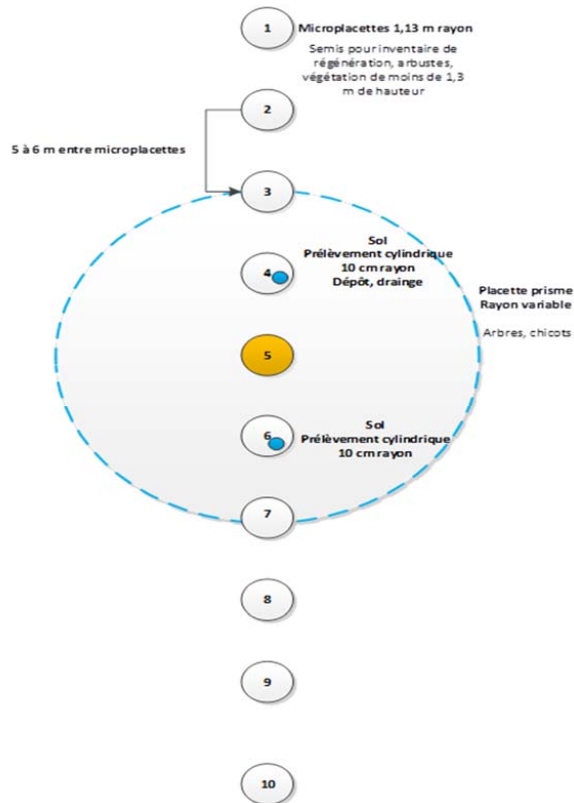
Key:

Large dotted circle: variable-radius plot in which the promoter must inventory living aerial biomass and dead biomass in the tree and shrub strata above 1.3 m in height.

Micro-plot 5: centre of the variable-radius plot.

Micro-plots 1 to 10: micro-plots 1.13 m in diameter in which the promoter must inventory aerial biomass in the shrub, grass and moss strata.

Small circles in micro-plots 4 and 6: micro-plots in which a soil sample must be taken when more than 25% of the surface area of lot or part of a lot for the project is disturbed by site preparation work for the planting of seedlings or the sowing of seeds.

SCHEDULE B – Allometric equations used to estimate the aerial biomass certain species present on a sample plot

(s. 24)

	Equation	b_0	b_1	a_{15}	b_{15}	Reference
Parameter values						
Abies balsamea	A5, A6	72.715	2.25	0.0684	1.1302	Roussopoulos & Loomis 1979; Ker 1984
Abies balsamea	A1	0.1746	2.1555			Ker 1984
Acer pensylvanicum	A4	-3.518	2.878			Telfer 1969
Acer rubrum	A1	0.197	2.1933			Ker 1984
Acer rubrum	A4	-4.194	2.094			Telfer 1969
Acer saccharum	A1	0.1599	2.3376			Ker 1980
Acer saccharum[1]	A4	-4.194	2.094			Telfer 1969
Acer spicatum	A5, A6	73.182	2.259	0.1645	1.0485	Roussopoulos & Loomis 1979
Acer spicatum	A1	0.204	2.2524			Whittaker & al. 1979
Alnus rugosa	A5, A6	63.28	2.38	0.1409	1.0225	Roussopoulos and Loomis 1979
Alnus rugosa	A1	0.2612	2.2087			Young & al. 1980
Amelanchier sp[2]	A5, A6	71.534	2.391	0.0142	1.1037	Roussopoulos & Loomis 1979
Amelanchier sp.	A1	0.2612	2.2087			Young & al. 1980
Betula alleghaniensis	A2	-1.8337	2.1283			Ker 1980
Betula papyrifera	AS, A6	73.316	2.279	0.713	1.0452	Roussopoulos and Loomis 1979; Ker 1984
Betula papyrifera	A1	0.1545	2.3064			Ker 1984

[1] The equation for *A. rubrum* is used.

[2] The equation for *A. rugosa* is used.

Cornus stolonifera	A5, A6	74.114	2.457	0.0243	1.0828	Roussopoulos & Loomis 1979
Cornus stolonifera[3]	A1	0.0616	2.5094			Perala & Alban 1994
Corylus cornuta	A5, A6	62.819	2.42	o.1894	0.9226	Roussopoulos & Loomis 1979
Crataegus sp.	A5, A6	63.28	2.38	0.1409	1.0225	Roussopoulos & Loomis 1979
Crataegus sp.	A1	0.2612	2.2087			Young & al. 1980
Diervilla lonicera	A5, A6	14.211	1.217	0.1062	0.8818	Roussopoulos & Loomis 1979
Fagus grandifolia	A1	0.1958	2.2538			Ker 1980
Fagus grandifolia	A4	-3.647	2.906			Telfer 1969
Juniperus communis	A3	59.205	2.202			Smith & Brand 1983
Larix laricina	A1	0.0946	2.3572			Ker 1980
Lonicera canadensis	A4	-2.427	2.77			Telfer 1969
Nemopanthus mucronatus	A4	-3.04	2.819			Telfer 1969
Picea abies	A1	0.0777	2.472			Harding and Grigal 1985
Picea glauca	A1	0.0777	2.472			Harding and Grigal 1985
Picea glauca	A5, A6	65.757	2.287	0.0715	1.1241	Roussopoulos & Loomis 1979
Picea abies	A5, A6	65.757	2.287	0.0715	1.1241	Roussopoulos and Loomis 1979
Picea mariana	A1	0.1683	2.1777			Ker 1980
Picea mariana	A3	0.5072	1.9246			Wagner & Ter-Mikaelian 1999
Picea rubens[4]	A1	0.166	2.2417			Freedman et al. 1982
Picea rubensd	A3	0.5072	1.9246			Wagner & Ter-Mikaelian 1999
Pinus banksiana	A1	0.152	2.273			Ker 1980

[3] The equation for *Salix sp.* is used.

[4] The equation for *P.mariana* is used.

