

Australian Government

Department of the Environment and Energy

FullCAM Guidelines

Requirements for using the Full Carbon Accounting Model (FullCAM) in the Emissions Reduction Fund (ERF) methodology determination:

Carbon Credits (Carbon Farming Initiative) (Native Forest from Managed Regrowth) Methodology Determination 2013

Version 2.1

(published and in force from xx Apr 2017)

Disclaimer

This document has been developed to assist project proponents to calculate abatement in FullCAM as required by the *Carbon Credits (Carbon Farming Initiative) (Native Forest from Managed Regrowth) Methodology Determination 2013.* This document is incorporated by reference in sections 1.3, 4.8, 4.9, 4.12, 4.14, 4.16, 4.18, 4.19, 4.30 and 5.3 of that determination. Project proponents should not use this document as a substitute for complying with the requirements in the Methodology Determination.

Before relying on any material contained in this document, project proponents should familiarise themselves with the requirements of the following legal documents: <u>Carbon Credits (Carbon Farming Initiative) (Native</u> Forest from Managed Regrowth) Methodology Determination 2013, <u>Carbon Credits (Carbon Farming Initiative)</u> Act 2011, <u>Carbon Credits (Carbon Farming Initiative) Rule 2015</u> and <u>Carbon Credits (Carbon Farming Initiative)</u> Regulations 2011. Project proponents are also advises to obtain professional advice suitable to their particular circumstances.

This document does not displace relevant legislative provisions or other laws. All users are encouraged to read this document in conjunction with the relevant legislation, including the methodology determinations, referenced throughout this document. Where any inconsistencies are apparent, please be aware that the legislative provisions will take precedence.

This document will be updated periodically and users should note that some inputs and values may change over time. It is the user's responsibility to ensure that they are using the version of this document and any tool/s required in association as in force at the applicable offsets report submission date (consistent with the definitions in section 1.3 of the Methodology Determination).

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1. Introduction

1.1 Use of FullCAM with the Native Forest from Managed Regrowth Methodology Determination 2013

The calculation of carbon abatement under the <u>Carbon Credits (Carbon Farming Initiative) (Native</u> <u>Forest from Managed Regrowth) Methodology Determination 2013</u> (the Determination) is dependent upon the use of the Full Carbon Accounting Model (FullCAM) consistently with the requirements of this document. In particular, sections 4.8, 4.9, 4.12, 4.14, 4.16, 4.18 and 4.19 of the Determination require that the materiality test, baseline scenario and project scenario for each carbon estimation area must be modelled in FullCAM in accordance with the requirements in both the Determination and this document.

Section 4.18 of the Determination requires that any project specific inputs specified in this document must be used to determine the project carbon stocks for a carbon estimation area. Note that each of the simulations and modelling events detailed in this document have specific inputs that must be used. In effect, proponents are required to model project carbon stocks reflecting actual management events for the entirety of the simulation period.

Section 4.30 and 4.31 of the Determination also requires key input and output data to be produced using FullCAM in accordance with the requirements in the Determination and this document. Where content of this document relates to provisions of the Determination, references are given to the location of those provisions.

Project proponents must only change FullCAM default settings as indicated in this document, and all other settings must not be changed. This is to ensure that defaults will apply where relevant.

The latest version of FullCAM is available for download from <u>www.environment.gov.au/climate-change/greenhouse-gas-measurement/land-sector</u>. You should check the Determination to determine which version of FullCAM you are required to use for your applicable offsets report. If you determine that you must use a version of FullCAM that is unavailable on the website, please contact the Department at <u>erfforests@environment.gov.au</u> to obtain a copy.

1.2 Format of this document

This document provides:

- an overview of FullCAM relevant to the Determination;
- an overview of the simulations you must run in FullCAM as per the Determination;
- a step-by-step walkthrough of using FullCAM to run the simulations correctly; and
- an overview of the FullCAM outputs as they relate to equations within the Determination.

Section 1 of this document provides an overview of FullCAM, its features relevant to users and important requirements for using this document. Section 2 outlines the process used to determine which type of baseline proponents must use in accord with the Determination. Section 3 provides a step-by-step walkthrough of how to run FullCAM 'simulations' for the materiality test, baselines, and project reporting.

Section 2 includes tables summarising the simulations that users may be required to run in FullCAM. These tables summarise the objective, time period and outputs for each simulation, as well as the project activities that may need to be simulated. Where settings differ between different simulation types for the step-by-step process, section 3 outlines the separate parameters required. Users should familiarise themselves with the simulations in section 2 before following the steps in section 3 to run the simulations. Section 4 provides an overview of the FullCAM outputs needed to complete the equations within the Determination.

1.3 FullCAM background

FullCAM is used in Australia's National Greenhouse Gas Accounts for the land sector. FullCAM provides fully integrated estimates of carbon pools in forest and agricultural systems for Australia's land sector reporting. In addition, it accounts for human-induced changes in emission and sequestration of major greenhouse gases. FullCAM was developed under the National Carbon Accounting System (NCAS) at the then Australian Greenhouse Office to provide a dynamic account of the changing stocks of carbon in Australia's land systems since 1970 by integrating data on land cover change, land use and management, climate, plant productivity, and soil carbon over time. FullCAM estimates carbon stock change and greenhouse gas emissions at fine spatial and temporal scales, and uses a wide range of spatially referenced data.

Users of FullCAM can determine estimates of carbon stock change and greenhouse gas emissions for ERF projects on a similar basis to that used for land use and land use change in Australia's National Greenhouse Gas Inventory.

1.4 FullCAM plots and running simulations

FullCAM can run simulations on a 'plot'. A plot, for modelling purposes, is defined as a piece of land for which the event history, when modelled in FullCAM, is the same across that area of land. Separate plot files are created for each CEA.

In FullCAM, there are several types of plots that can be selected. Only 'forest system' is relevant to this Determination. This document provides overviews of the simulations that users may be required in Section 2, and the steps to run these simulations in Section 3.

FullCAM models using a single 'model point' location. Proponents do not need to define plot boundaries within FullCAM, rather proponents must input the coordinates for a single location within the plot boundaries that is at the approximate centre of the plot (the model point – see paragraph 3.3(1)(c) of the Determination). The latest spatial data for a plot must be downloaded using the 'Data Builder' tab each time the software is run. This process is described in section 3.5 of this document.

Separate plot files must be created for each carbon estimation area (CEA) (see section 3.3 of the Determination). In order to ensure all settings are correct, including defaults, we recommend creating new plot files each time a new version of FullCAM or these Guidelines is used. Plot files created under previous versions may contain different settings that will affect outputs and users are responsible for any inconsistencies.

For each CEA, separate plot files must be created for:

- determining whether a zero baseline or non-zero baseline must be used (initial reporting period only);
- estimating carbon stocks under a non-zero baseline (if a zero baseline is not appropriate); which may be either a 'default' baseline, an 'historic' baseline or an 'hybrid' baseline;
- estimating carbon stocks for the current reporting period; and
- determining if a disturbance event must be reported prior to the next reporting period.

1.5 Overview of the FullCAM interface

The FullCAM software user interface displays menus and a series of tabs. Each tab has a suite of fields in which information may either be required to complete as instructed in section 3 or left unchanged. The program is designed so that certain tabs in a plot file are made available only if required fields have valid information entered in earlier tabs. If the text of a tab or field is red, then FullCAM requires information in that tab or field before a simulation can be run. When all the required fields within a tab have valid information entered, the tab text will become blue. Help is provided within FullCAM by clicking on the gran symbol available in most windows. A general overview of each tab follows.

Tab	Explanation
About	Includes a free text field where users can enter information about the plot file that
	they have created. This is a good space to keep track of changes that have been
	made or editing of event parameters.
Configuration	Users select the system (e.g. forest, agricultural) they want to simulate in the plot.
Timing	Enter the timing for starting and ending the simulation and the time steps required
	for output data.

There are only three tabs users see when they create a new FullCAM plot:

Once fields in the above three tabs are populated users can access the following additional tabs:

Tab	Explanation
Data	In this tab users enter the latitude and longitude of the 'Model Point Location'
Builder	where they wish to simulate a plot file. Internet access is required to complete this
	tab. By choosing to 'Download Spatial Data' the associated soil and climate data for
	that latitude and longitude are automatically loaded into relevant parts of the
	remaining tabs. In the tab users can then download tree and/or crop species
	information and management regimes as appropriate. This information is also
	automatically loaded into relevant parts of the remaining tabs.
Site	Specific parameters (e.g. water [rainfall], temperature, productivity) are described.
Trees	Description of the properties of the tree species.
Crops	Description of the properties of crop or pasture species (only displays if agricultural
	system selected).
Soil	Description of soil properties.
Initial	In this tab the values for carbon at the start of the simulation are described. Values
Conditions	will automatically be populated by Data Builder using data downloaded from the
	FullCAM server.
Events	All of the events for the entire simulation period are listed in this tab. Users can add
	or remove events. Care must be taken not to violate requirements for modelling
	'management events' within the Determination. The names on the event list are

	colour-coded to indicate whether they are ready, whether they are simulating or not, and what system they affect. The colour codes are:
	<u>Red:</u> Event not ready (renders event queue not ready); <u>Grey:</u> Event non-simulating (outside simulation period, will not affect simulation); <u>Green:</u> Forest; <u>Yellow:</u> Agricultural; and <u>Brown:</u> Mixed.
	Finally, the events users select with the cursor are coloured in the usual highlight colour.
Output Window	Defines what outputs are presented in output windows.
Explorer	Display of the parameter settings for each tab.
Log	This tab records changes made to the file to assist with analysis and error tracking.

2. Simulations overview

Sections 4.8, 4.9, 4.12, 4.14, 4.18 and 4.19 of the Determination require that the materiality test, baseline scenario and project scenario for each carbon estimation area must be modelled in FullCAM in accordance with the requirements in both the Determination and this document.

2.1 Baseline scenarios

The baseline for each CEA will be either of two categories depending on the materiality test below (Section 2.2) – a zero baseline or a non-zero baseline.

Within the non-zero baseline category there are three possible baselines depending on the extent of historical information available regarding the clearing history – default, hybrid or historic. The decision flowchart below gives an overview of the process for determining which baseline to use.

Figure 1: Decision tree for determining the type of baseline to be used for each Carbon Estimation Area (CEA). See section 4.12 of the Determination for the relevant provisions.



Start Here

2.2 Baseline materiality test

To determine whether a zero baseline may apply in a CEA, project proponents must complete the materiality test explained by this section and to be undertaken by following Section 3 of this document. Proponents must also comply with the provisions given for the materiality test in sections 4.7-4.9 of the Determination.

Factor	Explanation	Process for Calculating
C100_5%	5 per cent of the 'carbon mass of trees' at 100	see (a) below for how to calculate
	years after the implementation date	
C10	the maximum 'carbon mass of trees' over the ten	see (b) below for how to calculate
	years prior to the implementation date	

Completing the materiality test involves calculating two factors:

Note: 'Implementation date' is defined in section 1.3 of the Determination. It is the date when the project mechanism (a change in land management enabling native vegetation to achieve forest cover) was implemented in a CEA. Each CEA may have a different implementation date.

