Carbon Credits (Carbon Farming Initiative—Avoided Clearing of Native Regrowth) Methodology Determination 2015

I, Greg Hunt, Minister for the Environment, make the following determination.

Dated 13 February 2015

GREG HUNT

Greg Hunt
Minister for the Environment

Contents

Part 1 —Preliminary 4

1 Name 4
2 Commencement 4
3 Authority....4
4 Duration....4
5 Definitions 4

Part 2 — Avoided clearing projects 8

6 Avoided clearing projects 8

Part 3 —Project requirements 9

Division 1 —Eligible projects 9

7 General 9

Division 2 —Land on which the avoided clearing project is carried out 9

8 General 9
9 Native forest cover....9
10 Native forest cover—evidence....9
11 Unrestricted clearing permitted....9
12 Unrestricted clearing permitted—evidence....10
13 Clearing history 10
14 Clearing history—evidence 10
15 Regeneration after clearing events—evidence 10
16 Land use history....11
17 Land use history—evidence....11
18 Excluded forest types....11

Division 3 —Carbon estimation areas 11

Subdivision 1 —Subdivision A Requirement for carbon estimation areas 11

19 General 11

Subdivision 2 —General requirements and boundaries 12

20 General requirements....12
21 Boundaries and mapping 12

Subdivision 3 —Timing of clearing and regeneration 13

22 General 13
23 Regeneration after second most recent clearing event 13
24 Year of most recent clearing event 13
25 Age of forest at most recent clearing event....13
26 Regeneration after most recent clearing event 14
27 Day on which the first baseline clearing event occurs 14

Division 4 —First baseline clearing event 14

28 When the first baseline clearing event must occur....14

Division 5 —Management activities 14

29 Ongoing management....14
30 Removal of biomass from project area 15
31 Thinning 15
32 Use of fertiliser 15

Part 4 —The net abatement amount 16

Division 1 —The net abatement amount 16

33 The net abatement amount....16

Division 2 —FullCAM modelling 16
34 Modelling baseline and project scenario in FullCAM 16
35 Baseline scenario 16
36 Interval between projected events....16
37 Modelling start date and modelling period 16
38 Project scenario....17
39 Adding thinning events to project scenario....17
40 Adding fire events to project scenario 17
41 Adding non-fire natural disturbances to project scenario....18
42 Adding regeneration events to the project scenario 18
43 Running baseline and project scenarios in FullCAM....19
Division 3 —Calculations—preliminary 19
44 Calculating the net abatement amount....19
45 References to factors and parameters from external sources 19
46 Greenhouse gas assessment boundary 19
47 FullCAM outputs....20
Division 4 —Calculations 21
Subdivision 1 —Calculation of carbon stock change in the project area over each reporting period 21
48 Calculating long-term average baseline carbon stock for carbon estimation area....21
49 Calculating carbon stock for carbon estimation area at the end of reporting period 21
50 Calculating carbon stock change in each carbon estimation area at end of the first reporting period....22
51 Calculating carbon stock change for carbon estimation area at end of second and subsequent reporting periods....22
52 Calculating carbon stock change in the project area at the end of a reporting period 22
Subdivision 2 —Emissions from project area at the end of each reporting period 23
53 Calculating methane and nitrous oxide emissions from biomass burning....23
Subdivision 3 —Calculation of the carbon dioxide equivalent net abatement amount 24
54 Calculating the carbon dioxide equivalent net abatement amount for a project....24
Part 5 —Reporting, record-keeping and monitoring requirements 26
Division 1 —Offsets report requirements 26
55 Operation of this Division....26
56 Information in each offsets report....26
Division 2 —Record-keeping 26
57 Operation of this Division....26
58 Records that must be created and kept....26
Division 3 —Monitoring 27
59 Operation of this Division....27
60 Project monitoring 27
Part 6 —Reporting under section 77A of the Act 28
61 No division of carbon estimation area 28

Part 1—Preliminary

1 Name

This is the *Carbon Credits (Carbon Farming Initiative—Avoided Clearing of Native Regrowth) Methodology Determination 2015*.

2 Commencement

This instrument commences on the day after it is registered.

3 Authority

This instrument is made under subsection 106(1) of the *Carbon Credits (Carbon Farming Initiative) Act 2011*.

4 Duration

This instrument remains in force for the period that:

(a) begins when this instrument commences; and

(b) ends on the day before this instrument would otherwise be repealed under subsection 50(1) of the *Legislative Instruments Act 2003*.

5 Definitions

In this instrument:

above ground biomass means all live material in a tree above the level of mineral earth and includes the stem and crown.

Act means the Carbon Credits (Carbon Farming Initiative) Act 2011.

avoided clearing project has the meaning given by section 6.

baseline scenario has the meaning given by section 35.

below ground biomass means all live material in a tree below the level of mineral earth and includes the tap root or lignotuber, and the lateral roots.

biomass means dry, vegetation-derived organic matter.

C means carbon.

C mass of biomass on-site means the sum of the carbon stock within each carbon pool that is included in the greenhouse gas assessment boundary specified in section 46.

C mass of trees means the carbon in above and below ground biomass of live trees.

carbon estimation area means an area or areas of land in the project area in respect of which the baseline scenario and project scenario are modelled in FullCAM.