Pinus banksiana	A3	0.1694	2.3002			Wagner & Ter-Mikaelian 1999
Pinus resinosa	A1	0.0847	2.3503			Ker 1980
Pinus resinosa	A3	0.1219	2.4618			Wagner & Ter-Mikaelian 1999
Pinus strobus	A1	0.1617	2.142			Ker 1980
Pinus strobus	A3	0.1404	2.2918			Wagner & Ter-Mikaelian 1999
Populus balsamifera[56]	A5, A6	46.574	2.527	0.1294	1.0517	Roussopoulos & Loomis 1979
Populus tremuloides	A1	0.1049	2.391			Ker 1984
Populus tremuloides	A4	-2.92	2.715			Telfer 1969
Prunus pensylvanica	A5, A6	68.041	2.237	0.1151	1.0676	Roussopoulos & Loomis 1979
Prunus pensylvanica	A1	0.1556	2.1948			Young & al. 1980
Prunus sp.	A5, A6	68.041	2.237	0.1151	1.0676	Roussopoulos & Loomis 1979
Prunus virginiana	A1	0.2643	1.7102			Young et & 1980
Prunus virginiana	A3	9.934	2.92			Brown 1976
Quercus rubra	A1	0.1335	2.422			Perala & Alban 1994
Quercus rubra	A4	-2.299	2.649			Telfer 1969
Ribes sp.	A3	49.001	3.112			Brown 1976
Rubus idaeus	A3	43.992	2.86			Brown 1976
Salix sp.	A1	0.0616	2.5094			Perala & Alban 1994
Salix sp.	A4	-1.519	2.325			Telfer 1969
Sorbus americana	A5, A6	44.394	3.253	0.0263	1.1373	Roussopoulos & Loomis 1979
Sorbus americanca[7]	A1	0.1556	2.1948			Young & al. 1980
Thuja occidentalis	A5, A6	68.423	1.863	0.1853	1.0906	Roussopoulos and Loomis

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[5] The equation for *Populus* sp. is used.

[6] The equation for *P. mariana* is used.

[7] The equation for *P. pensylvanica* is used.

						1979; Ker 1984
Thuja occidentalis	A1	0.1148	2.1439			Ker 1980
Vaccinium angustifolium	A4	-3.978	3.706			Telfer 1969
Viburnum alnifolium	A4	-4.079	3.243			Telfer 1969
Viburnum cassinoides	A4	-2.613	2.774			Telfer 1969

Explanatory note: six different equations are used to determine the biomass of aerial ligneous vegetation (B) (DBH: diameter at breast height; DSH: diameter at stump height; D15: diameter at height of 15 cm).

[A1] $B = b_0 \times DBH^{b1}$

[A2] $B = b_0 + b_1 \times \log DBH$

[A3] $B = b_0 \times DSH^{b1}$

[A4] $B = b_0 + b_1 \times \log DSH$

[A5] $B = b_0 \times D15^{b1}$

[A6] $D15 = (DSH - a_{15})/b_{15}$

SCHEDULE C – Soil carbon calculation method

(ss. 13, 28 and 30)

DIVISION I
SOIL SAMPLING STEPS AND VARIABLES OBTAINED

Soil sampling step	Variable obtained during sampling
Locate on the ground, using a metal peg, each soil sampling point on sample plot (n = 2, see diagram in Schedule A).	Physical location and geolocation by satellite
Take volumetric samples at 3 depths, for each of the 2 sampling points.	V_t
For each sample taken, measure the depth reached by the probe.	E_h

Assess the overall percentage of soil stoniness, in other words the percentage of the soil comprising stones with a diameter greater than that of the probe. This value should not change from one sample to another.	f_m'
Determine the colour of each soil sample taken using a Munsell soil colour chart.	CodeMunsell

DIVISION II
LABORATORY ANALYSIS STEPS AND VARIABLES OBTAINED

1. The laboratory report must show that the steps in the table below have been completed and described the calibration process for the apparatus used to measure carbon in the soil samples.

Laboratory step	Variable obtained
Crush a fraction of the sample <150 μm (100 Mesh). (Required step for C analysis using a LECO brand device)	---
Note the mass of the initial sample	M
Dry the soil samples at room temperature ($\approx$ 21 °C, $\approx$ 48-72 h).	---
Determine the total mass of the dry sample (g).	M_t
Separate fine soil particles (diam < 2 mm) from coarse soil particles (diam > 2 mm) in each sample by sieving. Crush clay soils to 2.5 mm.	---
Determine the mass of the fine soil sample (g).	M_f
Determine the moisture content of the dry sample (on the basis of the anhydrous mass of the soil at 105°C).	% H
Determine the mass density of the sample knowing the % H, M_t and the value of the input variables in equation 27 (below)	Db
Determine the percentage of organic matter using the loss-on-ignition method for the sample (%) at 375°C.	F_o
Determine the organic carbon concentration of the sample by ignition (using, for example, a LECO brand device [%; g/kg or mg/kg or ppm; on the basis of the anhydrous mass of the soil at 105°C]).	C_h

DIVISION III
CALCULATION OF SOIL CARBON

1. Soil carbon is calculated using equation 19:

Equation 19

$$Q = k \sum_{h=1}^{3} (T_{eh} \times D_{bh} \times C_h)$$

Where:

Q = Sum of the content of an element in each soil horizon to the selected depth, by hectare (metric tonnes/ha);

k = Scale factor (k = 0.1 if "C" is expressed in g/kg or k = 0.0001 if "C" is expressed in mg/kg or ppm);

h = Number of horizons (3 for samples taken at 0-10 cm, 10-20 cm and 20-30 cm depth);

T_{eh} = Effective thickness of fine soil (soil without stones or coarse fragments) in horizon h (cm), calculated using equation 20;

D_{bh} = Apparent density of horizon h (g/cm^3), calculated using equation 22 or, in other cases, using equation 23;

C_h = Concentration of carbon in fine soil (g/kg or mg/kg or ppm) of sample h.

Equation 20

$$E_{e_h} = E_h \times (1 - f_m) \times (1 - f'_m)$$

Where:

E_{eh} = Effective thickness of fine soil in the sample (cm);

E_h = Measured thickness of the sample (here, the measured thickness of the soil sample (~10 cm));

f'_m= Fraction of the soil composed of stones, assessed in the field (stoniness; 0.00);

f_m = Average fraction by volume of coarse fragments in the volumetric sample (0.00), calculated using equation 21.

Equation 21

$$f_m = \frac{(M_t - M_f)}{\rho_m \times V_t}$$

Where:

f_m = Average fraction by volume of coarse fragments in the volumetric sample (0.00);

M_t = Total dry mass of the volumetric sample (g);

M_f = Dry mass of fine soil (g);

ρm = Density of coarse fragments (presumed to be equal to 2.65 g/cm^3 for stones);

V_t = Total volume of the sample (depending on the probe used, cm^3).