The values calculated for these factors will allow you to determine which baseline to use:

Result	Baseline to use
C10 is less than or equal to C100_5%	Zero baseline
C10 is greater than C100_5%	Non-zero baseline (default, hybrid or historic)

Overview of simulation for calculating C100_5%

 Table 1: Overview of simulation for calculating C100_5%

Objective	Calculate 5 per cent of the 'C mass of trees' at 100 years after the implementation date.
Simulation	From the implementation date to 100 years after the implementation date.
period	
Events permitted	Regeneration
Outputs	Monthly totals for 'C mass of trees' (FullCAM Output = Carbon / Forest / Plants / C mass of trees)

Overview of simulation for calculating C10

Note: When calculating C10, project proponents must have documentary evidence for each event that is entered into the FullCAM event queue.

Table 2: Overview of simulation for calculating C10

Objective	Calculate the maximum carbon mass of trees reached during the 10 years before the implementation date.
Simulation	From the day after the last comprehensive clearing before the 10 year period
period	that ends on the implementation date to the implementation date.
Events permitted	Regeneration
	Clearing
	Thinning
	Growth Pause
	Management Fire
	Windrow and Burn
Outputs	Monthly totals for 'C mass of trees' (FullCAM Output = Carbon / Forest / Plants
	/ C mass of trees)

Note: 'comprehensive clearing' is defined in section 1.3 of the Determination. It means the destruction of trees or saplings, or both, by mechanical or chemical means that may be accompanied by use of fire, leaving the land in a non-forested state for pastoral land use.

2.3 Non-zero baselines

Non-zero baselines must be calculated if, according to the materiality test under the previous section, the maximum carbon stock during the ten years prior to the implementation date has reached a material level (i.e. $C10 > C100_5\%$).

Overview of simulation for calculating a Default Baseline

A default non-zero baseline is suitable for project proponents whose records are not sufficient to model either an historic or a hybrid baseline. For further information about default non-zero baselines, see sections 4.12 and 4.15 of the Determination, and pages 19 to 21 and Appendix A of the Explanatory Statement for the <u>original Determination</u>. A default non-zero baseline is modelled in FullCAM by repeating the default baseline management event scenario over the baseline forecast period. This scenario consists of a sequence of comprehensive clearings that occur at 15 year intervals (refer to Table 3).

If project proponents can demonstrate that fire was used to suppress regrowth on land that is part of the same pastoral property as the CEA then:

- a management fire event may be included in each 15 year interval; and
- a 'Windrow and Burn' fire event may be added 6 months after a comprehensive clearing event.

Table 3: Overview of simulation for calculating a Default Baseline

Objective	Calculate the default baseline which estimates average carbon stocks in a carbon estimation area in the absence of an eligible offsets project.		
Simulation	From one day after the last comprehensive clearing event that occurred before the		
period	implementation date. Simulations end 100 years after the implementation date (the		
•	baseline forecast period).		
Events	Cycled every 15 years:		
permitted	Regeneration;		
-	Clearing;		
	• Management fire 7 years after Regeneration event – where sufficient evidence;		
	and		
	Windrow and Burn – where sufficient evidence.		
Outputs	uts Monthly totals for 'C mass of trees' (FullCAM Output = Carbon / Forest / Plants / C		
	mass of trees)		
	Monthly totals for 'C mass of debris' (FullCAM Output = Carbon / Forest / Debris / C		
	mass of forest debris)		

Overview of simulation for calculating a Hybrid Baseline

A hybrid baseline is suitable for project proponents who have evidence of two comprehensive clearings that occurred less than 15 years apart and before the implementation date. For further

information about hybrid baselines, see sections 4.12 and 4.15 of the Determination, and pages 19 to 21 and Appendix A of the Explanatory Statement for the original Determination.

A hybrid baseline is modelled in FullCAM by repeating the hybrid baseline management event scenario over the baseline forecast period. This scenario consists of a sequence of comprehensive clearings that occur at two alternating intervals, one default interval of 15 years, and one historic interval matching the interval between the last two clearings before the implementation date (refer to Table 4).

If project proponents can demonstrate that fire was used to suppress regrowth on land that is part of the same pastoral property as the CEA, then:

- a management fire event may be included in the 15 year *default* interval; and
- a 'Windrow and Burn' fire event may be included 6 months after the comprehensive clearing event at the beginning of the 15 year *default* interval.

If project proponents can demonstrate that fire was used in the second *historic* interval, then that fire event may be included in that interval.

Overview of simulation for calculating a Historic Baseline

Project proponents wishing to model an historic baseline must have evidence for at least three comprehensive clearings that occurred in the carbon estimation area before the implementation date. For further information about historic baselines, see sections 4.12 and 4.15 of the Determination, and pages 19 to 21 and Appendix A of the original Explanatory Statement.

A historic non-zero baseline is modelled in FullCAM by repeating the historic baseline management event scenario over the baseline forecast period. There are stringent evidentiary requirements for modelling an historic baseline. Project proponents must have documentary evidence for each event modelled in the scenario (refer Table 4).

Objective	Calculate historic and hybrid non-zero baselines which estimate average carbon stocks in a carbon estimation area in the absence of an eligible offsets project.
Simulation	One day after the most recent comprehensive clearing event. Simulations end
period	100 years after the implementation date (the baseline forecast period).
Events permitted	Regeneration
	Clearing
	Thinning
	Management fire
	Windrow and Burn
Outputs	Monthly totals for 'C mass of trees' (FullCAM Output = Carbon / Forest / Plants
	/ C mass of trees)
	Monthly totals for 'C mass of debris' (FullCAM Output = Carbon / Forest /
	Debris / C mass of forest debris)

Table 4: Overview of simulation for calculating a Historic or Hybrid Baseline

2.4 Overview of simulation for calculating project carbon stocks

To determine the project carbon stocks, project proponents must model all events listed in the table below that reflect the actual management events that occurred in the CEA during the entirety of the simulation period (from one day after the last comprehensive clearing before the implementation date until the end of the current reporting period).

Objective	Calculate total carbon stocks in each CEA at the end of each reporting period.		
	These carbon stocks will reflect the age of the regrowth within the CEA,		
	observed climate, and activities and disturbance subsequent to the		
	establishment of the offsets project.		
Simulation	From one day after the last comprehensive clearing before the		
period	implementation date. Simulations end at the end of the current reporting		
	period.		
Events permitted	Regeneration		
	Clearing		
	Thinning		
	Growth pause		
	Prescribed fire – to reduce fire risk		
	Wildfires – trees not killed		
	Wildfires – trees killed		
	Management fire		
	Windrow and burn		
Outputs	Monthly totals for 'C mass of trees' (FullCAM Output = Carbon / Forest / Plants		
	/ C mass of trees)		
	Monthly totals for 'C mass of debris' (FullCAM Output = Carbon / Forest /		
	Debris / C mass of forest debris)		
	Monthly totals for emissions of CH ₄ from fire (FullCAM Output = Whole /		
	Emissions / CH ₄ emitted due to fire)		
	Monthly totals for emissions of N ₂ O from fire (FullCAM Output = Nitrogen /		
	Whole / Emissions / N ₂ O emitted due to fire)		

Table 5 Overview of simulation for calculating project carbon stocks

3. Setting up simulations for carbon estimation areas

The following steps must be followed for entering data into each tab in a FullCAM plot file. Each table provides a sequential list of steps in the right hand column. The left hand column indicates the Simulation Type that the steps are relevant to. Screenshots relevant to each set of steps, directly follow each table.

3.1 **Opening a file**

Simulation Type	Steps required
C100_5% C10 Default baseline Historic baseline Hybrid baseline Project carbon	 Open a new plot under the 'File' menu. Enter a name for the plot that reflects the identifier for the CEA and model scenario, e.g. 'CEA1_baseline'.

File	<u>E</u> dit	Simulate	Inte	ernet	<u>U</u> tilities	Window	<u>H</u> elp	
2	Open Recent	Ctrl+0					•][
	New		P	New	Plot Ctrl+N			
	Close	Ctrl+W	Ē	New	Estate			
	Save Save As .	Ctrl+S						
Ø	Save Cop Save All (r y As Ctrl+Alt+S						
	Exit	Ctrl+Q						

3.2 Saving a plot file

Simulation Type	Steps required
C100_5% C10 Default baseline Historic baseline Hybrid baseline Project carbon	 Save the plot file using the 'File' menu on the FullCAM toolbar. Save the plot file regularly when setting up and running simulations.

File	Edit	Simulate	Internet	<u>U</u> tilities	Window	<u>H</u> elp	
Ê	Open	Ctrl+0				•]	😬 📕 😱 CF
	New Close	Ctrl+W					
	Save	Ctrl+S					
	Save As						
ø	Save Cop Save All C	y As Ctrl+Alt+S					
	Exit	Ctrl+Q					

3.3 The Configuration Tab

Simulation Type	Steps required
C100_5%	• From the 'Plot' drop down menu, select 'Forest system'.
C10	Do NOT change any other settings.
Default baseline	
Historic baseline	
Hybrid baseline	
Project carbon	

Type F	orest system	1	•	Risk Analysis	8
Include:	Soil and mi	ine		Other Options	9
Method	Tree yield for	mula 🔻			
Calculate	from scratch:	Forest productivity inc Temperature modifier Soil water modifier Frost modifier	lex (FPI)	About Your Configuration Models and Inputs Diagrams	

3.4 The Timing Tab

Simulation Type	Steps required
C100_5%	Set the Simulation Timing to 'calendar'.
CIU Default baseline	• Set the Output Steps to 'months'.
Historic baseline	
Project carbon	
C100_5%	 Enter the date to start simulations as the implementation date. Enter the date to end the simulation as 100 years after the implementation date.
C10	• Enter the date to start simulations as the day after the last comprehensive clearing that occurred before the 10 year period that ends on the implementation date. Enter the date to end the simulation as the implementation date.
Default baseline	• Enter the date to start simulations as one day after the last
Hybrid baseline	• Enter the date to and the simulation as 100 years after the
Project carbon	implementation date.
C100_5%	Do NOT change any other settings.
C10	• New tabs will appear once this tab has been completed.
Default baseline	
Historic baseline	
Hybrid baseline	
Project carbon	



3.5 The Data Builder Tab

Simulation Type	Steps required
C100_5% C10	• Check the box to turn on the Data Builder (this requires an internet connection).
Default baseline Historic baseline Hybrid baseline	• Enter the latitude and longitude (in decimal degrees) of the model point location central to the CEA being modelled and not in an exclusion area.
Project carbon	• Click the button to 'Download Spatial Data' and click 'OK' on the information box that pops up.
	• Select 'Mixed species environmental plantings' from the dropdown box for 'Tree species' and then click the button to 'Download This Species' and 'Yes' to 'Make mixed species environmental plantings the initial tree species'. NB: Do NOT use the 'Mixed species environmental plantings temperate' setting.
	Do NOT download a regime (and therefore the events associated with
	the regime) for this species.
	• Do NOT change any other settings.

Output Windows	ation Timing Data Builder Site Explorer Log	e Trees Soil	Initial Conditions Events
Spatial Data		1	State = Northern Territory
Latitude -25.3	40 00 deg N		SA2 = Petermann - Simpson (71050)
Longitude 131.0	130 00 deg E Forest % down	nload 📃 %	NPI Region = No Region Growth Calibration Region = 0
Download S	patial Data		
		7	
Trees and Even	ts	-	
Tree species	Mixed species environmental planting		▼ 24
	Download This Species Already	ed	
Bagimas	Download This Species Already download	ed	tion high: Non-commercial planting: No 22
Regimes (Initial Rotation)	Download This Species Aiready download Mixed species environmental planting I Download Events For This Regime	ed (1970-present All Planta Clear Forest Events	tion high: Non-commercial planting; No 24
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3.6 The Site Tab

Simulation Type	Steps required
C100_5%	Do NOT change any settings.
C10	
Default baseline	
Historic baseline	
Hybrid baseline	
Project carbon	

3.7 The Tree Tab

Simulation Type	Steps required
C100_5%	Do NOT change any settings.
C10	
Default baseline	
Historic baseline	
Hybrid baseline	
Project carbon	

3.8 The Soil Tab

Simulation Type	Steps required
C100_5% C10 Default baseline	Do NOT change any settings.