Carbon Farming Mapping Tool means the online mapping tool of that name, as published from time to time on the Department's website.

carbon pool means above ground biomass, below ground biomass or debris.

carbon stock of an area of land, at a specified time, means the quantity of carbon held within the area at that time as:

(a) above ground biomass; and

(b) below ground biomass; and

(c) debris.

carbon stock change means the change or difference in quantity of carbon stock over a specified time and expressed in units of mass.

CFI Mapping Guidelines means the guidelines of that name, as published from time to time on the Department's website, to be used for mapping project areas and carbon estimation areas.

clearing event means the removal of forest cover from land through the destruction of trees or saplings, or both, by mechanical or chemical means, whether or not accompanied by use of fire.

CO_2-e means carbon dioxide equivalent.

debris means above ground and below ground dead plant material.

derived vegetation cover data means satellite or aerial imagery that has been processed to show vegetation cover or other relevant vegetation attributes.

environmental planting means a planting that consists of species that:

(a) are native to the local area of the planting; and

(b) are sourced from seeds:

(i) from within the natural distribution of the species; and

(ii) that are appropriate to the biophysical characteristics of the area of the planting; and

(c) may be a mix of trees, shrubs, and understorey species where the mix reflects the structure and composition of the local native vegetation community.

forest means land of a minimum area of 0.2 of a hectare on which trees:

(a) have attained, or have the potential to attain, a crown cover of at least 20% across the area of land; and

(b) have reached, or have the potential to reach, a height of at least 2 metres.

forest cover—land has ***forest cover*** if the land is dominated by trees that:

(a) have attained a crown cover of at least 20% of the area of land; and

(b) have reached a height of at least 2 metres.

FullCAM means the latest publicly released version on the Department's website of the Full Carbon Accounting Model used to model forest carbon stocks associated with land use and management for Australia's National Greenhouse Gas Inventory, and includes related databases and spatial inputs used by FullCAM for its calculations.

Note The Department's website is www.environment.gov.au.

FullCAM Guidelines means the guidelines of that name as published from time to time on the Department's website.

model point location means the location of a model point, identified by latitude and longitude, for use in FullCAM.

modelling start date has the meaning given by section 37.

modelling period has the meaning given by section 37.

native forest means an area of land that:

(a) is dominated by trees that:
  (i) are located within their natural range; and
  (ii) have attained, or have the potential to attain, a crown cover of at least 20% of the area of land; and
  (iii) have reached, or have the potential to reach, a height of at least 2 metres; and

(b) is not a plantation.

native forest cover—land has ***native forest cover*** if the land is dominated by trees that:

(a) are located within their natural range; and

(b) have attained a crown cover of at least 20% of the area of land; and

(c) have reached a height of at least 2 metres.

NGER Regulations means the *National Greenhouse and Energy Reporting Regulations 2008*.

plantation means a forest established for harvest.

project scenario has the meaning given by section 38.

regeneration means the regrowing of native forest and tree stems from in-situ:

(a) seed; or

(b) rootstock; or

(c) lignotuber sources.

remotely-sensed imagery includes satellite imagery and aerial photography.

thinning means the selective killing of trees for ecological purposes, including to maintain species diversity or ground cover.

tree means a perennial plant that has primary supporting structures consisting of secondary xylem.

unrestricted clearing has the meaning given by section 11.

windrow and burn fire means the burning of debris heaped into windrows following a clearing event.

Note Other words and expressions used in this determination have the meaning given by the Act. These include:

carbon dioxide equivalent

eligible carbon abatement

eligible offsets project

emission

greenhouse gas

natural disturbance

offsets project

offsets report

project

project area

project proponent

Regulator

reporting period.

Part 2—Avoided clearing projects

6 Avoided clearing projects

(1) For paragraph 106(1)(a) of the Act, this determination applies to a sequestration offsets project that:

(a) avoids emissions by not clearing native forest; and

(b) meets the eligibility requirements in Part 3; and

(c) results in eligible carbon abatement; and

(d) has not been an eligible offsets project under the *Carbon Credits (Avoided Deforestation) Methodology Determination 2013*.

(2) A project covered by subsection (1) is an ***avoided clearing project***.

Part 3—Project requirements

Division 1—Eligible projects

7 General

For paragraph 106(1)(b) of the Act, to be an eligible offsets project, an avoided clearing project must meet the requirements in this Part.

Division 2—Land on which the avoided clearing project is carried out

8 General

Every part of the land on which an avoided clearing project is carried out must meet the requirements of sections 9, 11, 13, 16 and 18.

9 Native forest cover

At the time of the application under section 22 of the Act, the land must:

(a) have native forest cover; and

(b) be substantially uniformly covered in trees.

10 Native forest cover—evidence

(1) The project proponent must provide the Regulator with evidence that the land:

(a) has native forest cover; and

(b) is substantially uniformly covered in trees.

(2) The evidence must include the following:

(a) a list of the dominant tree species present on the land;

(b) written evidence that the dominant tree species are within their natural range.

(3) The evidence may include the following:

(a) remotely-sensed imagery;

(b) the most recent forest cover data layer shown in the Carbon Farming Mapping Tool.

(4) Any remotely-sensed imagery must be:

(a) date-stamped; and

(b) of sufficient quality to identify forest cover.

11 Unrestricted clearing permitted

(1) At the time of the application under section 22 of the Act, unrestricted clearing must be permitted on the land.