Equation 22

$$D_b = \frac{\left[(100 - \%H) \times M_f\right]}{100 \times [V_t (1 - f_m)]}$$

Where:

D_b = Apparent observed density of individual samples taken using a volumetric probe g/cm^3);

$\%H$ = Moisture content of the air-dried sample (%);

M_f = Dry mass of fine soil (g);

V_t = Total volume of the sample (depending on the probe used, cm^3);

f_m = Average fraction by volume of coarse fragments in the volumetric sample (0.00), calculated using equation 21.

Equation 23

$$D_b = \frac{D_{bm} D_{bo}}{F_o D_{bm} + (1 - F_o) D_{bo}}$$

Where:

D_b = Apparent calculated density of individual samples taken using a Dutch auger g/cm^3);

D_{bm} = Constant: apparent density of mineral soil without organic matter (g/cm^3);

D_{bo} = Constant: apparent density of organic matter without mineral content (g/cm^3);

F_o = Proportion of organic matter observed in individual samples after analysis of the organic matter (0.00);

The values D_{bm} et D_{bo} may be estimated using all the D_b and F_o data for soils from the same plantation and equation 23. The values of the constants D_{bm} and D_{bo} in equation 23 may be calculated using statistical software.

DIVISION IV
CORRECTION OF CARBON STOCK IN SOIL

1. The carbon stock in the soil must be corrected using equation 24 to establish any change during a reporting period.

The average mineral soil mass (M) obtained during the first sampling campaign must be used during subsequent sampling campaigns as a reference to calculate the average variation in carbon stocks and the 90% confidence interval for soil carbon stocks.

Equation 24

$$Q_{corrigé} = Q + k \, (E_a \times D_b \times C_{III})$$

Where:

Q = Sum of the content of an element in each soil horizon to the selected depth, by hectare (metric tonnes/ha), calculated using equation 19;

k = Scale factor (k = 0.1 if "C" is expressed in g/kg or k = 0.0001 if "C" is expressed in mg/kg or ppm);

T_a = Additional thickness (or, if negative, surplus thickness) of the last sample at the base of the soil profile to be added to the carbon stock (cm), calculated using equation 25;

D_b = Apparent observed or calculated density of individual samples (here, the sample is extracted at a depth of 20-30 cm) (g/cm^3);

C_{III} = Concentration of the element in fine soil from the last sample at the base of the soil profile sampled (here, the sample is extracted at a depth of 20-30 cm) (g/kg or mg/kg or ppm).

Equation 25

$$E_a = \frac{(M_0 - M_t) \times 0,01}{D_{bIII}}$$

Where:

T_a = Additional thickness (or, if negative, surplus thickness) from the last sample at the base of the soil profile sampled to be added to the carbon stock (cm);

D_{bIII} = Apparent density, measured (equation 22) or calculated (equation 23), of the last sample (~20-30cm) at the base of the soil profile sampled (g/cm^3);

M_0 = Total mass of reference mineral soil at time t = 0 (metric tonnes/ha);

M_t = Total mass of mineral soil from sample point at time t = 20 years or more (metric tonnes/ha).

Equation 26

$$M = D_{bm} \times 100 \sum_{h=1}^{n} E_{e_h}$$

Where:

M = Mass of mineral soil to the depth (E_{eh}) selected (metric tonnes/ha);

D_{bm} = Apparent density of mineral soil without organic matter (g/cm^3);

E_{eh} = Effective thickness of fine soil in the sample (cm), calculated using equation 20;

h = number of horizons (3 for samples taken at depths of 0-10, 10-20 and 20-30 cm).

SCHEDULE D – Selection of the growth curve for the baseline scenario and tables showing the annual change in merchantable volume on fallow land by bioclimatic subdomain and potential vegetation groups

(s. 38)

1.   The tables in Division II of this Schedule contain the data needed to define the growth curve for the baseline scenario in the MBC-SCF software for a project on a lot without forest cover.

The growth curve selected must be representative of the biophysical characteristics and species present at the time of the initial inventory.

2.   For the purposes of this Schedule, a lot without forest cover includes lots used for non-forestry purposes and unproductive forest land.

DIVISION I
POTENTIAL VEGETATION GROUPS

1.   The codes FE_ MJ_ MS_ RB_ RS_ RE_ in the tables in Division II of this Schedule represent potential vegetation groups. The composition of the groups is determined in the tables below.

Table 1 – Name and code of stands based on the composition of dominant species in the stand (Hardwood species on rich sites (FE_))

Designation	Code
Red oak stand	FC1
Maple stand with bitternut hickory	FE1
Maple stand with linden	FE2
Maple stand with yellow birch	FE3
Maple stand with yellow birch and beech	FE4
Maple stand with eastern hop-hornbeam	FE5
Maple stand with red oak	FE6

Table 2 – Name and code of stands based on the composition of dominant species in the stand (Hardwood species on mesic sites (MJ_))

Designation	Code
Black ash stands with fir	MF1
Yellow birch stands with fir and sugar maple	MJ1
Yellow birch stands with fir	MJ2
Fir stand with yellow birch	MS1

Table 3 – Name and code of stands based on the composition of dominant species in the stand (Mixed species (MS_))

Designation	Code
Black spruce stand with trembling aspen	ME1
Fir stand with white birch	MS2
Fir stand with red maple	MS3
Fir stand with mountain white birch	MS4
Fir stand with red maple	MS6

Table 4 – Name and code of stands based on the composition of dominant species in the stand (Softwood species on rich sites (RB_))

Designation	Code
White spruce stand or cedar stand resulting from agriculture	RB1
Maritime white spruce stand	RB2
White spruce stand resulting from browsing by white-tailed deer (Anticosti island)	RB5

Table 5 – Name and code of stands based on the composition of dominant species in the stand (Softwood species on mesic sites (RS_))

Designation	Code
Spruce stand with red spruce	RR1
Fir stand with black spruce	RS2
Fir stand with black spruce and sphagnum moss	RS3
Fir stand with mountain black spruce	RS4
Fir stand with red spruce	RS5
Fir stand with maritime black spruce	RS7

Table 6 – Name and code of stands based on the composition of dominant species in the stand (Softwood species on poor sites (RE_))

Designation	Code
Black spruce stand with lichens	RE1
Black spruce stand with moss or heathland	RE2
Black spruce stand with sphagnum moss	RE3
White pine or red pine stand	RP1

Table 7 – Name and code of stands based on the composition of dominant species in the stand (Fir stand with thuya (RS1))

Designation	Code
Fir stand with thuya	RS1

DIVISION II
TABLES SHOWING ANNUAL CHANGE IN MERCHANTABLE VOLUME ON FALLOW LAND BY BIOCLIMATIC SUBDOMAIN AND POTENTIAL VEGETATION GROUPS

1.   The data used to create the growth curve for the baseline scenario used in the MBC-SCF software must be selected from the tables in this Division.