Historic baseline		
Hybrid baseline		
Project carbon		

3.9 The Initial Conditions Tab

Simulation Type	Steps required
C100_5%	Click the button labelled 'Trees' and uncheck the box under
C10	'Existence' to show that the site did not have trees growing on it at
Default baseline	the start of the simulation. Click 'OK'.
Historic baseline	• Click the button labelled 'Debris' and change all the default settings
Hybrid baseline	for each debris pool to zero.
Project carbon	Do NOT change any other settings.

CEA1_baseline.plo About Configuration Timing	Data Builder Site Trees Soil Initial	Conditions Events
Output Windows Explorer Lo	pg	
Forest	Agricultural	
<u>I</u> rees	<u>C</u> rops	
Debris	Debris	
<u>S</u> oil	Sgl	
Products	Products	
Whole Plot The percentage of the plot that	is forest (by area) is	
Plot Ready to simulate	Initial Conditions page ready	ł

Itxed species environmental planting stence The forest has trees growing in it at the start of the simulation recitly Tree of Maximum Tree Biomass Volumes [m3/ha] Masses [dmt/ha] Stems Stems Foliage Branches Ages [yr] Bonts	alues
istence The forest has trees growing in it at the start of the simulation Peccify Tree Insert Standard Va of Maximum Tree Biomass Volumes [m3/ha] Masses [dmt/ha] Stems Stems Stems, branches Branch	alues
The forest has trees growing in it at the start of the simulation pecify Tree of Maximum Tree Biomass Volumes [m3/ha] Masses [dmt/ha] Stems Stems Foliage Branches Ages [yr] Borts	alues
of Maximum Tree Biomass Volumes [m3/ha] Masses [dmt/ha] Stems Stems Stems Foliage Branches Ages [yr] Boots	alues
of Maximum Tree Biomass Volumes [m3/ha] Stems Stems Stems, branche Branches Ages [yr] Ronts	alues
of Maximum Tree Biomass Volumes [m3/ha] Masses [dmt/ha] Stems Stems Stems, branche Branches Foliage Bark Ages [yr] Boots	
of Maximum Tree Biomass Volumes [m3/ha] Masses [dmt/ha] Stems Stems Stems, branche Branches Foliage Bark Ages [yr]	
Stems Stems Stems, branche Branches Foliage Bark Ages [yr] Boots	
Branches Rank Ages [yr] Roots	es, bark
Bark Ages [yr]	
Leaves Age of oldest trees	
Coarse roots Average age of trees Numbers of Trees	
Fine roots Stems per hect.	are

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ine dead roots 0 0	oarse dead roots	0	0	
	ine dead roots	0	0	

3.10 The Events Tab

The Events Tab is where events for a simulation can be added and displayed in sequence.

Simulation Type	Permitted Events
C100_5%	Regeneration
C10	Regeneration
	Clearing
	Thinning
	Management fire
	Windrow and burn fire
Default baseline	Regeneration
	Clearing
	Management fire – where sufficient evidence (see s 4.12 of the Determination)
	Windrow and burn fire – where sufficient evidence (s 4.12 of the Determination)
Historic baseline	Regeneration
Hybrid baseline	Clearing
	Thinning
	Management fire – where sufficient evidence (see s 4.12 of the Determination)
	Windrow and burn fire – where sufficient evidence (s 4.12 of the Determination)
Project carbon	Regeneration
	Clearing
	Thinning
	Growth pause
	Management fire
	Windrow and burn fire
	Prescribed fire – to reduce fire risk
	Wildfire – trees not killed
	Wildfire – trees killed

Table 6: Permitted Events for each Simulation Type

CEA1_baseline.plo			
About Configuration Timing [Data Builder Site Trees	Soil Initial Co	nditions Events
Output Windows Explorer Log			
Regime Editing	Event Editing	Status	#events in queue 0
New Clone	NewClone	Ready	Simulating 0 Non-simulating 0
Edit Delete *	Edit		
# regimes in queue 0	Sort by system	Initial conditions	
unique 0 👩	Only show simulating events Sort by whether simulating	No trees.	
	▼ Date Name	Notes	
]
Plot Ready to simulate	Events page ready		Â

3.10.1 Adding a regeneration event

Regeneration events must be added to the FullCAM event queue for each CEA to model the establishment of forest potential after each comprehensive clearing. In the absence of evidence to the contrary, the timing of attainment of forest potential is deemed to occur one year after each comprehensive clearing event. Evidence is required to set the date of regeneration to any other time after clearing. See section 4.6 of the Determination for details.

For the default baseline, regeneration events and clearing events should recur on a 15 year cycle for the duration of the simulation (i.e. 12 months from clearing to regeneration plus 14 years of growth prior to re-clearing).

Note: Where there is evidence of regeneration following a wildfire where trees were killed, a regeneration event must be added to the events queue 12 months after each wildfire – trees killed event, unless there is specified evidence to set the date of regeneration to some other time after clearing (See section 4.6 of the Determination).

Note: Where there is evidence of regeneration following a windrow and burn following clearing, a regeneration event must be added to the events queue 6 months after each windrow and burn event.

Simulation	Steps required
Туре	
C100_5% C10 Default baseline Historic baseline Hybrid baseline Project carbon	• Click the 'New' button under 'Event Editing' to create a new event.
C100_5%	• Insert the simulation start date in the blank field beside the 'Timing' section. This will need to be entered in the format dd mmm yyyy.
Default baseline	• For the first regeneration event, insert the time when regeneration commenced following the most recent comprehensive clearing event in the blank field beside the 'Timing' section. This will need to be entered in the format dd mmm yyyy. For all other regeneration events insert the date 15 years after the previous regeneration event.
C10 Historic baseline Hybrid baseline Project carbon	• For the first regeneration event, insert the time when regeneration commenced following the most recent comprehensive clearing event in the blank field beside the 'Timing' section. This will need to be entered in the format dd mmm yyyy. For all subsequent regeneration events insert the date for each to represent the observed or default interval between regeneration events.
C100_5% C10 Default baseline Historic baseline Hybrid baseline Project carbon	 In the drop down menu next to 'Type', select 'Plant trees'. Click 'Insert standard values'. Select the row with the 'Event Name' of 'Plant trees: natural regeneration' and then click 'OK' and 'Yes' to insert the name of the standard event. Do NOT change any other setting. Click 'OK' to finish adding the event to the event queue.

) Event		×
lame	Auto Name 😗	ОК
ype Plant trees Notes	Usage	Cancel
Timing		0
✓ Simulate Calendar date → 12 Jan 2015	Days 0 Add Days	
Plant Trees	linsert Standard Va	()
Species	Index did idale va	
	-	
Specify Tree Size By		
Masses		
Masses (dmt /ba) Volumes [m3/ba]		
Stems Stems		
Branches		
Bark Age [yr]		
Leaves		
Coarse roots		
Fine roots		
Parameters for the Tree Yield Formula		
Enable rotation specific TYF Parameters		
Tree age of maximum growth (G) [yr]		
Tree vield multiplier		
Thes Mein monthlier		

Species /	Event Name	Event Label	Ε
Mixed species environmental planting	Plant trees: natural regeneration		F
Vixed species environmental planting Vixed species environmental planting Mixed species environmental planting	Plant trees: seedlings, high stocking Plant trees: seedlings, low stocking Plant trees: seedlings, normal stocking		F F F
			ancel

Event	
Name Plant trees: natural regeneration	Auto Name 😗 OK
Type Plant trees Notes	Usage Cancel
Timing	
✓ Simulate Calendar date	iys 0 Add Days
	0
Plant Trees	Insert Standard Values
Species	
Mixed species environmental planting	· · · · · · · · · · · · · · · · · · ·
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Masses [dmt/ha] Volumes [m3/ha]	
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0 Branches	
0 Bark Age [yr]	
0 Leaves 0 Trees	
0 Coarse roots	
0 Fine roots	
Parameters for the Tree Yield Formula	
Enable rotation specific TYF Parameters	
Tree age of maximum growth (G) [yr]	
Trae yield multiplier	
nee yea malphe	
Regime Editing Event Editing New Clone Edit Delete # regimes in queue 1 Soft by system unique 1 Only show simulating events	Status # events in queue 1 Ready Simulating 1 Non-simulating 0 Initial conditions No trees.
Jan 2015	
New Regime V Date Name	Notes
12 Jan 2015 Plant trees: na	atural regener.

3.10.2 Adding a clearing event

These steps must be repeated for each clearing event that occurs in each CEA during the simulation period. For each clearing event the date must reflect the date of that clearing event.

Simulation Type	Steps required
C100_5%	Not permitted
Project carbon	Not permitted
C10	• Click the 'New' button under 'Event Editing' to create a new event.
Default baseline	
Historic baseline	
Hybrid baseline	
C10 Historic baseline	• Insert the date of the clearing event in the blank field beside the (Timing' section based on the interval observed historically. This will
Hybrid baseline	need to be entered in the format dd mmm www. For subsequent
	clearing events insert the date of clearing in this field to represent
	the observed or default interval between comprehensive clearings.
Default baseline	• Insert the date of the clearing event in the blank field beside the
	'Timing' section. The intervals between events must reflect those that
	occurred historically. This will need to be entered in the format dd
	mmm yyyy. Each clearing event will be 14 years after the previous
	regeneration event.
C10	In the drop down menu next to 'Type', select 'Thin'.
Default baseline	• Click 'Insert standard values'. Select the row with 'Event Name' of
Historic baseline	Initial clearing: No product recovery and then click 'OK' and 'Yes' to
nybriu baseline	Insert the name of the standard event.
	Ensure that the box next to Affected portion contains the value 100 to indicate a clearing event
	Do NOT change any other settings
	 Click (OV' to finish adding the event to the event queue

Name Notes Fining Notes Ø Simulate Calendar date 12 Jan 2020 Days 0 Finin Affected Portion Age Adjustment Percentage of forest affected by thin Enable biomass based age adjustment Destination Percentages in the Affected Portion Post-The Log grades Manual Relative Stems to: Branches to: Bark to: 1 Deadwood Deadwood Bark litter 1 Paper and pulp Paper and pulp Paper 1 Packing wood Packing wood Packing wood Leag litter Fine Roots to: Fine dead roots Coarse Roots to: Length of other Mill residue Biofuel Biofuel Biofuel Relead roots Fine Roots to: Fine dead roots Coarse dead roots to: Coarse dead roots to: Average at removed to: Deadwood to: Biofuel Biofuel Biofuel Biofuel Coarse dead roots to: Fine Roots to: Fine dead roots Coarse dead roots to: Coarse dead roots to: Average at removed to: Deadwood to: </th <th></th>	
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Leaf Litter to: Biofuel	

pecies /	Event Name	Event Label	
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ixed species environmental planting	Initial clearing: product recovery		
ixed species environmental planting	Prune (Selective, 33%)		
ixed species environmental planting	Prune (Selective, 33%) 2		
xed species environmental planting	Prune (Selective, 33%) 3		
ixed species environmental planting	Prune (Selective, 33%) 4		

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3.10.3 Adding a thinning event

These steps must be repeated for each thinning event that occurs in each CEA during the simulation period. For each thinning event the date must reflect the date of the thinning event.