(2) In this determination, ***unrestricted clearing*** is permitted on land if the clearing of trees is permitted without restriction.

(3) For subsection (2), without limitation, clearing is permitted without restriction if clearing is permitted without:

(a) a requirement that a species cannot be removed from the land; or

(b) a requirement for an offset to mitigate any effect from the clearing of the land.

12 Unrestricted clearing permitted—evidence

(1) The project proponent must provide the Regulator with evidence that, at the time of the application under section 22 of the Act, unrestricted clearing is permitted on the land.

(2) The evidence must include one of the following:
   (a) a valid clearing permit;
   (b) evidence that the land may be unrestrictedly cleared without a permit.

13 Clearing history

At least 2 clearing events must have occurred on the land.

14 Clearing history—evidence

(1) The project proponent must provide the Regulator with evidence of the 2 most recent clearing events in each carbon estimation area.

Note For example, if a carbon estimation area was cleared in 1960, 1974, 1982, 1991 and 2005, the 2 most recent clearing events are the clearing events in 1991 and 2005.

(2) The evidence must consist of:
   (a) if the project proponent has evidence of the calendar year in which a clearing event occurred—that evidence; or
   (b) otherwise—evidence that a clearing event occurred at some point over a period of not more than 3 years.

(3) The evidence may include the following:
   (a) remotely-sensed imagery;
   (b) clearing permits;
   (c) farm management records;
   (d) tax invoices;
   (e) published vegetation mapping;
   (f) derived vegetation cover data.

Note The Regulator may ask for additional evidence if the evidence that is supplied is not sufficient to establish the 2 most recent clearing events.

(4) The Regulator may disregard any remotely-sensed imagery that is:
   (a) not date-stamped; or
   (b) of insufficient quality to identify changes in vegetation cover.

15 Regeneration after clearing events—evidence

(1) The project proponent must provide the Regulator with evidence of regeneration after:
   (a) the second most recent clearing event; and
   (b) the most recent clearing event;

in each carbon estimation area.

(2) The evidence of regeneration after the most recent clearing event must include remotely-sensed imagery.

(3) The remotely-sensed imagery must be:

(a) date-stamped; and
(b) of sufficient quality to identify changes in vegetation cover.

(4) The evidence referred to in subsection (1) must consist of:
(a) if the project proponent has evidence of the calendar year in which regeneration began across the carbon estimation area—that evidence; or
(b) if the project proponent:
(i) does not have the evidence referred to in paragraph (a); and
(ii) has evidence that, over a period that does not exceed 3 years:
(A) there was no regeneration across the carbon estimation area at the start of the period; and
(B) there was regeneration across the carbon estimation area at the end of the period;
that evidence; or
(c) if the project proponent:
(i) does not have evidence referred to in paragraph (a) or paragraph (b); and
(ii) has evidence that, over a period that does not exceed 3 years:
(A) is inconclusive as to whether regeneration had begun across the carbon estimation area by the start of the period; and
(B) demonstrates that there was regeneration across the carbon estimation area at the end of the period;
that evidence.

16 Land use history

The land must have been used for cropping or grazing after each of the 2 most recent clearing events.

17 Land use history—evidence

(1) The project proponent must provide the Regulator with evidence that the land has been used for cropping or grazing after each of the 2 most recent clearing events in each carbon estimation area.

(2) The evidence may include the following:
(a) farm management records;
(b) tax invoices.

18 Excluded forest types

The land must not contain:
(a) plantations; or
(b) environmental plantings.

Division 3—Carbon estimation areas

Subdivision 1—Requirement for carbon estimation areas

19 General

(1) The project proponent must stratify the land on which the avoided clearing project is carried out into carbon estimation areas.

(2) Each carbon estimation area must meet the requirements of this Division.

Subdivision 2—General requirements and boundaries

20 General requirements

(1) Each carbon estimation area must:
  (a) cover an area of land of at least 0.2 of a hectare; and
  (b) contain the same forest type or vegetation community; and
  (c) have the same clearing history, from the second most recent clearing event onwards; and
  (d) have the same regeneration history, from the second most recent clearing event onwards.

Example 1 If area P in the land on which the avoided clearing project is carried out was cleared in 1990 and 2001, and area Q was cleared in the same years, but areas P and Q do not contain the same forest type, then areas P and Q are separate carbon estimation areas.

Example 2 If area P in the land on which the avoided clearing project is carried out was cleared in 1990 and 2001, and area Q was cleared in 1990 and 1999, then areas P and Q are separate carbon estimation areas.

Example 3 If area P in the land on which the avoided clearing project is carried out was cleared in 1990 and 2001, and area Q was cleared in the same years, but regeneration in areas P and Q occurred in different years, then areas P and Q are separate carbon estimation areas.

(2) A carbon estimation area may comprise:
  (a) a single area of land; or
  (b) provided the requirement in subsection (3) is met—separate areas of land.

(3) If a carbon estimation area comprises separate areas of land—the separate areas must not be more than 250 metres apart at their closest point.

Example If a carbon estimation area is divided by a river and a riparian buffer where clearing is not permitted, then the separate areas of land on either side of the river must not be more than 250 metres apart. If those areas are more than 250 metres apart, they must be defined as separate carbon estimation areas.

(4) Each carbon estimation area must contain a model point location at the approximate centre of the carbon estimation area.

(5) The model point location must be within the boundaries of the carbon estimation area.