Tables 1 to 18 show merchantable volume on fallow woodland, Table 19 shows merchantable volume on fallow shrubland and Table 20 shows merchantable volume on fallow grassland.

2.   The table to be used must be selected on the basis of the bioclimatic subdomain and potential vegetation group on the lot used for the project. The potential vegetation group can be deduced from the vegetation in neighbouring forests.

3.   In Tables 1 to 4, the percentage coverage provided by the tree stratum and must be assessed to select the data representing the annual change in merchantable volume.

Coverage is

(1)   low from 0% to 8%;

(2)   medium from more than 8% to 15%;

(3)   high from more than 15% to 25%.

4.   For the purposes of the tables in this Division, with respect to bioclimatic subdomains,

"1" means maple stands with bitternut hickory;

"2 West" means maple stands with linden, western sector;

"2 East" means maple stands with linden, eastern sector;

"3 West" means maple stands with yellow, western sector;

"3 East" means maple stands with yellow birch, eastern sector;

"4 West" means fir stands with yellow, western sector;

"4 East" means fir stands with yellow birch, eastern sector;

"5 West" means fir stands with moss, western sector;

"5 East" means fir stands with white birch, eastern sector.

Table 1 – Growth curve values (merchantable volume in m³/ha) on fallow woodland with softwood forest cover based on bioclimatic subdomains and potential vegetation groups

Bioclimatic subdomains	4 East/ 4 West			5 East			5 West		
Potential vegetation groups	RS/RE			RS/RE			RS/RE		
	Merchantable volume (m³/ha)			Merchantable volume (m³/ha)			Merchantable volume (m³/ha)		
Age	High	Medium	Low	High	Medium	Low	High	Medium	Low
1	0	0	0	0	0	0	0	0	0
5	0	0	0	1	0	0	1	0	0
10	3	2	0	3	1	0	3	1	0
15	8	5	1	8	2	0	8	3	0
20	15	10	3	15	5	1	15	6	1
25	25	17	6	24	10	3	24	11	3
30	36	25	10	35	17	5	34	19	5
35	49	34	14	46	25	9	47	28	9
40	64	44	20	59	35	14	59	38	14
45	79	55	26	72	46	20	73	49	20
50	94	66	33	86	57	27	87	61	27
55	109	77	40	99	69	35	101	73	36
60	124	89	48	112	80	44	114	85	44
65	138	100	56	125	91	53	128	96	54
70	151	111	64	137	102	63	140	107	64
75	164	122	71	149	112	73	152	116	73
80	175	132	79	160	121	82	163	125	83
85	185	141	87	169	129	91	174	132	92
90	195	150	94	178	136	100	183	139	101
95	203	158	101	187	141	108	191	144	109
100	210	165	107	194	146	115	199	148	116

Table 2 – Growth curve values (merchantable volume in m³/ha) on fallow woodland with mixed forest cover based on bioclimatic subdomains and potential vegetation groups

Bioclimatic subdomains	4 East / 4 West			5 East		
Potential vegetation groups	MS_ / RB_			MS_ / RB_		
	Merchantable volume (m³/ha)			Merchantable volume (m³/ha)		
Age	High	Medium	Low	High	Medium	Low
1	0	0	0	0	0	0
5	0	0	0	0	0	0
10	2	2	2	2	2	2
15	7	6	6	5	6	6
20	14	12	11	12	12	11
25	24	19	17	21	19	17
30	36	28	25	33	28	25
35	49	38	33	46	38	33
40	63	49	41	62	49	41
45	78	60	50	78	60	50
50	93	71	59	94	71	59
55	108	82	68	110	82	68
60	122	93	77	125	93	77
65	135	104	85	139	104	85
70	146	114	92	151	114	92
75	157	123	99	162	123	99
80	166	132	105	172	132	105
85	174	139	110	180	139	110
90	181	146	115	186	146	115
95	186	152	119	191	152	119
100	190	158	123	194	158	123

Table 3 – Growth curve values (merchantable volume in m³/ha) on fallow woodland with mixed forest cover based on bioclimatic subdomains and potential vegetation groups

Bioclimatic subdomains	5 West		
Potential vegetation groups	MS_ /RB_		
	Merchantable volume (m³/ha)		
Age	High	Medium	Low
1	0	0	0
5	0	0	0
10	2	2	0
15	6	5	1
20	14	9	3
25	24	15	5
30	36	23	8
35	50	31	12
40	65	40	17
45	81	50	23
50	96	60	30
55	111	71	37
60	125	81	44
65	137	92	51
70	149	102	59
75	158	112	67
80	167	122	74
85	173	131	81
90	178	140	88
95	182	148	94
100	184	156	100

Table 4 – Growth curve values (merchantable volume in m³/ha) on fallow woodland with hardwood forest cover based on bioclimatic subdomains and potential vegetation groups

Bioclimatic subdomains	4 East / 4 West 5 East / 5 West			4 East /4 West 5 East / 5 West		
Potential vegetation groups	MS_			RB_		
	Merchantable volume (m³/ha)			Merchantable volume (m³/ha)		
Age	High	Medium	Low	High	Medium	Low
1	0	0	0	0	0	0
5	2	1	1	2	1	1
10	10	4	3	10	4	3
15	22	10	7	22	10	7
20	37	18	12	37	18	12
25	53	27	19	53	27	19
30	69	38	26	69	38	26
35	84	49	33	84	49	33
40	98	60	41	98	60	41
45	111	71	48	111	71	48
50	122	82	55	122	82	55
55	131	91	62	131	91	62
60	139	99	69	139	99	69
65	145	106	75	145	106	75
70	149	112	80	149	112	80
75	151	117	85	151	117	85
80	152	121	90	152	121	90
85	152	123	93	152	123	93
90	151	125	97	151	125	97
95	149	126	99	149	126	99
100	146	126	101	146	126	101