Simulation Type	Steps required
C100_5%	Not permitted
Default baseline	Not permitted
C10	1. Click the 'New' button to create a new event.
Historic baseline	2. Insert the date of the thinning event in the blank field beside the
Hybrid baseline	'Timing' section. This will need to be entered in the format dd mmm
Project carbon	yyyy. The intervals between events must reflect those that occurred
	historically.
	3. In the drop down menu next to 'Type', select 'Thin'.
	4. Click 'Insert standard values'. Select the row with 'Event Name' of
	'Initial clearing: No product recovery' and then click 'OK' and 'Yes' to
	insert the name of the standard event.
	5. In the box next to 'Affected portion – the percentage of forest
	affected by thin' change the number to an estimate of the proportion
	of the stems that were killed in the thinning. You must report on how
	the estimate was derived in your project report.
	6. Do NOT change any other settings.
	7. Click 'OK' to finish adding the event to the event queue.

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	Paper and pulp		Paper and pulp		1					
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Select A Standard Event				x
Species 🗡	Event Name	Event Label	Event Description	
Mixed species environmental planting	Initial clearing: no product recovery		Thin (clearing)	
Mixed species environmental planting	Initial clearing: product recovery		Thin (clearing)	
Mixed species environmental planting	Prune (Selective, 33%)		Thin on 33% (removes 0% of stems)	
Mixed species environmental planting	Prune (Selective, 33%) 2		Thin on 33% (removes 0% of stems)	
Mixed species environmental planting	Prune (Selective, 33%) 3		Thin on 33% (removes 0% of stems)	
Mixed species environmental planting	Prune (Selective, 33%) 4		Thin on 33% (removes 0% of stems)	
			OK Cancel	
	The second se	The second se		

me Initial	clearing: r	no produc	t recovery				_	Auto Name	0 ок
e Thin				Notes			_	Usage	Cance
									L
ming							,		
Simulate	9	Calend	ar date		2025	Days	0	Add Days	
nin ffected	Portion			Age Ad	djustment			Inse	ert Standard Values
30	Percent	age of fo	rest affected	by thin 📄 Enat	ole biomass ba	ised age adjustme	int		
estinatio D Log gr	on Perce	ntages O Man	in the Affe ual	cted Portion			Post-T Relativ	hin Period re Allocation Multipliers	8
tems to:			Branches	to:	Bark to:			Stems	
tems to: 100	Deadwo	bod	Branches 100	to: Deadwood	Bark to: 100	Bark litter		Stems Branches	
tems to: 100 0	Deadwo Biofuel	bod	Branches 100 0	to: Deadwood Biofuel	Bark to: 100 0	Bark litter Biofuel		Stems Branches Bark	
tems to: 100 0	Deadwo Biofuel Paper a	ood nd pulp	Branches 100 0	to: Deadwood Biofuel Paper and pulp	Bark to: 100 0	Bark litter Biofuel Paper		Stems Branches Bark Leaves	
tems to: 100 0 0	Deadwo Biofuel Paper a Packino	nd pulp	Branches 100 0 0	to: Deadwood Biofuel Paper and pulp. Packing wood	Bark to: 100 0 0	Bark litter Biofuel Paper Mill residue		Stems Branches Bark Leaves Coarse roots	
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items to: 100 0 0 0 0 0 0 100.0 Fine I Dead Chopped Bark	Deadword Biofuel Paper a Packing Fumitun Fiberbo: Constru Mill resid Roots to: wood to: Litter to:	nd pulp g wood e ard ction due 100 0 0 0	Branches 100 0 0 0 0 0 0 0 0 0 0 0 0	to: Deadwood Biofuel Paper and pulp Packing wood Fumiture Fiberboard Construction Mill residue	Bark to: 100 0 0 100.0 Leaves to: 100 0 100.0 Coarse Ro 100 0 100.0	Bark litter Biofuel Paper Mill residue Leaf litter Biofuel Dts to: Coarse dead roots Biofuel	Length Tree F Trees (s Average removed	Stems Branches Branches Bark Leaves Coarse roots Fine roots of Period Years [vr] Removal and Repla stems) removed by this e age of d trees = + + + + + + + + + + + + + + + + + + +	acement s thin: 100.0% X Average age of tre X Age of the oldest t

3.10.4 Adding a growth pause event

A growth pause event occurs when growth slows, stops or reverses due to a growth suppression event, such as grazing by livestock or feral animals, mechanical or chemical destruction or suppression of regrowth and weeds, disease, pests or similar, or a combination of factors. Where other events in this section are more specific to the actual event that has occurred, such as thinning or fire, they are to be modelled and not a growth pause event. To avoid any doubt, for the project carbon stocks and C10 simulations, a growth pause event must be added for any growth suppression events whether occurring before or after the implementation date.

A growth pause event must run for at least the period of time that the suppression factor(s) was maintained. For example, if intermittent grazing slowed, stopped or reversed the vegetation growth over a period of three years, the corresponding growth pause event in FullCAM should cover at least the entire three year period. A growth pause event should also cover the time from when the vegetation was first affected by the suppression factor(s) to when it has recovered beyond its condition and mass prior to being affected.

Notes on grazing by livestock:

1. If the project activity undertaken for the CEA includes the exclusion of livestock from the CEA, then grazing by livestock cannot normally be modelled as this is not allowed under the Determination. However, if there is unintentional, short term grazing by livestock (e.g. due to

stock entering a CEA through a damaged fence), then the grazing must be modelled as described below for the length of time that the unintentional grazing occurred.

2. If the human-assisted regeneration activity undertaken as part of the project <u>does not</u> include the exclusion of livestock from the CEA, then the impact of grazing by livestock only must be modelled (as described below) if the carbon stock in the CEA becomes materially less than it would otherwise have been in the absence of grazing. Note that certain provisions apply to grazing under Division 3.3 of the Determination regarding restricted activities.

Notes on feral animal grazing

- 1. <u>Prior to the attainment of forest cover</u>: If there is grazing by feral animals within a CEA, and the impact of the grazing is such that the attainment of forest cover is being retarded compared with what would be expected in the absence of grazing by feral animals, then this is a suppression event, and must be modelled as described below.
- 2. <u>After the attainment of forest cover</u>: If there is grazing by feral animals within a CEA, and the impact of the grazing is such that forest cover is threatened (or even removed), and/or due to the grazing, the carbon stock in the CEA becomes materially less, then this is a disturbance event and must be modelled as described below.

Simulation Type	Steps required
C100_5%	Not permitted
Default baseline	Not permitted
Historic baseline	Not permitted
Hybrid baseline	Not permitted
C10	1. Add a new Forest treatment event.
Project carbon	2. DO NOT select Insert Standard Values (Note: This differs from the
	directions for other events above).
	3. Enter the calendar date of the start date of the disturbance event. This can be estimated if the actual date is not known.
	4. Enter 'Growth Pause' as the event name (or a more specific name for the event, e.g. 'Grazing').
	5. Now check the Type 1: Age Advance, 'On' box under Forest Treatment.
	6. In the Age advance due to treatment box enter an estimate for how long the growth pause event should run according to the above notes as a decimal proportion in years, and as a negative number. For example, if the growth pause event occurred for 3 years and 9 months, then '-3.75' would be entered in this box. As another example, If the growth pause event occurred for 5 years, then '-5' would be entered in this box.
	7. In the <i>Advancement period</i> box enter the absolute (aka positive) value of the number added in the 'Age advance due to treatment' box. For example, using the examples above in step 6, the value to add to this box would be: '3.75', or '5'.
	8. Following these steps has the effect of 'pausing' growth in carbon stocks for the duration of the growth pause event
	9 DO NOT change any other values on this tab
	10 Press 'OK'

📳 Event							
Name					<u>A</u> uto Name	8	<u>о</u> к
Type Forest treatment	Label				<u>U</u> sage		ancel
Plant trees							
Forest fire			Days	0 A	dd Days		•
Chopper roller							
Forest I reatment					Ins	sert Standard Values.	🤇
Type 1: Age Advance							
On							
Age adv	ance due to treatment ement period fur]						
	curenc benea Bil	\checkmark					
Type 2: Tree Yields							
On	11 N. N.						
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Event							
Event					Auto Name	2	OK OK
() Event Name Grazing	a label				<u>A</u> uto Name	0	
Event Name Grazing Type Forest pament	▼ Label				Auto Name Usage	9	QK QK
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Event					
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Type Torest trouting	ent -	abei		Usage	
Timing		1 1 2004			0
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Event					
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5 Type 2: Tree Y	dvancement period [yr	, 			
Type 2: Tree Y	ields Tree yield multiple				

3.10.5 Adding fire events

3.10.5.1 Adding a management fire event

These steps must be repeated for each management fire event that follows a clearing event that occurs in a CEA during the simulation period. A management fire event encourages grass for pasture. It is a fire that occurs within a clearing interval and is used to set back the regrowth, killing a substantial proportion of the above ground plant parts. For each of these events, the date must reflect the date of that event.

Simulation Type	Ste	eps required
C100_5%	•	Not permitted
C10	•	Not permitted
Default baseline	1.	Click on the 'New' button to create a new event.
Historic baseline	2.	In the blank field besides the 'Timing' section, insert the date of the
Hybrid baseline		management fire in the simulation period. The intervals between
Project carbon		events must reflect those that occurred historically. For example, for
		default values used in baselines, this is 7 years after the regeneration
		event.
	3.	In the drop down menu next to 'Type', select 'Forest fire'.
	4.	Click 'Insert standard values'. Select the row with 'Event Name' of
		'Wildfire – trees killed' and then click 'OK' and 'Yes' to insert the name
		of the standard event.
	5.	Change the name of the event to 'Management fire'.
	6.	CHANGE THE SETTINGS TO MATCH THOSE IN THE SCREENSHOT
		BELOW.
	7.	Tick the 'Enable biomass based age adjustments' box.
	8.	Click 'OK' to finish adding the event to the event queue.