(6) To avoid doubt, the land in each carbon estimation area must separately meet the requirements in Division 2.

21 Boundaries and mapping

(1) The geographic boundaries of each carbon estimation area must be defined:
  (a) in accordance with the CFI Mapping Guidelines; and
  (b) using at least one of the following:
    (i) field surveys;
    (ii) soil, vegetation or landform maps;
    (iii) remotely-sensed imagery.

(2) Any remotely-sensed imagery must be:
  (a) date-stamped; and

(b) geo-referenced.

(3) The project proponent must provide the Regulator with a map showing each carbon estimation area in the project area.

Subdivision 3—Timing of clearing and regeneration

22 General

For each carbon estimation area, the project proponent must determine:

(a) the year in which the forest began to regenerate across the carbon estimation area after the second most recent clearing event; and

(b) the year in which the most recent clearing event occurred; and

(c) the age of the forest at the most recent clearing event; and

(d) the date on which the forest began to regenerate across the carbon estimation area after the most recent clearing event; and

(e) the day on which the first baseline clearing event occurs;

in accordance with the requirements of this Subdivision.

23 Regeneration after second most recent clearing event

For paragraph 22(a), the year is:

(a) if the evidence relating to paragraph 15(1)(a) consists of evidence referred to in paragraph 15(4)(a)—the calendar year referred to in that paragraph; and

(b) if the evidence relating to paragraph 15(1)(a) consists of evidence referred to in paragraph 15(4)(b) or (c)—the calendar year in which the period referred to in whichever of those paragraphs is relevant ends.

Example If the project proponent has a satellite image from 1996 showing no regeneration and another image from 1998 showing regeneration, then the forest began to regenerate in 1998, i.e. in the last year of the 3 year period 1996 to 1998.

24 Year of most recent clearing event

For paragraph 22(b), the year is:

(a) if the evidence of the most recent clearing event consists of evidence referred to in paragraph 14(2)(a)—the calendar year referred to in that paragraph; or

(b) if the evidence of the most recent clearing event consists of evidence referred to in paragraph 14(2)(b)—the calendar year in which that period ends.

25 Age of forest at most recent clearing event

For paragraph 22(c), the age of the forest at the most recent clearing event is the year in which the most recent clearing event occurred—from section 24—minus the year in which it began to regenerate after the second most recent clearing event—from section 23.

Example If the forest was most recently cleared in 1998 and began to regenerate in 1987 after the second most recent clearing event in 1985, then the age at which the forest was most recently cleared is 11 years (1998 minus1987).

26 Regeneration after most recent clearing event

For paragraph 22(d), the date is:

(a) if the evidence relating to paragraph 15(1)(b) consists of evidence referred to in paragraph 15(4)(a)— 1 January of the calendar year referred to in that paragraph; and

(b) if the evidence relating to paragraph 15(1)(b) consists of evidence referred to in paragraph 15(4)(b) or (c)— 1 January of the calendar year in which the period referred to in whichever of those paragraphs is relevant ends.

Example If the project proponent has a satellite image from 1996 showing no regeneration and another image from 1998 showing regeneration, then the forest began to regenerate in 1998, i.e. in the last year of the 3 year period 1996 to 1998.

27 Day on which the first baseline clearing event occurs

(1) For paragraph 22(e), the first baseline clearing event occurs on 1 January in the year in which the forest reaches the age at which it was most recently cleared.

(2) For the purposes of subsection (1), the year in which the forest reaches the age at which it was most recently cleared is the year in which the forest began to regenerate after the most recent clearing event—from section 26—plus the age at which the forest was most recently cleared—from section 25.

Example If, after the most recent clearing event in 1998 when it was 17 years old, the forest began to regenerate in 2000, then the first baseline clearing event occurs on 1 January 2017.

Division 4—First baseline clearing event

28 When the first baseline clearing event must occur

(1) The day on which the first baseline clearing event occurs in a carbon estimation area—from section 27—must fall within the period that:

(a) begins on 1 January of the year three years before the application under section 22 of the Act is submitted; and

(b) ends on 1 January of the year three years after the application is submitted.

Example If the application to the Regulator was made on 1 July 2015, the day on which the first baseline clearing event occurs must fall between 1 January 2012 and 1 January 2018.

(2) If the day on which the first baseline clearing event occurs in a carbon estimation area does not fall within the period mentioned in subsection (1), the carbon estimation area must not be included in the avoided clearing project.

Division 5—Management activities

29 Ongoing management

(1) The project proponent must undertake appropriate management activities to reduce the risk of damage to the native forest within the carbon estimation areas from fire, weeds and feral animals.

(2) Without limiting subsection (1), appropriate management activities must include any management activities required by a law of the Commonwealth, a State or a Territory, or local government.

30 Removal of biomass from project area

(1) Subject to section 29, biomass must not be removed from a carbon estimation area except in accordance with this section.

(2) Up to 10% of fallen timber may be removed from a carbon estimation area in a calendar year for personal use.

(3) In this section:

personal use, of fallen timber, means use that does not involve the sale, or other commercial use, of the timber.

31 Thinning

(1) Trees in a carbon estimation area may be thinned for ecological purposes in accordance with this section.

(2) The biomass resulting from thinning must remain in the carbon estimation area.

(3) Native forest cover must be maintained despite any thinning.