Table 5 – Growth curve values (merchantable volume in m³/ha) on fallow woodland with softwood, mixed or hardwood forest cover based on bioclimatic subdomains and potential vegetation groups

Bioclimatic subdomains	1	2 East	2 West	3 East	3 West
Potential vegetation groups	FE_	FE_	FE_	FE_	FE_
Age	Merchantable volume (m³/ha)			Merchantable volume (m³/ha)	
1	0	0	0	0	0
5	1	1	1	1	1
10	4	4	4	6	5
15	9	9	9	12	12
20	17	16	17	21	20
25	26	26	26	31	31
30	37	37	37	42	42
35	48	49	48	54	54
40	61	62	61	66	66
45	74	75	74	78	79
50	87	89	87	90	91
55	100	103	100	102	104
60	113	116	113	113	115
65	125	130	125	124	126
70	137	142	137	134	137
75	148	154	148	143	146
80	159	165	159	152	155
85	168	176	168	160	163
90	177	185	177	167	170
95	185	194	185	173	177
100	192	202	192	179	182

Table 6 – Growth curve values (merchantable volume in m³/ha) on fallow woodland with softwood, mixed or hardwood forest cover based on bioclimatic subdomains and potential vegetation groups

Bioclimatic subdomains	4 East	4 West	5 East	5 West
Potential vegetation groups	FE_	FE_	FE_	FE_
Age	Merchantable volume (m³/ha)		Merchantable volume (m³/ha)	
1	0	0	0	0
5	1	1	1	1
10	3	5	4	4
15	8	10	9	9
20	15	18	16	16
25	23	27	24	24
30	33	36	34	34
35	44	46	45	45
40	56	56	56	56
45	69	66	67	67
50	81	76	78	78
55	93	85	90	90
60	106	94	100	100
65	117	102	111	111
70	129	109	120	120
75	139	115	129	129
80	149	121	137	137
85	158	126	145	145
90	166	130	152	152
95	174	134	157	157
100	180	136	163	163

Table 7 – Growth curve values (merchantable volume in m³/ha) on fallow woodland with softwood, mixed or hardwood forest cover based on bioclimatic subdomains and potential vegetation groups

Bioclimatic subdomains	1	2 East	2 West	3 East	3 West
Potential vegetation groups	MJ_	MJ_	MJ_	MJ_	MJ_
Age	Merchantable volume (m³/ha)			Merchantable volume (m³/ha)	
1	0	0	0	0	0
5	1	1	1	1	1
10	4	4	4	6	5
15	9	10	9	12	12
20	17	18	17	21	20
25	26	27	26	31	31
30	37	38	37	42	42
35	48	50	48	54	54
40	61	62	61	66	66
45	74	75	74	78	79
50	87	88	87	90	91
55	100	101	100	102	104
60	113	114	113	113	115
65	125	127	125	124	126
70	137	138	137	134	137
75	148	150	148	143	146
80	159	160	159	152	155
85	168	170	168	160	163
90	177	179	177	167	170
95	185	188	185	173	177
100	192	195	192	179	182

Table 8 – Growth curve values (merchantable volume in m³/ha) on fallow woodland with softwood, mixed or hardwood forest cover based on bioclimatic subdomains and potential vegetation groups

Bioclimatic subdomains	4 East	4 West	5 East	5 West
Potential vegetation groups	MJ_	MJ_	MJ_	MJ_
Age	Merchantable volume (m³/ha)		Merchantable volume (m³/ha)	
1	0	0	0	0
5	1	1	1	1
10	3	5	4	4
15	8	10	9	9
20	14	18	16	16
25	23	27	24	24
30	33	36	34	34
35	44	46	45	45
40	56	56	56	56
45	68	66	67	67
50	80	76	78	78
55	93	85	90	90
60	105	94	100	100
65	117	102	111	111
70	128	109	120	120
75	139	115	129	129
80	149	121	137	137
85	158	126	145	145
90	166	130	152	152
95	173	134	157	157
100	180	136	163	163

Table 9 – Growth curve values (merchantable volume in m³/ha) on fallow woodland with softwood, mixed or hardwood forest cover based on bioclimatic subdomains and potential vegetation groups

Bioclimatic subdomains	1	2 East	2 West	3 East	3 West
Potential vegetation groups	MS_	MS_	MS_	MS_	MS_
Age	Merchantable volume (m³/ha)			Merchantable volume (m³/ha)	
1	0	0	0	0	0
5	1	1	1	1	1
10	4	4	4	3	3
15	9	9	9	8	8
20	16	16	16	14	14
25	24	24	24	22	22
30	34	34	34	32	32
35	44	44	44	42	42
40	55	55	55	53	53
45	66	66	66	64	64
50	77	77	77	75	75
55	87	87	87	85	85
60	97	97	97	95	95
65	106	106	106	104	104
70	114	114	114	113	113
75	122	122	122	121	121
80	128	128	128	127	127
85	134	134	134	133	133
90	139	139	139	138	138
95	143	143	143	142	142
100	146	146	146	146	146

Table 10 – Growth curve values (merchantable volume in m³/ha) on fallow woodland with softwood forest cover based on bioclimatic subdomains and potential vegetation groups

Bioclimatic subdomains	4 East	4 West	5 East	5 West
Potential vegetation groups	MS_	MS_	MS_	MS_
Age	Merchantable volume (m³/ha)		Merchantable volume (m³/ha)	
1	0	0	0	0
5	2	0	0	1
10	6	3	2	4
15	11	7	4	10
20	18	14	9	19
25	25	22	15	28
30	33	32	23	39
35	42	42	31	51
40	51	53	41	63
45	59	64	52	74
50	68	74	63	85
55	77	85	74	95
60	86	94	85	104
65	94	103	96	113
70	102	111	106	120
75	110	118	116	126
80	117	124	125	131
85	124	128	134	135
90	131	132	142	139
95	137	136	149	141
100	143	138	155	142

Table 11 – Growth curve values (merchantable volume in m³/ha) on fallow woodland with softwood, mixed or hardwood forest cover based on bioclimatic subdomains and potential vegetation groups