🐌 Event									(var ee	18 194	x
Name							10	Auto Name	, (ок	
Type Forest fire	е		Notes					Usage		Cance	3
Timing											0
Simulate	Cale	ndar <mark>d</mark> ate	•	21 Dec 2016		Days 0		Add Days]		
Forest Fire									Insert Stand	ard Values	0
Affected Por	rtion		Leaf Re	growth Perce	ntage		Age	Adjustment			
	Percentage of	of forest		Percentag	e of leaves	that	En En	able biomas	s based age ad	ustment	
	affected by fi	ire		automatic	ally' regrow	in year after fire					
Destination F	Percentage	s in the Affe	cted Porti	on							
Tree	To Atmos.	To Debris	Deco	mposable Debris	To Atmos.	To Inert Soil					
Stems			De	eadwood							
Branches			Ch	nopped wood							
Bark			Ba	ark litter							
Leaves			Le	af litter							
Coarse roots			Ca	oarse dead roots							
Fine roots			Fir	ne dead roots							
			Resis	tantDebris	To Atmos.	To Inert Soil					
			D	eadwood							
			Ch	nopped wood							
			Ba	ark <mark>l</mark> itter							
			Le	af litter							
			Co	arse dead roots							
			Fir	ne dead roots							

	L'I OTRI TIGITO	EVenil Laber	Event Description
Aixed species environmental planting	Prescribed burn	All regions	Forest fire on 100%
Nixed species environmental planting	Site prep: Broadcast Burn	All regions	Forest fire on 100%
Nixed species environmental planting	Site prep: Windrow and burn	All regions	Forest fire on 100%
lixed species environmental planting	Wildfire - trees killed	All regions	Forest fire (clearing)
lixed species environmental planting	Wildfire - trees not killed	All regions	Forest fire on 100%

CONTRACTOR OF								
Name Manage	ement Fire	~					Auto Name] 😗 ок
Type Forest fi	ìre		Notes				Usage	Cancel
Timina								
iming	(<u>.</u>	1 1 .	01 D == 2010	1	D	0		
Simulate	Laler	ndar date	21 Dec 2016		Days	U	Add Days	
and Fire							e	
orestrife	e							Insert Standard Values
Affected Po	ortion		Leaf Regrowth Percer	ntage		Ag	e Adjustment	
100	Percentage of	of forest	0 Percentag	e of leaves	that	V	Enable biomass b	based age adjustment
	allected by li	le	automatica	ally regrow	in year alter fil	e		
Destination	Percentage	s in the Affec	ted Portion					
Tree	To Atmos.	To Debris	Decomposable Debris	To Atmos.	To Inert Soil			
				-				
Stems	0	30	Deadwood	75	0			
Stems Branches	0	30	Deadwood Chopped wood	75 0	0			
Stems Branches Bark	0 0 15	30 30 15	Deadwood Chopped wood Bark litter	75 0 65	0			
Stems Branches Bark Leaves	0 0 15 20	30 30 15 40	Deadwood Chopped wood Bark litter Leaf litter	75 0 65 65	0 0 0 0 0 0 0			
Stems Branches Bark Leaves Coarse roots	0 0 15 20 s	30 30 15 40 0	Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots	75 0 65 65 0	0 0 0 0			
Stems Branches Bark Leaves Coarse roots Fine roots	0 0 15 20 s	30 30 15 40 0 2	Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots	75 0 65 65 0 0	0 0 0 0 0			
Stems Branches Bark Leaves Coarse roots Fine roots	0 0 15 20 s	30 30 15 40 0 2	Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris	75 0 65 65 0 0	0 0 0 0 0 0			
Stems Branches Bark Leaves Coarse roots Fine roots	0 0 15 20 s	30 30 15 40 0 2	Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood	75 0 65 65 0 0 To Atmos. 75	0 0 0 0 0 0 0 0 0			
Stems Branches Bark Leaves Coarse roots Fine roots	0 0 15 20 s	30 30 15 40 0 2	Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood Chopped wood	75 0 65 0 0 0 To Atmos. 75 0	0 0 0 0 0 0 0 0 0 0			
Stems Branches Bark Leaves Coarse roots Fine roots	0 0 15 20 s	30 30 15 40 0 2	Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood Chopped wood Bark litter	75 0 65 0 0 0 To Atmos. 75 0 65	0 0 0 0 0 0 0 0 0 0 0 0 0 0			
Stems Branches Bark Leaves Coarse roots Fine roots	0 0 15 20 s	30 30 15 40 0 2	Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood Chopped wood Bark litter Leaf litter	75 0 65 65 0 0 0 75 75 0 65 65	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			
Stems Branches Bark Leaves Coarse roots Fine roots	0 0 15 20 s	30 30 15 40 0 2	Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots	75 0 65 65 0 0 75 75 0 65 65 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			
Stems Branches Bark Leaves Coarse root: Fine roots	0 0 15 20 s	30 30 15 40 0 2	Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots	75 0 65 65 0 0 75 75 0 65 65 65 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			

3.10.5.2 Adding a windrow and burn fire event

These steps must be repeated for each windrow and burn fire event that follows a clearing event that occurs in a CEA. A windrow and burn fire event reduces the amount of debris that remains after the clearing event. For each of these events, the date MUST reflect the interval between events.

Simulation Type	Steps required							
C100_5%	Not permitted							
Project carbon	Not permitted							
C10	1. Click on the 'New' button to create a new event.							
Default baseline	2. Insert the date of the windrow and burn fire in the simulation period							
Historic baseline	in the blank field beside the 'Timing' section.							
Hybrid baseline	3. In the drop down menu next to 'Type', select 'Forest fire'.							
	4. Click 'Insert standard values'. Select the row with 'Event Name' of 'Site prep: Windrow and burn' and then click 'OK' and 'Yes' to insert the name of the standard event.							
	5. Do NOT change any other setting.							
	6. Click 'OK' to finish adding the event to the event queue.							
🛑 Eve	ent							
-------	-----------	----------------	---------------	---------------------	--------------	--------------------	---------------------	---------------------
Name	-						Auto Name	ОК
Туре	Forest fi	ire	•	Notes			Usage	Cancel
Timi	ng							e
S	imulate	Caler	ndar date	✓ 30 May 2018]	Days 0	Add Days	-
Fore	est Fire	3						ant Shandard Values
Affe	cted Po	ortion		Leaf Regrowth Perce	ntage		Ane Adjustment	sen Standard Values
-		Percentage	of forest	Percentac	e of leaves	that		
		affected by fi	re	automatic	ally' regrow	in year after fire	Enable biomass base	ed age adjustment
								•
Dest	ination	Percentage	s in the Affe	cted Portion				
Tree	8	T A:	· ·	Decomposable Debris		T 1 1 0 1		
0.	5	To Atmos.	To Debns	Deadword	To Atmos.	To Inert Soil		
De	ms			Channed wood				
Bar	dr.			Bark litter				
Lez	aves	· · · · ·		Leaf litter	-			
Coa	arse root	s		Coarse dead roots		-		
Fin	e roots			Fine dead roots				
				ResistantDebris	To Atmos.	To Inert Soil		
				Deadwood	-			
				Chopped wood				
				Bark litter				
				Leaf litter				
				Coarse dead roots				
				Fine dead roots				

pecies /	Event Name	Event Label	Event Description
lixed species environmental planting	Prescribed burn	All regions	Forest fire on 100%
ixed species environmental planting	Site prep: Broadcast Burn	All regions	Forest fire on 100%
ixed species environmental planting	Site prep: Windrow and burn	All regions	Forest fire on 100%
ixed species environmental planting	Wildfire - trees killed	All regions	Forest fire (clearing)
ixed species environmental planting	Wildfire - trees not killed	All regions	Forest fire on 100%
		a	

p crent									-
lame Site prep:	Windrow an	d burn					<u>Auto Nam</u>	e	<u>о</u> к
ype Forest fire	•	•	Notes				Usage		<u>C</u> ance
Timing									
Simulate	Caler	ndar date			Days	0	Add Days		
Forest Fire								(~ ` ` ` ` ` ` ` ` `
Affected Por	tion		Leaf Regrowth Percer	ntane		An	e Arliustmer	insert	Standard Values
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1001	affected by fir	e e	automatica	ally' regrow i	in year after fi	re 🔲	Enable bioma:	ss based a	age adjustment
			and a frances						
Destination P	ercentage:	s in the Affec	ted Portion						
Destination P Tree	ercentage: ToAtmos.	s in the Affec To Debris	ted Portion Decomposable Debris	To Atmos.	To Inert Soil				
Destination P Tree Stems	Percentage: To Atmos.	s in the Affect	ted Portion Decomposable Debris Deadwood	To Atmos. 60	To Inert Soil				
Destination P Tree Stems Branches	To Atmos.	to Debris	ted Portion Decomposable Debris Deadwood Chopped wood	To Atmos. 60 0	To Inert Soil				
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Destination P Tree Stems Branches Bark Leaves Coarse roots Fine roots	To Atmos.	To Debris 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ted Portion Decomposable Debris Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots	To Atmos. 60 0 100 100 100 0	To Inert Soil 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				
Destination P Tree Stems Branches Bark Leaves Coarse roots Fine roots	To Atmos.	s in the Affect To Debris 0 0 0 0 0 0 0 0	ted Portion Decomposable Debris Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris	To Atmos. 60 0 100 100 10 0 To Atmos.	To Inert Soil				
Destination P Tree Stems Branches Bark Leaves Coarse roots Fine roots	To Atmos.	s in the Affect To Debris 0 0 0 0 0 0 0 0	ted Portion Decomposable Debris Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood	To Atmos. 60 0 100 100 100 0 To Atmos. 60	To Inert Soil 0 0 0 0 0 0 0 To Inert Soil 0				
Destination P Tree Stems Branches Bark Leaves Coarse roots Fine roots	To Atmos. 0 0 0 0	s in the Affect To Debris 0 0 0 0 0 0 0	ted Portion Decomposable Debris Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood Chopped wood	To Atmos. 60 0 100 100 10 0 To Atmos. 60 0	To Inert Soil 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				
Destination P Tree Stems Branches Bark Leaves Coarse roots Fine roots	To Atmos. 0 0 0 0	s in the Affec To Debris 0 0 0 0 0 0 0 0 0 0 0 0 0	ted Portion Decomposable Debris Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood Chopped wood Bark litter	To Atmos. 60 0 100 100 100 10 0 To Atmos. 60 0 100	To Inert Soil 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				
Destination P Tree Stems Branches Bark Leaves Coarse roots Fine roots	To Atmos. 0 0 0 0	s in the Affec To Debris 0 0 0 0 0 0 0 0 0 0 0 0 0	ted Portion Decomposable Debris Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood Chopped wood Bark litter Leaf litter	To Atmos. 60 0 100 100 100 100 0 To Atmos. 60 0 100 100 100 100 100 100 1	To Inert Soil 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				
Destination P Tree Stems Branches Bark Leaves Coarse roots Fine roots	To Atmos. 0 0 0 0	s in the Affec To Debris 0 0 0 0 0 0 0 0 0 0 0 0 0	ted Portion Decomposable Debris Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots	To Atmos. 60 100 100 10 0 To Atmos. 60 0 100 100 100 100 100 100 1	To Inert Soil 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				

3.10.5.3 Adding a prescribed fire event – to reduce fire risk

These steps must be repeated for each prescribed fire event aimed at reducing fuel loads and hence fire risk, that occurs in a CEA during the simulation period. A prescribed fire is used to control the accumulation of the debris pool. For each of these events the date must reflect the date of that event.

Simulation Type	Steps required
C100_5%	Not permitted
C10	Not permitted
Default baseline	Not permitted
Historic baseline	Not permitted
Hybrid baseline	Not permitted
Project carbon	1. Click on the 'New' button to create a new event.
	2. Insert the date of the prescribed fire in the simulation period in the
	blank field beside the 'Timing' section.
	3. In the drop down menu next to 'Type', select 'Forest fire'.
	4. Click 'Insert standard values'. Select the row with 'Event Name' of
	'Prescribed burn' and then click 'OK' and 'Yes' to insert the name of
	the standard event.
	5. Tick the 'Enable biomass based age adjustments' box.
	6. Do NOT change any other setting.
	7. Click 'OK' to finish adding the event to the event queue.