(4) Thinning must not result in a decrease in carbon stocks below the stocks reported for the carbon estimation area in the most recent offsets report.

(5) Thinning events must be included in the FullCAM model of the project scenario.

32 Use of fertiliser

Fertiliser must not be used in a carbon estimation area.

Part 4—The net abatement amount

Division 1—The net abatement amount

33 The net abatement amount

For paragraph 106(1)(c) of the Act, the carbon dioxide equivalent net abatement amount in relation to a reporting period for an avoided clearing project is taken to be the carbon stock change for the total number of carbon estimation areas within the project area when compared to the baseline, less the project emissions.

Division 2—FullCAM modelling

34 Modelling baseline and project scenario in FullCAM

The project proponent must model the baseline and project scenario for each carbon estimation area in FullCAM in accordance with this Division and the FullCAM Guidelines.

35 Baseline scenario

(1) The ***baseline scenario*** is a series of modelled events consisting of:
  (a) projected regeneration events; and
  (b) projected clearing events; and
  (c) projected windrow and burn fires.

Note The projected clearing events include the first baseline clearing event.

(2) The first event in the series is the regeneration event mentioned in section 26.

Note The effect of subsections (2) is that the first event in the (modelled) series corresponds to the most recent (actual) regeneration event in the carbon estimation area.

36 Interval between projected events

(1) The project proponent must model the projected events mentioned in section 35 at intervals determined in accordance with this section.

(2) The interval between projected clearing events is the age at which the forest in the carbon estimation area was most recently cleared—from section 25—plus 2 years.

(3) Each projected regeneration event occurs 2 years after the preceding projected clearing event.

(4) Subsection (2) does not apply to the first regeneration event.

(5) Each projected windrow and burn fire occurs 1 year after the preceding projected clearing event.

Note See the FullCAM Guidelines for instructions on how to model the baseline scenario.

37 Modelling start date and modelling period

(1) The ***modelling start date*** is 1 day before the regeneration event mentioned in section 26.

(2) The ***modelling period*** is the 100 year period beginning on the modelling start date.

Example If the regeneration event is on 1 January 2016, the modelling start date is 31 December 2015 and the modelling period is 31 December 2015 to 31 December 2115.

(3) The modelling start date and period are the same in the baseline and project scenarios.

Note See the FullCAM Guidelines for instructions on how to enter the modelling start date and period into FullCAM.

38 Project scenario

The ***project scenario*** is a series of modelled events consisting of:

(a) the regeneration referred to in section 26; and

(b) any thinning event that occurs, added to the series in accordance with section 39; and

(c) any fire that occurs, added to the series in accordance with section 40; and

(d) any non-fire natural disturbance that occurs, added to the series in accordance with section 41; and

(e) any regeneration event added to the series in accordance with section 42.

39 Adding thinning events to project scenario

(1) If thinning is undertaken in a carbon estimation area, the project proponent must model a thinning event in the project scenario.

(2) The project proponent must enter the date of the thinning event into FullCAM.

(3) If the thinning event occurred over more than 1 day, the project proponent must enter the date on which the thinning event began.

Note For example, if thinning is conducted between 12 July 2017 and 15 August 2017, the date of the thinning is 12 July 2017.

(4) The project proponent must enter an estimate of the proportion of the trees in the carbon estimation area that were killed by the thinning event.

Note 1 See Part 5 for record-keeping requirements for thinning events.

Note 2 See the FullCAM Guidelines for instructions on how to model a thinning event in the project scenario.

40 Adding fire events to project scenario

(1) If a fire occurs in a carbon estimation area, the project proponent must model:

(a) if trees are killed—a 'Wildfire – trees killed' event; or

(b) if no trees are killed—a 'Wildfire – trees not killed' event;

in the project scenario.

Example 1 If a prescribed burn is carried out in a carbon estimation area in order to reduce the risk of severe bushfires, and trees are killed, the project proponent must enter a 'Wildfire – trees killed' event.

Example 2 If a prescribed burn is carried out and trees are not killed, the project proponent must enter a 'Wildfire – trees not killed' event.

Example 3 If a bushfire occurs, and trees are not killed, the project proponent must enter a 'Wildfire – trees not killed' event.

(2) The project proponent must enter the date of each fire into FullCAM.

(3) If the fire occurred over more than 1 day, the project proponent must enter the date on which the fire began.

Example If fire occurred between 12 July 2017 and 15 August 2017, the date of the fire is 12 July 2017.

(4) If the date on which the fire began is not known, the project proponent must enter the day on which the fire was identified.

(5) The project proponent must enter an estimate of the proportion of the carbon estimation area that was affected by the fire.

Note 1 See Part 5 for record-keeping requirements for fire events.

Note 2 See the FullCAM Guidelines for instructions on how to model a fire in the project scenario.

41 Adding non-fire natural disturbances to project scenario

(1) This section applies if a natural disturbance:
  (a) occurs in a carbon estimation area; and
  (b) is not a fire; and
  (c) kills trees; and
  (d) affects more than 5% of the carbon estimation area; and
  (e) reduces crown cover to less than 20%.

(2) The project proponent must model the natural disturbance as a thinning event in the project scenario.

(3) The project proponent must enter the date of the natural disturbance into FullCAM.

(4) If the natural disturbance occurred over more than 1 day, the project proponent must enter the date on which the natural disturbance began.