Bioclimatic subdomains	1	2 East	2 West	3 East	3 West
Potential vegetation groups	RB_	RB_	RB_	RB_	RB_
Age	Merchantable volume (m³/ha)			Merchantable volume (m³/ha)	
1	0	0	0	0	0
5	1	1	1	1	1
10	4	4	4	3	3
15	9	9	9	8	8
20	16	16	16	14	14
25	24	24	24	22	22
30	34	34	34	32	32
35	44	44	44	42	42
40	55	55	55	53	53
45	66	66	66	64	64
50	77	77	77	75	75
55	87	87	87	85	85
60	97	97	97	95	95
65	106	106	106	104	104
70	114	114	114	113	113
75	122	122	122	121	121
80	128	128	128	127	127
85	134	134	134	133	133
90	139	139	139	138	138
95	143	143	143	142	142
100	146	146	146	146	146

Table 12 – Growth curve values (merchantable volume in m³/ha) on fallow woodland with softwood forest cover based on bioclimatic subdomains and potential vegetation groups

Bioclimatic subdomains	4 East	4 West	5 East	5 West
Potential vegetation groups	RB_	RB_	RB_	RB_
Age	Merchantable volume (m³/ha)		Merchantable volume (m³/ha)	
1	0	0	0	0
5	2	0	0	1
10	6	3	2	4
15	11	7	4	10
20	18	14	9	19
25	25	22	15	28
30	33	32	23	39
35	42	42	31	51
40	51	53	41	63
45	59	64	52	74
50	68	74	63	85
55	77	85	74	95
60	86	94	85	104
65	94	103	96	113
70	102	111	106	120
75	110	118	116	126
80	117	124	125	131
85	124	128	134	135
90	131	132	142	139
95	137	136	149	141
100	143	138	155	142

Table 13 – Growth curve values (merchantable volume in m³/ha) on fallow woodland with softwood, mixed or hardwood forest cover based on bioclimatic subdomains and potential vegetation groups

Bioclimatic subdomains	1	2 East	2 West	3 East	3 West
Potential vegetation groups	RS_	RS_	RS_	RS_	RS_
Age	Merchantable volume (m³/ha)			Merchantable volume (m³/ha)	
1	0	0	0	0	0
5	0	0	0	0	0
10	2	2	2	1	1
15	5	5	5	4	4
20	10	10	10	7	7
25	16	16	16	13	13
30	24	24	24	19	19
35	32	32	32	27	27
40	42	42	42	35	35
45	52	52	52	44	44
50	62	62	62	54	54
55	73	73	73	64	64
60	83	83	83	75	75
65	94	94	94	85	85
70	104	104	104	95	95
75	114	114	114	105	105
80	123	123	123	114	114
85	132	132	132	123	123
90	140	140	140	132	132
95	148	148	148	140	140
100	155	155	155	147	147

Table 14 – Growth curve values (merchantable volume in m³/ha) on fallow woodland with mixed or hardwood forest cover based on bioclimatic subdomains and potential vegetation groups

Bioclimatic subdomains	4 East	4 West	5 East	5 West
Potential vegetation groups	RS_	RS_	RS_	RS_
Age	Merchantable volume (m³/ha)		Merchantable volume (m³/ha)	
1	0	0	0	0
5	0	0	0	0
10	2	1	1	1
15	6	3	3	3
20	11	7	6	7
25	18	12	11	13
30	26	19	18	21
35	35	27	26	31
40	45	36	35	43
45	56	46	45	56
50	67	57	56	70
55	78	68	67	84
60	89	79	78	97
65	100	89	90	111
70	110	99	101	123
75	120	109	112	135
80	130	118	122	145
85	138	126	132	154
90	147	133	141	162
95	154	139	149	168
100	161	145	157	173

Table 15 – Growth curve values (merchantable volume in m³/ha) on fallow woodland with softwood, mixed or hardwood forest cover based on bioclimatic subdomains and potential vegetation groups

Bioclimatic subdomains	1	2 East	2 West	3 East	3 West
Potential vegetation groups	RE_	RE_	RE_	RE_	RE_
Age	Merchantable volume (m³/ha)			Merchantable volume (m³/ha)	
1	0	0	0	0	0
5	0	0	0	0	0
10	2	2	2	1	1
15	5	5	5	4	4
20	10	10	10	7	7
25	16	16	16	13	13
30	24	24	24	19	19
35	32	32	32	27	27
40	42	42	42	35	35
45	52	52	52	44	44
50	62	62	62	54	54
55	73	73	73	64	64
60	83	83	83	75	75
65	94	94	94	85	85
70	104	104	104	95	95
75	114	114	114	105	105
80	123	123	123	114	114
85	132	132	132	123	123
90	140	140	140	132	132
95	148	148	148	140	140
100	155	155	155	147	147

Table 16 – Growth curve values (merchantable volume in m³/ha) on fallow woodland with mixed or hardwood forest cover based on bioclimatic subdomains and potential vegetation groups

Bioclimatic subdomains	4 East	4 West	5 East	5 West
Potential vegetation groups	RE_	RE_	RE_	RE_
Age	Merchantable volume (m³/ha)		Merchantable volume (m³/ha)	
1	0	0	0	0
5	0	0	0	0
10	1	1	1	1
15	3	3	3	2
20	6	7	6	6
25	11	12	11	10
30	17	19	18	17
35	24	27	26	25
40	32	36	35	34
45	41	46	45	44
50	50	57	56	55
55	60	67	67	66
60	70	78	78	78
65	80	88	90	89
70	89	98	101	100
75	99	108	112	110
80	108	116	122	120
85	117	124	132	129
90	125	131	141	136
95	132	138	149	143
100	139	143	157	149

Table 17– Growth curve values (merchantable volume in m³/ha) on fallow woodland with softwood, mixed or hardwood forest cover based on bioclimatic subdomains and potential vegetation groups

Bioclimatic subdomains	1	2 East	2 West	3 East	3 West
Potential vegetation groups	RS1	RS1	RS1	RS1	RS1
Age	Merchantable volume (m³/ha)			Merchantable volume (m³/ha)	
1	0	0	0	0	0
5	1	1	1	1	1
10	3	5	5	5	5
15	7	13	13	13	13
20	13	25	25	25	25
25	21	39	39	39	39
30	29	56	56	56	56
35	39	75	75	75	75
40	50	95	95	95	95
45	61	116	116	116	116
50	73	138	138	138	138
55	84	160	160	160	160
60	96	181	181	181	181
65	107	202	202	202	202
70	117	222	222	222	222
75	127	241	241	241	241
80	137	259	259	259	259
85	146	276	276	276	276
90	154	292	292	292	292
95	161	306	306	306	306
100	168	318	318	318	318