) Event						
lame					Auto Name	ОК
ype Forest fire	•	Notes			Usage	Cancel
iming						0
Simulate	Calendar date	✓ 23 Nov 2016	Ĩ	Days 0	Add Days	
Affected Portion Perce affect Perce affect Perce affect Perce affect Perce affect Perce Pe	ntage of forest ed by fire ntages in the Affect Atmos. To Debris	Leaf Regrowth Percert automatical sted Portion Decomposable Debris Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots ResistantDebris Deadwood Chopped wood Bark litter	ntage e of leaves ally' regrow i To Atmos.	that n year after fire	Inse Age Adjustment	t Standard Values
		Coarse dead roots Fine dead roots				
) Select A Stand	ard Event					-
Species 7		Event Name		Event I	Label	Event Description
Mixed species envir Mixed species envir Mixed species envir	ronmental planting ronmental planting ronmental planting ronmental planting	Prescribed burn Site prep: Broadcast Bi Site prep: Windrow and Wildfire - trees killed	um i bum	All regio All regio All regio All regio	ons ons ons ons	Forest fire on 100% Forest fire on 100% Forest fire on 100% Forest fire (clearing)

0

ОК

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In Proportion							
ame riescibe	d burn					Auto Name	е 🥵 ОК
Type Forest fire	9	•	Notes			Usage	Cance
Timing							
🔽 Simulate	Caler	ndar date	✓ 23 Nov 2016		Days 0	Add Days	
Forest Fire							levent Obresdand Veluna
Affected Por	tion		Leaf Regrowth Percen	itage		Age Adjustment	Insert Standard Values
100	Percentage o	of forest	7 Percentage	of leaves	that	Enable biomass	s based age adjustment
	affected by fi	re	automatica	illy' regrow	in year after fire		
Destination F	^v ercentage	s in the Affe	cted Portion				
Destination F	Percentage To Atmos.	s in the Affer To Debris	cted Portion Decomposable Debris	To Atmos.	To Inert Soil		
Destination F Tree Stems	Percentage To Atmos.	to Debris	cted Portion Decomposable Debris Deadwood	To Atmos. 15	To Inert Soil		
Destination F Tree Stems Branches	Percentage To Atmos.	To Debris	cted Portion Decomposable Debris Deadwood Chopped wood	To Atmos. 15 0	To Inert Soil		
Destination F Tree Stems Branches Bark	Percentage To Atmos. 0 0 2	To Debris	cted Portion Decomposable Debris Deadwood Chopped wood Bark litter	To Atmos. 15 0 80	To Inert Soil		
Destination F Tree Stems Branches Bark Leaves	To Atmos. 0 0 2 2 2	to Debris	cted Portion Decomposable Debris Deadwood Chopped wood Bark litter Leaf litter	To Atmos. 15 0 80 90	To Inert Soil 0 0 0 0 0 0		
Destination F Tree Stems Branches Bark Leaves Coarse roots	Percentage To Atmos. 0 0 2 2 2	s in the Affect To Debris 0 0 0 5 0	cted Portion Decomposable Debris Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots	To Atmos. 15 0 80 90 0	To Inert Soil 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		
Destination F Tree Stems Branches Bark Leaves Coarse roots Fine roots	Percentage To Atmos. 0 0 2 2 2	To Debris To Debris 0 0 0 5 0 0 0 0 0 0	cted Portion Decomposable Debris Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots	To Atmos. 15 0 80 90 0 0	To Inert Soil 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		
Destination F Tree Stems Branches Bark Leaves Coarse roots Fine roots	To Atmos. 0 0 2 2	s in the Affect To Debris 0 0 0 0 5 0 0 0	Cted Portion Decomposable Debris Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris	To Atmos. 15 0 80 90 0 0 0	To Inert Soll 0 0 0 0 0 0 0 0 0 0 0 0 0 0 To Inert Soll		
Destination F Tree Stems Branches Bark Leaves Coarse roots Fine roots	To Atmos. 0 0 2 2	To Debris To Debris O O O O O O O O O O O O O O O O O O O	Cted Portion Decomposable Debris Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood	To Atmos. 15 0 80 90 0 0 0 70 Atmos. 15	To Inert Soil 0 0 0 0 0 0 0 0 0 0 0 0 0		
Destination F Tree Stems Branches Bark Leaves Coarse roots Fine roots	To Atmos.	To Debris To Debris O O O O O O O O O O O O O O O O O O O	Cted Portion Decomposable Debris Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood Chopped wood	To Atmos. 15 0 80 90 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	To Inert Soil 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		
Destination F Tree Stems Branches Bark Leaves Coarse roots Fine roots	To Atmos.	s in the Affect	cted Portion Decomposable Debris Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood Chopped wood Bark litter	To Atmos. 15 0 80 90 0 0 0 0 70 Atmos. 15 0 80	To Inert Soil 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		
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3.10.5.4 Adding a wildfire – trees not killed event

These steps must be repeated for each 'wildfire – trees not killed' event that occurs in a CEA during the simulation period. For each wildfire – trees not killed event the date must be the date on which the event occurred.

Simulation Type	St	eps required
C100_5%	•	Not permitted
C10	•	Not permitted
Default baseline	•	Not permitted
Historic baseline	•	Not permitted
Hybrid baseline	•	Not permitted
Project carbon	1.	Click on the 'New' button to create a new event.
	2.	Insert the date of the wildfire where trees are not killed in the
		simulation period in the blank field beside the 'Timing' section.
	3.	In the drop down menu next to 'Type', select 'Forest fire'.
	4.	Click 'Insert standard values'. Select the row with 'Event Name' of
		'Wildfire – trees not killed' and then click 'OK' and 'Yes' to insert the
		name of the standard event.
	5.	Tick the 'Enable biomass based age adjustments' box.
	6.	Do NOT change any other setting.
	7.	Click 'OK' to finish adding the event to the event queue.

Event				
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ype Forest fire	▼ Notes		Usage	Cancel
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Simulate Calenda	ar date 🔹 1 Aug 2017	Days 0	Add Days	
orest Fire			(Inco	t Stradard Values 2
Affected Portion	Last Remove Persont	200	Area Arliustment	It Standard Values
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Percentage of to affected by fire	orest Percentage ('automatically	of leaves that v' regrow in year after fire	Enable biomass based	age adjustment
D. W. W. D. L. M.	at a fill and a fill a stress			
Jestination Percentages in	n the Arrected Portion			
To Atmos. T	o Debris Decomposable Debris T	o Atmos. To Inert Soil		
Stems	Deadwood			
Branches	Chopped wood			
Bark	Bark litter			
Leaves	Leaf litter			
Coarre mote	Coarre dead roots	(1 <u></u>		
Coalse Tools	Coalse dead loois			
FINE ROOLS	Fine dead roots			
	ResistantDebris	Alman Taland Cail		
		Atmos. To ment Soli		
	Deadwood			
	Chopped wood			
	Bark litter			
	Leaf litter			
	Coarse dead roots			
	Fine dead roots			
Select A Standard Even	t			×
Canadian (Event Name	Event 1 al		Event Desertation
Species /	Event Name	Event Lat		Event Description
Mixed species environmental	I planting Frescribed burn	All regions	5	Forest fire on 100%
Mixed species environmental	I planting Site prep: bloadCast buff	um All regions	8	Forest fire on 100%
Mixed species environmental	I planting Wildfire - trees killed	All regions	5	Forest fire (clearing)
			The feature of the second s	

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Cancel

ne Wildfire -	trees not kille	ed					Auto Name	e 😮	C
pe Forest fin	e	•	Notes				Usage		Car
iming									
Simulate	Caler	ndar date	▼ 1 Aug 2017]	Days	0 [Add Days]	
orest Fire								Insert Standard Va	dues
Affected Po	rtion		Leaf Regrowth Perce	ntage		Ag	e Adjustmeni	t	
100	Percentage of	of forest	100 Percentag	e of leaves	that		Enable biomas	s based age adjustme	nt
	affected by fi	re	'automatic	ally' regrow	in year after fin	e			
estination I	Percentage	s in the Affec	ted Portion						
Tree	To Atmos	To Debris	Decomposable Debris	To Atmos.	To Inert Soil				
nee	i o / citio o.								
Stems	5	0	Deadwood	25	0				
Stems Branches	5	0	Deadwood Chopped wood	25 0	0				
Stems Branches Bark	5 10 5	0 0 0 0	Deadwood Chopped wood Bark litter	25 0 100	0 0 0				
Stems Branches Bark Leaves	5 10 5 80	0 0 0 20	Deadwood Chopped wood Bark litter Leaf litter	25 0 100 100	0 0 0				
Stems Branches Bark Leaves Coarse roots	5 10 5 80	0 0 0 20 5	Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots	25 0 100 100 20	0 0 0 0 0				
Stems Branches Bark Leaves Coarse roots Fine roots	5 10 5 80	0 0 20 5 0	Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots	25 0 100 100 20 0	0 0 0 0 0 0				
Stems Branches Bark Leaves Coarse roots Fine roots	5 10 5 80	0 0 20 5 0	Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots	25 0 100 100 20 0	0 0 0 0 0 0				
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Stems Branches Bark Leaves Coarse roots Fine roots	5 10 5 80	0 0 20 5 0	Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood	25 0 100 20 0 To Atmos. 25	0 0 0 0 0 0 0 0 0 0 0 0				
Stems Branches Bark Leaves Coarse roots Fine roots	5 10 5 80	0 0 20 5 0	Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood Chopped wood	25 0 100 20 0 To Atmos. 25 0	0 0 0 0 0 0 0 0 0 0 0 0				
Stems Branches Bark Leaves Coarse roots Fine roots	5 10 5 80	0 0 20 5 0	Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood Chopped wood Bark litter	25 0 100 20 0 To Atmos. 25 0 100	0 0 0 0 0 0 0 0 0 0 0 0 0 0				
Stems Branches Bark Leaves Coarse roots Fine roots	5 10 5 80	0 0 20 5 0	Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood Chopped wood Bark litter Leaf litter	25 0 100 20 0 To Atmos. 25 0 100 100	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				
Stems Branches Bark Leaves Coarse roots Fine roots	5 10 5 80	0 0 20 5 0	Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots	25 0 100 20 0 To Atmos. 25 0 100 100 20	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				

3.10.5.5 Adding a wildfire – trees killed event

These steps must be repeated for each wildfire – trees killed event that occurs during the simulation period and for each wildfire – trees killed event the date must be the date on which the event occurred.