Note For example, if the natural disturbance occurred between 12 July 2017 and 15 August 2017, the date of the natural disturbance is 12 July 2017.

(5) If the date on which the natural disturbance began is not known, the project proponent must enter the day on which the natural disturbance was identified.

(6) The project proponent must enter an estimate of the proportion of the carbon estimation area that was affected by the natural disturbance.

Note 1 See Part 5 for record-keeping requirements for natural disturbances.

Note 2 See the FullCAM Guidelines for instructions on how to model a natural disturbance in the project scenario.

42 Adding regeneration events to the project scenario

(1) This section applies if a natural disturbance kills all the trees in a carbon estimation area.

(2) In the project scenario, the project proponent may model a regeneration event after the natural disturbance.

(3) The regeneration event occurs on the first day for which there is evidence of regeneration.

(4) The evidence must include:
  (a) remotely-sensed imagery; or
  (b) photography.

(5) The evidence must be date-stamped.

43 Running baseline and project scenarios in FullCAM

The project proponent must run the baseline and project scenario for each carbon estimation area in the final month of each reporting period.

Example If the reporting period is from 1 July 2015 to 30 June 2017, the project proponent must run the baseline and project scenarios in FullCAM in June 2017.

Note See the FullCAM Guidelines for instructions on how to run the baseline and project scenarios.

Division 3—Calculations—preliminary

44 Calculating the net abatement amount

The project proponent must determine the net abatement amount for each reporting period by completing the formulas in this Part.

45 References to factors and parameters from external sources

(1) If a calculation in this Part includes a factor or parameter that is defined or calculated by reference to another instrument or writing, the factor or parameter to be used for a reporting period is the factor or parameter referred to in, or calculated by reference to, the instrument or writing as in force at the end of the reporting period.

(2) Subsection (1) does not apply if:
  (a) the determination specifies otherwise; or
  (b) it is not possible to define or calculate the factor or parameter by reference to the instrument or writing as in force at the end of the reporting period.

46 Greenhouse gas assessment boundary

When making calculations under this Part:
  (a) the carbon pools and events and the corresponding greenhouse gases in Table 1 must be taken into account; and
  (b) no other gases, carbon pools or events may be taken into account.

Table 1: Carbon pools and events accounted for in the abatement calculations

Carbon pool	**Greenhouse gas**
Live above ground biomass	Carbon dioxide (CO_2)
Live below ground biomass	Carbon dioxide (CO_2)
Debris	Carbon dioxide (CO_2)
Event	**Greenhouse gas**
Fire—planned and unplanned	Methane (CH_4) Nitrous oxide (N_2O) Carbon dioxide (CO_2)
Non-fire disturbances	Carbon dioxide (CO_2)
Biomass thinning	Carbon dioxide (CO_2)

47 FullCAM outputs

(1) The output data in Table 2 must be produced using FullCAM in accordance with Division 4 and the FullCAM Guidelines.

(2) The output data in Table 2 must be used when calculating abatement in accordance with this Part.

Table 2: FullCAM output data required for calculating abatement

FullCAM Output	**Scenario**	**Unit**	**Form**	**Parameter**	**Equation**
C mass of trees	Baseline	tonnes C per hectare	Time series (cumulative monthly)	$C_{BT,i,k}$	1
C mass of debris	Baseline	tonnes C per hectare	Time series (cumulative monthly)	$C_{BD,i,k}$	1
C mass of trees	Project	tonnes C per hectare	Time series (cumulative monthly)	$C_{T,i}$	2
C mass of debris	Project	tonnes C per hectare	Time series (cumulative monthly)	$C_{D,i}$	2
CH_4 emitted due to fire	Project	tonnes CH_4 per hectare	Time series (monthly)	$E_{CH_4,i,j}$	6
N_2O emitted due to fire	Project	kg N_2O per hectare	Time series (monthly)	$E_{N_2O,i,j}$	7

Note FullCAM outputs referred to in masses of carbon, methane or nitrous oxide per hectare are converted to tonnes of CO_2-e in the Equations in this Part.

Division 4—Calculations

Subdivision 1—Calculation of carbon stock change in the project area over each reporting period

48 Calculating long-term average baseline carbon stock for carbon estimation area

The long-term average baseline carbon stock for each carbon estimation area is calculated using the following formula:

$C_{B,i} = \frac{\sum_{k=1}^{1200}(C_{BD,i,k} + C_{BT,i,k}) \times S_i}{1200}$	**Equation 1**

Where:

$C_{B,i}$ = long-term average baseline carbon stock (in tonnes C) for the i^{th} carbon estimation area.

$C_{BD,i,k}$ = C mass in debris pool (in tonnes C per hectare) for the i^{th} carbon estimation area in the k^{th} month since the modelling start date—from FullCAM.

$C_{BT,i,k}$ = C mass of trees (in tonnes C per hectare) for the i^{th} carbon estimation area in the k^{th} month since the modelling start date—from FullCAM.

S_i = the area (in hectares) of the i^{th} carbon estimation area.

49 Calculating carbon stock for carbon estimation area at the end of reporting period

The carbon stock in each carbon estimation area at the end of each reporting period is calculated using the following formula:

$C_i = (C_{D,i} + C_{T,i}) \times S_i$	**Equation 2**

Where:

C_i = C mass of biomass on-site (in tonnes C) for the i^{th} carbon estimation area in the last month of the reporting period.