Table 18 – Growth curve values (merchantable volume in m³/ha) on fallow woodland with softwood, mixed or hardwood forest cover based on bioclimatic subdomains and potential vegetation groups

Bioclimatic subdomains	4 East	4 West	5 East	5 West
Potential vegetation groups	RS1	RS1	RS1	RS1
Age	Merchantable volume (m³/ha)		Merchantable volume (m³/ha)	
1	0	0	0	0
5	0	0	0	0
10	2	2	1	1
15	5	5	2	2
20	10	10	5	5
25	18	18	9	9
30	27	27	14	14
35	39	39	19	19
40	51	51	25	25
45	64	64	32	32
50	78	78	39	39
55	93	93	46	46
60	107	107	53	53
65	121	121	60	60
70	135	135	67	67
75	147	147	74	74
80	159	159	80	80
85	170	170	85	85
90	180	180	90	90
95	189	189	95	95
100	197	197	99	99

Table 19 – Growth curve values (merchantable volume in m³/ha) on fallow shrubland based on bioclimatic subdomains and potential vegetation groups

Bioclimatic subdomains	1 / 2 East /2 West / 3 East /3 West/ 4 East / 4 West / 5 East /5 West
Potential vegetation groups	FE_/ MJ_/ MS_ /RB_/ RS_ /RE_ /RS1
Age	Merchantable volume (m³/ha)
1	0
5	0
10	1
15	1
20	2
25	2
30	3
35	4
40	5
45	5
50	6
55	7
60	8
65	9
70	10
75	11
80	12
85	13
90	14
95	15
100	16

Table 20 – Growth curve values (merchantable volume in m³/ha) on fallow grassland based on bioclimatic subdomains and potential vegetation groups

Bioclimatic subdomains	1 / 2 East /2 West / 3 East /3 West/ 4 East / 4 West / 5 East /5 West
Potential vegetation groups	FE_/ MJ_/ MS_ /RB_/ RS_ /RE_ /RS1
Age	Merchantable volume
1	0
5	1
10	1
15	1
20	1
25	2
30	2
35	2
40	2
45	2
50	2
55	3
60	3
65	3
70	3
75	3
80	3
85	4
90	4
95	4
100	4

SCHEDULE E – Conversion of anhydrous biomass in each plant stratum into merchantable volume

(s. 40)

DIVISION I
TABLE FOR THE CONVERSION OF ANHYDROUS BIOMASS ON FALLOW WOODLAND INTO MERCHANTABLE VOLUME

1.   For the purposes of this Division,

"Ecozone 7" and "Ecozone 8" mean the ecozones representing the ecological subdivisions in the MBC- SCF software;

"BOP" means white birch;

"PET" means trembling aspen;

"EPB" means white spruce;

"TMA" means anhydrous metric tonne.

Ecozone 7			Ecozone 8			
BOP	**PET**	**EPB**	**BOP**	**PET**	**EPB**	
Biomass (TMA)	Biomass (TMA)	Biomass (TMA)	Biomass (TMA)	Biomass (TMA)	Biomass (TMA)	Merchantable volume m³/ha
0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.8	1.1	1.5	0.8	1.0	1.5	0.5
3.1	2.0	2.7	1.5	1.9	2.8	1.0
4.3	2.7	3.8	2.2	2.6	4.1	1.5
5.4	3.5	4.8	2.9	3.3	5.9	2.0
6.4	4.2	5.8	3.6	4.0	8.1	2.5
7.3	4.9	6.7	4.2	4.7	10.9	3.0
8.2	5.6	7.7	4.9	5.4	14.0	3.5
9.1	6.3	8.6	5.6	6.1	17.3	4.0
10.0	7.1	9.5	6.2	6.8	20.6	4.5
10.9	7.8	10.4	6.9	7.5	23.8	5.0
11.7	8.6	11.2	7.5	8.3	26.7	5.5
12.5	9.4	12.0	8.1	9.0	29.2	6.0
13.3	10.1	12.9	8.7	9.8	31.3	6.5
14.1	10.9	13.7	9.3	10.5	33.0	7.0
14.9	11.6	14.4	9.9	11.2	34.4	7.5
15.6	12.3	15.2	10.5	11.9	35.3	8.0
16.4	13.0	16.0	11.0	12.6	36.0	8.5
17.1	13.7	16.7	11.6	13.3	36.4	9.0
17.8	14.3	17.5	12.1	13.9	36.7	9.5

18.5	15.0	18.2	12.6	14.6	36.7	10.0
19.3	15.6	19.0	13.2	15.2	36.6	10.5
20.0	16.2	19.7	13.7	15.8	36.4	11.0
20.7	16.8	20.4	14.2	16.4	36.2	11.5
21.3	17.4	21.1	14.7	17.0	35.9	12.0
22.0	18.1	21.9	15.2	17.6	35.7	12.5
22.7	18.7	22.6	15.7	18.2	35.4	13.0
23.4	19.3	23.3	16.2	18.8	35.1	13.5
24.0	19.9	23.9	16.7	19.4	34.9	14.0

DIVISION II
EQUATIONS USED TO CONVERT ANHYDROUS BIOMASS ON FALLOW SHRUBLAND OR GRASSLAND INTO MERCHANTABLE VOLUME

1. The following equations must be used to convert total anhydrous biomass (t) on fallow shrubland or grassland that includes below-ground and epigeal biomass into merchantable volume brut (m³):

$$\text{Équation 1}: Volume_{herbacée}(m^3) = 0.0013x^2 + 0.3253x$$

$$\text{Équation 2}: Volume_{arbustive}\ (m^3) = 0.0032x^2 + 0.6891x$$

Where:

x: anhydrous biomass in metric tonnes

SCHEDULE F – Simulation of the carbon present in timber forest products – determination of the parameters "$I_{(t)}$", "k" and "e^{-k}" in equation 6

(ss. 45, 46)

DIVISION I
VALUE OF PARAMETER "$I_{(t)}$"

1.   Unless modified by the promoter, the value of the parameter $I_{(t)}$ in equation 6 is determined using the table below. The parameter corresponds to the provincial distribution rate for the volumes of timber harvested by type of timber forest product.