Simulation Type	Steps required
C100_5%	Not permitted
C10	Not permitted
Default baseline	Not permitted
Historic baseline	Not permitted
Hybrid baseline	Not permitted
Project carbon	1. Click the 'New' button to create a new event.
	2. Insert the date that the wildfire – trees killed event in the blank field beside the 'Timing' section. This will need to be entered in the format dd mmm yyyy.
	3. In the drop down menu next to 'Type', select 'Forest Fire'.
	4. Click 'Insert standard values'. Select the row with 'Event Name' of 'Wildfire – trees killed' and then click 'OK' and 'Yes' to insert the name of the standard event.
	5. Click 'OK'.
	6. Do NOT change any other settings.
	7. Click 'OK' to finish adding the event to the event queue.

ame							Auto Name	COK
ype Forest fire		•	Notes				Usage	Cancel
Timing								0
🔽 Simulate	Caler	ndar date	•	25 Feb 2016]	Days 0	Add Days	
orest Fire								t Standard Values 8
Affected Portic	n		Leaf R	egrowth Perce	ntage		Age Adjustment	It Standard Values
Pe	rcentage o	f forest		Percentag	e of leaves	that	Enable biomass based	age adjustment
dir	ected by II	e		automatic	ally regrow	in year aller nie		ł
Destination Per	centage	s in the Affe	cted Porti	ion				
Tree	To Atmos.	To Debris	Deco	omposable Debris	To Atmos.	To Inert Soil		
Stems			D	eadwood				
Branches		-	C	hopped wood				
Bark			B	ark litter				
Leaves		-	L	eaf litter	-			
Coarse roots			C	oarse dead roots				
Fine roots			Fi	ne dead roots				
			Resis	stantDebris	To Atmos.	To Inert Soil		
			D	eadwood	-			
			C	hopped wood	-			
			B	ark litter				
			Le	e <mark>af litte</mark> r				
			C	oarse dead roots				
			Fi	ne dead roots				
			Fi	ne dead roots				
Select A Star	ndard Eve	ent						— ———————————————————————————————————
Species /			Event N	lame		Event Lat	bel	Event Description
Mixed species er	nvironmen	tal planting	Prescrib	ed burn		All regions	8	Forest fire on 100%

pecies /	Event Name	Event Label	Event Description
Aixed species environmental planting	Prescribed burn	All regions	Forest fire on 100%
Aixed species environmental planting	Site prep: Broadcast Burn	All regions	Forest fire on 100%
lixed species environmental planting	Site prep: Windrow and burn	All regions	Forest fire on 100%
lixed species environmental planting	Wildfire - trees killed	All regions	Forest fire (clearing)
Aixed species environmental planting	Wildfire - trees not killed	All regions	Forest fire on 100%
		~	

me Wildfire -	trees killed						Auto Name	0	
pe Forest fir	e		Notes				Usage	7	
ming To the	Color	a da se d		÷.	Dava	0			
/ Simulate	Cale	ndar date	23 160 2016		Days	v (Add Days		
Time								-	
prestrire								Insert Standard	d Values
Affected Po	rtion		Leaf Regrowth Percer	ntage		Age	e Adjustment		
100	Percentage of	of forest	0 Percentag	e of leaves	that in year after fire		Enable biomass	based age adjus	tment
	anootod by n		Batomator	any regreti	in your altor mo				
estination I	Percentage	s in the Affe	cted Portion						
Tree	To Atmos	To Debris	Decomposable Debris	To Atmos.	To Inert Soil				
Stems	10	90	Deadwood	25	0				
Stems Branches	10 20	90 80	Deadwood Chopped wood	25 0	0				
Stems Branches Bark	10 20 10	90 80 90	Deadwood Chopped wood Bark litter	25 0 100	0 0 0				
Stems Branches Bark Leaves	10 20 10 80	90 80 90 20	Deadwood Chopped wood Bark litter Leaf litter	25 0 100 100	0 0 0 0				
Stems Branches Bark Leaves Coarse roots	10 20 10 80	90 80 90 20 100	Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots	25 0 100 100 20	0 0 0 0 0				
Stems Branches Bark Leaves Coarse roots Fine roots	10 20 10 80	90 80 90 20 100 100	Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots	25 0 100 100 20 0	0 0 0 0 0				
Stems Branches Bark Leaves Coarse roots Fine roots	10 20 10 80	90 80 90 20 100 100	Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots ResistantDebris	25 0 100 100 20 0	0 0 0 0 0 0 0				
Stems Branches Bark Leaves Coarse roots Fine roots	10 20 10 80	90 80 90 20 100 100	Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood	25 0 100 20 0 To Atmos. 25	0 0 0 0 0 0 0 0 0 0				
Stems Branches Bark Leaves Coarse roots Fine roots	10 20 10 80	90 80 90 20 100 100	Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood Chooped wood	25 0 100 20 0 To Atmos. 25 0	0 0 0 0 0 0 0 0 0 0 0				
Stems Branches Bark Leaves Coarse roots Fine roots	10 20 10 80	90 80 90 20 100	Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood Chopped wood Bark litter	25 0 100 20 0 To Atmos. 25 0 100	0 0 0 0 0 0 0 0 0 0 0 0				
Stems Branches Bark Leaves Coarse roots Fine roots	10 20 10 80	90 80 90 20 100	Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood Chopped wood Bark litter Leaf litter	25 0 100 20 0 To Atmos. 25 0 100 100	0 0 0 0 0 0 0 0 0 0 0 0 0				
Stems Branches Bark Leaves Coarse roots Fine roots	10 20 10 80	90 80 90 20 100 100	Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots	25 0 100 20 0 To Atmos. 25 0 100 100 20	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				

3.10.6 Creating and cloning regimes

For default, historic and hybrid baselines, the entire events queue that includes all simulated events for the entire baseline management event scenario (see section 4.12 of the Determination) must be cloned to cover the 100 year baseline forecast period.

Simulation Type	Steps required
Default baseline	 Follow the above steps to create a plot and the events forming a single clearing interval of 15 years (regeneration, management fire where applicable and clearing). By default, FullCAM will create a new regime for each event added. Highlight each of the existing regimes in the left hand column by
	 holding ctrl on the keyboard and clicking on each regime. Select the 'Edit' button under the Regime Editing header. In the name field type 'baseline', then click 'ok'. This will combine all existing events under one regime.
	 Press the 'Clone' button under the Regime Editing header. Enter '15' for calendar years and for 'number of times', a value high enough to clone events over the entirety of the 100-plus year baseline period and click 'ok'.
	• Any events that are highlighted grey towards the bottom of the events queue fall beyond the 100-plus year modelling period and will not be simulated. These can be left in the event queue as they will not affect the simulation.
Historic baseline	• Follow the above steps to create a plot and the events forming the two clearing intervals of the durations supported by historical evidence.

	• Highlight each of the existing regimes in the left hand column by
	holding ctrl on the keyboard and clicking on each regime.
	 Select the 'Edit' button under the Regime Editing header.
	• In the name field type 'baseline', then click 'ok'. This will combine all
	existing events under one regime.
	 Calculate the number of years between the first event of the first interval and the last event of the second interval. Add 1 to this number. Ie. years between initial regeneration event modelled and the last clearing event modelled plus 1. Press the 'Clone' button under the Regime Editing header. Enter the number calculated above for 'calendar years' and for 'number of times', a value high enough to clone events over the entirety of the 100-plus year baseline period and click 'ok'. Any events that are highlighted grey towards the bottom of the events queue fall beyond the 100-plus year modelling period and will not be
	simulated. These can be left in the event queue as they will not affect the simulation.
Hybrid baseline	 Follow the above steps to create a plot and the events forming the first clearing interval of 15 years, and the second clearing interval of the duration supported by historical evidence. By default, FullCAM will create a new regime for each event added. Highlight each of the existing regimes in the left hand column by holding ctrl on the keyboard and clicking on each regime. Select the 'Edit' button under the Regime Editing header. In the name field type 'baseline', then click 'ok'. This will combine all existing events under one regime. Calculate the number of years between the first event of the first interval and the last event of the second interval. Add 1 to this number. Ie. years between initial regeneration event modelled and last clearing event plus 1. Press the 'Clone' button under the Regime Editing header. Enter the number calculated above for 'calendar years' and for 'number of times', a value high enough to clone events over the entirety of the 100-plus year baseline period and click 'ok'. Any events that are highlighted grey towards the bottom of the events queue fall beyond the 100-plus year modelling period and will not be simulated. These can be left in the event queue as they will not affect the simulation.
C10	Not applicable
C100_5%	
Project carbon	



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bout Configuration Timing utput Windows Explorer Log	Data Builder Site Trees	Soil Initial C	Conditions Events	
Regime Editing ?	Event Editing New Clone Edit	Status Ready	# events in queue 3 Simulating 3 Non-simulating 0	9
# regimes in queue 1 unique 1	Sort by system Only show simulating events Sort by whether simulating	Initial condition No trees.	15	
Baseline	▼ Date Name		Notes	
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~ 12 months an 2030 Baseline		1 Jan 2015 1 Jan 2022 1 Jan 2029	Plant trees: Mixe Management Fi Initial clearing: r	ed species environmental plant re no product recovery	ling
~ 12 montes an 2045 Baseline		5 Jan 2030 5 Jan 2037 5 Jan 2044	Plant trees: Mixe Management Fi Initial clearing: r	ed species environmental plant re no product recovery	ling
~ 12 months an 2060 Baseline		5 Jan 2045 5 Jan 2052 5 Jan 2059	Plant trees: Mixe Management Fi Initial clearing: r	ed species environmental plant re 10 product recovery	ling
~ 12 months an 2075		5 Jan 2060 5 Jan 2067 5 Jan 2074	Plant trees: Mixe Management Fi Initial clearing: r	ed species environmental plant re 10 product recovery	ting
~ 12 months an 2090		5 Jan 2075 5 Jan 2082 5 Jan 2089	Plant trees: Mixe Management Fi Initial clearing: r	ed species environmental plant re 10 product recovery	ling
Baseline		5 Jan 2090 5 Jan 2097 5 Jan 2104	Plant trees: Mixe Management Fi Initial clearing: r	ed species environmental plant re 10 product recovery	ting
an 2100 Baseline		5 Jan 2105 5 Jan 2112 5 Jan 2119	Plant trees: Mixe Management Fi Initial clearing: r	ed species environmental plant re no product recovery	ting

3.11 The Output Tab

Simulation	Steps required
Туре	
C100_5% C10	 Double click on 'Output1' listed in the Output Window. Click on the icon at the top of the output window:
Historic	. (D) FullCAM_testing_Sep2016_NFMR1.plo - Output 1
baseline Hybrid baseline Project carbon	 Selected outputs have a tick next to their entry, and on the folder(s) where they are located. Unselect all items so that the text reads '0 outputs selected'.
C100_5% C10	 Select the tree carbon pools: Carbon / Forest / Plants / C mass of trees. Click 'OK'.
Default baseline Hybrid baseline Historic baseline	 Select the tree carbon pools: Carbon / Forest / Plants / C mass of trees. Select the debris carbon pools: Carbon / Forest / Plants / C mass of debris. Click 'OK'.
Project carbon	 Select the tree carbon pools: Carbon / Forest / Plants / C mass of trees. Select the debris carbon pools: Carbon / Forest / Debris / C mass of forest debris. Select the CH₄ emissions from fire: Carbon / Whole / Emissions / CH4 emitted due to fire. Select the N₂O emissions from fire: Nitrogen / Whole / Emissions / N2O emitted due to fire. Click 'OK'.

() Select Outputs		×
Carbon Carbon Origin Nitrogen Other		
0 outputs selected, from the 1/9 available	Cancel	



3.12 Running Simulations

To run the simulation, press the icon in the top menu bar:

3.13 Viewing outputs

<u>Outputs</u> can be viewed by clicking the icon (circled) at the top of the Output window as either:

8. Graph

FullCAM_testing_Sep2016_NFMR1.plo - Output 1
 □ □ ■

9. Tabular form

3.14 Transferring outputs into a spreadsheet

To transfer data into a Microsoft Excel or equivalent spreadsheet for analysis:

Copy all the output data by clicking on the icon (circled) in the top of the Output window.

() FullCAM_testing_Sep2016_NFMR1.plo - Output 1	
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Open Microsoft Excel (or equivalent spreadsheet software), and 'Paste' the data copied from FullCAM into the spreadsheet. For example:

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7	2015, Apr 30)	0	0	0	0														
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	1202 2116, Oct 31	13.75 0	4.32	0					
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Default baseline	•	Refer to Division 4.4 of the Determination for calculating baselines,
Historic		specifically Equation 4 at section 4.24. Section 5 of these Guidelines details
baseline		how each FullCAM output in the spreadsheet data corresponds to the
Hybrid baseline		equation parameters.
Project carbon	•	Refer to Division 4.4 of the Determination for calculating end of reporting
		period Project carbon stocks, specifically Equation 2 at section 4.22. Section
		5 of these Guidelines details how each FullCAM output in the spreadsheet
		data corresponds to the equation parameters.