$C_{D,i}$ = C mass in debris pools (in tonnes C per hectare) for the i^{th} carbon estimation area in the last month of the reporting period—from FullCAM.

$C_{T,i}$ = C mass of trees (in tonnes C per hectare) for the i^{th} carbon estimation area in the last month of the reporting period—from FullCAM.

S_i = the area (in hectares) of the i^{th} carbon estimation area.

50 Calculating carbon stock change in each carbon estimation area at end of the first reporting period

The carbon stock change at the end of the first reporting period must be calculated using the following formula:

$\Delta C_i = C_i - C_{B,i}$	**Equation 3**

Where:

ΔC_i = change in C mass onsite (in tonnes C) at end of first reporting period.

C_i = C mass of biomass on-site (in tonnes C) for the i^{th} carbon estimation area in the last month of the reporting period—from Equation 2.

$C_{B,i}$ = long-term average baseline carbon stock (in tonnes C) for the i^{th} carbon estimation area—from Equation 1.

Note ΔC_i can be zero or less than zero because ΔC_i represents a net carbon stock change relative to the baseline ($C_{B,i}$). Zero and negative values for ΔC_i are included in the sum in Equation 5.

51 Calculating carbon stock change for carbon estimation area at end of second and subsequent reporting periods

The carbon stock change over each reporting period after the first reporting period must be calculated for each carbon estimation area using the following formula:

$\Delta C_i = (C_i - C_{RP,i}) - (C_{B,i} - C_{BRP,i})$	**Equation 4**

Where:

ΔC_i = change in C mass onsite (in tonnes C) at end of second and subsequent reporting period.

C_i = C mass of biomass on-site (in tonnes C) for the i^{th} carbon estimation area in the last month of the reporting period—from Equation 2.

$C_{RP,i}$ = the value for C mass of biomass on-site (in tonnes C) for the i^{th} carbon estimation area reported in the previous offsets report.

$C_{B,i}$ = long-term average baseline carbon stock (in tonnes C) for the i^{th} carbon estimation area—from Equation 1.

$C_{BRP,i}$ = the value for the long-term average baseline carbon stock (in tonnes C) for the i^{th} carbon estimation area reported in the previous offsets report.

52 Calculating carbon stock change in the project area at the end of a reporting period

The carbon stock change in the project area at the end of each reporting period must be calculated using the following formula:

$\Delta C_P = \sum_i \Delta C_i$	**Equation 5**

Where:

ΔC_P= carbon stock change onsite (in tonnes C) in the project area at the end of the reporting period.

ΔC_i = change in C mass onsite (in tonnes C) in for the i^{th} carbon estimation area at the end of the reporting period—from Equation 3 or Equation 4.

Note If ΔC_P is less than or equal to zero, project carbon stocks are lower than baseline carbon stocks which means that no abatement occurred.

Subdivision 2—Emissions from project area at the end of each reporting period

53 Calculating methane and nitrous oxide emissions from biomass burning

(1) Emissions of methane (CH_4) due to biomass burning for the reporting period must be calculated using the following formula:

$E_{P,CH_4} = GWP_{CH_4} \times \sum_j \sum_i (E_{CH_4,i,j} \times S_{F,i,j})$	**Equation 6**

Where:

E_{P,CH_4}= emissions of methane (in tonnes CO_2-e) from biomass burning in the project area in the reporting period.

GWP_{CH_4} = global warming potential of methane as specified in the NGER Regulations.

$E_{CH_4,i,j}$= mass of methane (in tonnes per hectare) emitted due to biomass burning in the i^{th} carbon estimation area in the j^{th} month of the reporting period—from FullCAM.

$S_{F,i,j}$= the area burnt (in hectares) in the i^{th} carbon estimation area in the j^{th} month of the reporting period.

(2) Emissions of nitrous oxide (N_2O) due to biomass burning for the reporting period must be calculated using the following formula:

$E_{P,N_2O} = GWP_{N_2O} \times \sum_j \sum_i \frac{E_{N_2O,i,j} \times S_{F,i,j}}{1000}$	**Equation 7**

Where:

E_{P,N_2O}= emissions of nitrous oxide (in tonnes CO_2-e) from biomass burning for the project for the reporting period.

GWP_{N_2O} = global warming potential of nitrous oxide as specified in the

NGER Regulations.

$E_{N_2O,i,j}$ = mass of N_2O (in kilograms per hectare) emitted due to biomass burning in the i^{th} carbon estimation area in the j^{th} month of the reporting period—from FullCAM.

$S_{F,i,j}$ = the area burnt (in hectares) in the i^{th} carbon estimation area in the j^{th} month of the reporting period.

Note While the FullCAM output for N_2O emitted is in kilograms per hectare, Equation 7 includes a factor to convert the result to tonnes CO_2-e.

(3) Total emissions due to biomass burning for the reporting period must be calculated using the following formula:

$E_P = E_{P,CH_4} + E_{P,N_2O}$	**Equation 8**

Where:

E_P = total emissions (in tonnes CO_2-e) from biomass burning for the reporting period.

E_{P,CH_4} = emissions of CH_4 (in tonnes CO_2-e) from biomass burning for the project for the reporting period—from Equation 6.

E_{P,N_2O} = emissions of N_2O (in tonnes CO_2-e) from biomass burning for the project for the reporting period—from Equation 7.