Value of parameter "$I_{(t)}$" in equation 6											
Timber forest product	**Age of stand**										
	0	10	20	30	40	50	60	70	80	90	100
Sawwood	Na	Na	Na	0.19	0.43	0.49	0.52	0.44	0.60	0.64	0.58
Particle board *	Na	Na	Na	0.02	0.06	0.07	0.07	0.07	0.07	0.07	0.07
Veneer and plywood *	Na	Na	Na	0.02	0.06	0.07	0.07	0.07	0.07	0.07	0.07
Pulp and paper, cardboard	Na	Na	Na	0.68	0.44	0.38	0.35	0.42	0.28	0.25	0.30
Energy products (granules, logs, biofuels, etc.)	Na	Na	Na	0.11	0.07	0.06	0.06	0.07	0.05	0.04	0.05
* The products "particle board" and "plywood" are mutually exclusive. The promoter must determine which of the two matches the reality of the project.											

DIVISION II
VALUE OF PARAMETERS "k" AND "e^{-K}"

1.　　　The value of parameters k and e^{-k} in equation 6 in section 46 is determined using the table below. The parameters are used to define the annual change in carbon stock in various categories of timber forest products.

Value of variables k and e^{-k} in equation 6			
Timber forest product	**k**	**e^{-k}**	**Half-life**
Sawwood	0.02	0.98	35
Particle board	0.03	0.97	20
Plywood	0.03	0.97	20
Pulp and paper	0.28	0.76	2,5
Biomass energy	0.69	0.50	1

SCHEDULE G – Elements to be taken into account when verifying the measures taken by a promoter during the initial inventory and issuance inventory

(ss. 83, 89, 93 and 100)

1.   The table in this Schedule presents the elements to be taken into account by the verifier when verifying the project plan and project report with respect to the measures taken during the initial inventory and issuance inventory.

In addition to these elements, the verifier must define the soil colour using a Munsell soil colour chart and a soil sample taken at a distance of 10 centimetres from where the promoter took soil samples. The soil sample must be taken using the methodology prescribed for the taking of samples by the promoter.

2.   For the purposes of the table in this Schedule,

"DiN" means the difference between the number of stems inventoried by the promoter (NbtigeP) and the number of stems inventoried by the verifier (NbtigeV), as an absolute value;

"DiE" means the sum of the differences between the number of stems inventoried by the promoter and the number of stems inventoried by the verifier for each species, as an absolute value;

"DiD" means the sum of the differences between the number of stems inventoried by the promoter and the number of stems inventoried by the verifier for diameter class, as an absolute value;

"P" means a promoter;

"V" means a verifier.

Subject	Accepted deviations and errors	Attributed errors	Possible errors	Tolerance limit (%)
Lot / Sample plot				
Surface area of strata (map verification)	Deviation ≤ ± 5% Deviation > ± 5%	0 1	Number of strata	5%
Positioning of sample plot (in the field – with satellite geolocation; if the sample plot has not moved compared to the survey plan)	Distance ≤ ± 10 m Distance > 10 m	0 1	Number of sample plots	9%

Positioning of the sample plot group (in the field with satellite geolocation; if the sample plot has not moved compared to the survey plan)	Distance ≤ ± 50 cm Distance > 50 cm	0 1	Number of sample plots	18%
Regeneration - Coefficient of distribution				
Number of stems	DiN = |NbtigeP – NbtigeV|	DiN	Maximum of total of P or total of V	12%
Number of stems per species	DiE = |NbtigeP – NbtigeV| (by species)	(DiE–DiN) /2	Minimum of total of P or total of V	9%
Trees > 130 cm in height (commercial)				
Number of stems by species	DiE = |NbtigeP – NbtigeV| (by species)	(DiE – DiN) /2	Minimum of total of P or total of V	8%
Height (three (3) dominant, codominant, intermediate trees per sample plot)	In softwoods Deviation ≤ 1 m Deviation > 1 m In hardwoods Deviation ≤ 10% Deviation > 10%	0 1 0 1	Total number of observations	8%
Number of stems	DiN = |NbtigeP – NbtigeV|	DiN	Maximum of total of P or total of V	8%
Number of stems per DBH class (2 cm classes)	DiD = |NbtigeP – NbtigeV| (per DBH class)	(DiD – DiN) /2	Minimum of total of P or total of V	8%
Shrub strata > 130 cm in height (non-commercial)				
Number of stems	DiN = |NbtigeP – NbtigeV|	DiN	Maximum of total of P or total of V	15%

Number of stems by species	DiE = |NbtigeP − NbtigeV| (by species)	(DiE − DiN) /2	Minimum of total of P or total of V	15%
DSH height (2 cm)	DiD = |NbtigeP − NbtigeV| (per DBH class)	(DiD − DiN) /2	Minimum of total of P or total of V	15%
Stratum of grass, moss, seedling, and trees below 130 cm in height				
Cover class (25% classes)	Same Different	0 1	Total number of observations	10%
Snags				
Number of snags	DiN = |NbtigeP − NbtigeV|	DiN	Maximum of total of P or total of V	15%
Number of snags by condition class	Same Different	0 1	Total number of observations	10%
Soil				
Volume of sample (measured in the laboratory)	More than 100 cm^3 Less than 100 cm^3	1 0	Total number of observations	0%
Stoniness class	Same Different	0 1	Total number of observations	0%
Positioning of sub-sample	Distance ≤ ± 50 cm Distance > 50 cm	0 1	Total number of observations	10%

SCHEDULE H – Fossil fuel consumption factors per hectare based on family of silvicultural treatment

(s. 57 and 70)

Family of silvicultural treatment	Consumption factor (litres/ha)	Fossil fuel
Site preparation	107.6	Diesel
Planting of seedlings	28.5	Gasoline*
Stand tending	34.3	Gasoline*
Commercial thinning of softwoods	504.2	Diesel
Partial cut of hardwoods	420.8	Diesel
Clearcut of hardwoods	796.3	Diesel
Partial cut of softwoods	491.5	Diesel
Clearcut of softwoods	1019.1	Diesel

* "Gasoline" includes both "Regular" and "Premium" gasoline.

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