Subdivision 3—Calculation of the carbon dioxide equivalent net abatement amount

54 Calculating the carbon dioxide equivalent net abatement amount for a project

Note See paragraph 106(1)(c) of the Act.

(1) If:

(a) the reporting period is the first reporting period; or

(b) the net abatement amount for the previous reporting period was zero or greater than zero;

the carbon dioxide equivalent net abatement amount for the project in relation to a reporting period must be calculated using the following formula:

$A = \Delta C_P \times \frac{44}{12} - E_P$	**Equation 9**

Where:

A = project net abatement (in tonnes CO_2-e) for the reporting period.

ΔC_P = carbon stock change onsite (in tonnes C) in the project area at the end of the reporting period—from Equation 5.

E_P = total emissions from biomass burning (in tonnes CO_2-e) in the

project area during the current reporting period—from Equation 8.

(2) If the net abatement amount for the previous reporting period was less than zero, the net abatement amount must be calculated using the following formula:

$A = \left(\Delta C_P \times \frac{44}{12} - E_P\right) + A_{Rp}$	**Equation 10**

Where:

A = project net abatement (in tonnes CO_2-e) for the reporting period.

ΔC_P = carbon stock change onsite (in tonnes C) in the project area at the end of the reporting period—from Equation 5.

E_P = total emissions from biomass burning (in tonnes CO_2-e) in the project area during the current reporting period—from Equation 8.

A_{Rp} = project net abatement (in tonnes CO_2-e) for the previous reporting period—from previous offsets report.

Part 5—Reporting, record-keeping and monitoring requirements

Division 1—Offsets report requirements

55 Operation of this Division

For paragraph 106(3)(a) of the Act, this Division sets out the information that must be included in an offsets report about an avoided clearing project that is an eligible offsets project.

Note Other reporting requirements are set out in the rules made under the Act.

56 Information in each offsets report

(1) The following information must be included in each offsets report:
   (a) date stamped FullCAM output files (.plo file) for the baseline and project scenarios for each carbon estimation area;
   (b) for each FullCAM output file—a copy of the output data in a spreadsheet file;
   (c) the result of every calculation completed in accordance with Part 4;
   (d) if a thinning event occurred in the project area in the reporting period to which the offsets report relates—the record created in accordance with paragraph 58(d);
   (e) if a fire occurred in the project area in the reporting period to which the offsets report relates—the record created in accordance with paragraph 58(e);
   (f) if a non-fire natural disturbance occurred in the project area in the reporting period to which the offsets report relates—the record created in accordance with paragraph 58(f);

(2) If, in the circumstances described in paragraph 45(2)(b), a factor or parameter is defined or calculated for a reporting period by reference to an instrument or writing as in force from time to time, the offsets report about the project for the reporting period must include the following information for the factor or parameter:
   (a) the versions of the instrument or writing used;
   (b) the start and end dates of each use;
   (c) the reasons why it was not possible to define or calculate the factor or parameter by reference to the instrument or writing as in force at the end of the reporting period.

Division 2—Record-keeping

57 Operation of this Division

For paragraph 106(3)(c) of the Act, this Division sets out record-keeping requirements for an avoided clearing project that is an eligible offsets project.

Note Other record-keeping requirements are set out in rules made under the Act.

58 Records that must be created and kept

The project proponent must create and keep the following:
   (a) date stamped FullCAM output files (.plo file) for the baseline and project scenario for each carbon estimation area for each reporting period;
   (b) for each FullCAM output file—a copy of the output data in a spreadsheet file (.xls);

(c) the result of every calculation completed in accordance with Part 4;

(d) for each thinning event in the project area during the crediting period—a record of the following:

(i) the carbon estimation areas in which the thinning event occurred;

(ii) the dates on which the thinning event occurred;

(iii) for each carbon estimation area in which thinning occurred—an estimate of the proportion of the trees that were killed in the thinning event;

(iv) evidence justifying the estimate of the proportion of trees killed;

(e) for each fire in the project area during the crediting period—a record of the following:

(i) the carbon estimation areas in which the fire occurred;

(ii) the dates on which the fire occurred;

(iii) for each carbon estimation area affected by the fire—the area affected by the fire;

(iv) an estimate of the proportion of trees affected by the fire;

(v) evidence justifying the estimate of the proportion of trees affected;

(f) for each non-fire natural disturbance in the project area during the crediting period—a record of the following:

(i) the carbon estimation areas in which the disturbance occurred;

(ii) the dates on which the disturbance occurred;

(iii) for each carbon estimation area affected by the disturbance—the area affected by the disturbance;

(iv) an estimate of the proportion of trees affected by the disturbance;

(v) evidence justifying the estimate of the proportion of trees affected.

Division 3—Monitoring

59 Operation of this Division

For paragraph 106(3)(d) of the Act, this Division sets out monitoring requirements for an avoided clearing project that is an eligible offsets project.

Note Other monitoring requirements are set out in rules made under the Act.

60 Project monitoring

The project proponent must monitor the project area for:

(a) fires; and

(b) other natural disturbances.

Note ‘Natural disturbance’ is defined in section 5 of the Act.

Note If a natural disturbance occurs in the project area, notification requirements under section 81 of the Act apply.

Part 6—Reporting under section 77A of the Act

61 No division of carbon estimation area

For subsection 77A(2) of the Act, the division of the overall project must not result in the division of a carbon estimation area.