4. FullCAM simulations and offsets reporting

Project proponents must calculate the project net abatement by completing the equations in sections 4.21 to 4.29 of the Determination. Parameters generated in FullCAM are used in Equations in the Determination.

Note that for some of the equations the average of the FullCAM output over the simulation period will be required, whereas for others the value of the FullCAM output at the end of the simulation period will be used. Refer to the equations within the Determination to determine which value to use. Averages can be calculated using the average function within your spreadsheet software.

FullCAM Output	Parameter as defined in the Determination	Scenario	Equation in the determination	
C mass of debris	CD _{CEA,i}	Project	3	
	BCD _{CEA,i,k}	Baseline	4	
C mass of trees	CT _{CEA,i}	Project	3	
	BCT _{CEA,i,k}	Baseline	4	
CH ₄ emitted from debris due to fire	E _{CH4} ,i	Project	7	
N ₂ O emitted due to fire	E _{N2} 0,i	Project	8	

Table 7: FullCAM outputs and Corresponding Parameters as defined in the Determination



Australian Government

Department of the Environment and Energy

FullCAM Guidelines

Requirements for using the Full Carbon Accounting Model (FullCAM) in the Emissions Reduction Fund (ERF) methodology determination:

Carbon Credits (Carbon Farming Initiative) (Native Forest from Managed Regrowth) Methodology Determination 2013

Version 2.1

(published and in force from xx May 2017)

Disclaimer

This document has been developed to assist project proponents to calculate abatement in FullCAM as required by the *Carbon Credits (Carbon Farming Initiative) (Native Forest from Managed Regrowth) Methodology Determination 2013.* This document is incorporated by reference in sections 1.3, 4.8, 4.9, 4.12, 4.14, 4.16, 4.18, 4.19, 4.30 and 5.3 of that determination. Project proponents should not use this document as a substitute for complying with the requirements in the Methodology Determination.

Before relying on any material contained in this document, project proponents should familiarise themselves with the requirements of the following legal documents: <u>Carbon Credits (Carbon Farming Initiative) (Native</u> Forest from Managed Regrowth) Methodology Determination 2013, <u>Carbon Credits (Carbon Farming Initiative)</u> Act 2011, <u>Carbon Credits (Carbon Farming Initiative) Rule 2015</u> and <u>Carbon Credits (Carbon Farming Initiative)</u> Regulations 2011. Project proponents are also advises to obtain professional advice suitable to their particular circumstances.

This document does not displace relevant legislative provisions or other laws. All users are encouraged to read this document in conjunction with the relevant legislation, including the methodology determinations, referenced throughout this document. Where any inconsistencies are apparent, please be aware that the legislative provisions will take precedence.

This document will be updated periodically and users should note that some inputs and values may change over time. It is the user's responsibility to ensure that they are using the version of this document and any tool/s required in association as in force at the applicable offsets report submission date (consistent with the definitions in section 1.3 of the Methodology Determination).

The Department of the Environment and Energy and the Commonwealth of Australia will not be liable for any direct, indirect or consequential loss arising out of, or in connection with, or reliance on, information on, or produced by, using this document.

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1. Introduction

1.1 Use of FullCAM with the Native Forest from Managed Regrowth Methodology Determination 2013

The calculation of carbon abatement under the <u>Carbon Credits (Carbon Farming Initiative) (Native</u> <u>Forest from Managed Regrowth) Methodology Determination 2013</u> (the Determination) is dependent upon the use of the Full Carbon Accounting Model (FullCAM) consistently with the requirements of this document. In particular, sections 4.8, 4.9, 4.12, 4.14, 4.16, 4.18 and 4.19 of the Determination require that the materiality test, baseline scenario and project scenario for each carbon estimation area must be modelled in FullCAM in accordance with the requirements in both the Determination and this document.

Section 4.18 of the Determination requires that any project-specific inputs specified in this document must be used to determine the project carbon stocks for a carbon estimation area. Note that each of the simulations and modelling events detailed in this document have specific inputs that must be used. In effect, proponents are required to model project carbon stocks reflecting actual management events for the entirety of the simulation period.

Section 4.30 and 4.31 of the Determination also requires key input and output data to be produced using FullCAM in accordance with the requirements in the Determination and this document. Where content of this document relates to provisions of the Determination, references are given to the location of those provisions.

Project proponents must only change FullCAM default settings as indicated in this document, and all other settings must not be changed. This is to ensure that defaults will apply where relevant.

The latest version of FullCAM is available for download from <u>www.environment.gov.au/climate-change/greenhouse-gas-measurement/land-sector</u>. You should check the Determination to determine which version of FullCAM you are required to use for your applicable offsets report. If you determine that you must use a version of FullCAM that is unavailable on the website, please contact the Department at <u>erfforests@environment.gov.au</u> to obtain a copy.

1.2 Format of this document

This document provides:

- an overview of FullCAM relevant to the Determination;
- an overview of the simulations you must run in FullCAM as per the Determination;
- a step-by-step walkthrough of using FullCAM to run the simulations correctly; and
- an overview of the FullCAM outputs as they relate to equations within the Determination.

Section 1 of this document provides an overview of FullCAM, its features relevant to users and important requirements for using this document. Section 2 outlines the process used to determine which type of baseline proponents must use in accord with the Determination. Section 3 provides a step-by-step walkthrough of how to run FullCAM 'simulations' for the materiality test, baselines, and project reporting.

Section 2 includes tables summarising the simulations that users may be required to run in FullCAM. These tables summarise the objective, time period and outputs for each simulation, as well as the project activities that may need to be simulated. Where settings differ between different simulation types for the step-by-step process, section 3 outlines the separate parameters required. Users should familiarise themselves with the simulations in section 2 before following the steps in section 3 to run the simulations. Section 4 provides an overview of the FullCAM outputs needed to complete the equations within the Determination.

1.3 FullCAM background

FullCAM is used in Australia's National Greenhouse Gas Accounts for the land sector. FullCAM provides fully integrated estimates of carbon pools in forest and agricultural systems for Australia's land sector reporting. In addition, it accounts for human-induced changes in emission and sequestration of major greenhouse gases. FullCAM was developed under the National Carbon Accounting System (NCAS) at the then Australian Greenhouse Office to provide a dynamic account of the changing stocks of carbon in Australia's land systems since 1970 by integrating data on land cover change, land use and management, climate, plant productivity, and soil carbon over time. FullCAM estimates carbon stock change and greenhouse gas emissions at fine spatial and temporal scales, and uses a wide range of spatially referenced data.

Users of FullCAM can determine estimates of carbon stock change and greenhouse gas emissions for ERF projects on a similar basis to that used for land use and land use change in Australia's National Greenhouse Gas Inventory.

1.4 FullCAM plots and running simulations

FullCAM can run simulations on a 'plot'. A plot, for modelling purposes, is defined as a piece of land for which the event history, when modelled in FullCAM, is the same across that area of land. Separate plot files are created for each CEA.

In FullCAM, there are several types of plots that can be selected. Only 'forest system' is relevant to this Determination. This document provides overviews of the simulations that users may be required in Section 2, and the steps to run these simulations in Section 3.

FullCAM models using a single 'model point' location. Proponents do not need to define plot boundaries within FullCAM, rather proponents must input the coordinates for a single location within the plot boundaries that is at the approximate centre of the plot (the model point – see paragraph 3.3(1)(c) of the Determination). The latest spatial data for a plot must be downloaded using the 'Data Builder' tab each time the software is run. This process is described in section 3.5 of this document.

Separate plot files must be created for each carbon estimation area (CEA) (see section 3.3 of the Determination). In order to ensure all settings are correct, including defaults, we recommend creating new plot files each time a new version of FullCAM or these Guidelines is used. Plot files created under previous versions may contain different settings that will affect outputs and users are responsible for any inconsistencies.

For each CEA, separate plot files must be created for:

- determining whether a zero baseline or non-zero baseline must be used (initial reporting period only);
- estimating carbon stocks under a non-zero baseline (if a zero baseline is not appropriate); which may be either a 'default' baseline, an 'historic' baseline or an 'hybrid' baseline;
- estimating carbon stocks for the current reporting period; and
- determining if a disturbance event must be reported prior to the next reporting period.

1.5 Overview of the FullCAM interface

The FullCAM software user interface displays menus and a series of tabs. Each tab has a suite of fields in which information may either be required to complete as instructed in section 3 or left unchanged. The program is designed so that certain tabs in a plot file are made available only if required fields have valid information entered in earlier tabs. If the text of a tab or field is red, then FullCAM requires information in that tab or field before a simulation can be run. When all the required fields within a tab have valid information entered, the tab text will become blue. Help is provided within FullCAM by clicking on the gran symbol available in most windows. A general overview of each tab follows.

Tab	Explanation
About	Includes a free text field where users can enter information about the plot file that
	they have created. This is a good space to keep track of changes that have been
	made or editing of event parameters.
Configuration	Users select the system (e.g. forest, agricultural) they want to simulate in the plot.
Timing	Enter the timing for starting and ending the simulation and the time steps required
	for output data.

There are only three tabs users see when they create a new FullCAM plot:

Once fields in the above three tabs are populated users can access the following additional tabs:

Tab	Explanation
Data	In this tab users enter the latitude and longitude of the 'Model Point Location'
Builder	where they wish to simulate a plot file. Internet access is required to complete this
	tab. By choosing to 'Download Spatial Data' the associated soil and climate data for
	that latitude and longitude are automatically loaded into relevant parts of the
	remaining tabs. In the tab users can then download tree and/or crop species
	information and management regimes as appropriate. This information is also
	automatically loaded into relevant parts of the remaining tabs.
Site	Specific parameters (e.g. water [rainfall], temperature, productivity) are described.
Trees	Description of the properties of the tree species.
Crops	Description of the properties of crop or pasture species (only displays if agricultural
	system selected).
Soil	Description of soil properties.
Initial	In this tab the values for carbon at the start of the simulation are described. Values
Conditions	will automatically be populated by Data Builder using data downloaded from the
	FullCAM server.
Events	All of the events for the entire simulation period are listed in this tab. Users can add
	or remove events. Care must be taken not to violate requirements for modelling
	'management events' within the Determination. The names on the event list are

	colour-coded to indicate whether they are ready, whether they are simulating or not, and what system they affect. The colour codes are:
	<u>Red:</u> Event not ready (renders event queue not ready); <u>Grey:</u> Event non-simulating (outside simulation period, will not affect simulation); <u>Green:</u> Forest; <u>Yellow:</u> Agricultural; and <u>Brown:</u> Mixed.
	Finally, the events users select with the cursor are coloured in the usual highlight colour.
Output	Defines what outputs are presented in output windows.
Window	
Explorer	Display of the parameter settings for each tab.
Log	This tab records changes made to the file to assist with analysis and error tracking.

1.6 Application of this document

This document is the FullCAM Guidelines for the Determination and section 1.3 of the Determination requires the version of this document as in force from time to time (ie the most recent version) to be used in offsets reports. This document includes 2 texts together:

- The New Part made up of sections 1 to 4 of this Document; and
- The *Old Part* made up of the Schedule to this Document containing the FullCAM Guidelines published on 16 December 2016.

If the exception does not apply, the New Part applies.

If the exception applies, the proponent has a choice between the New Part and the Old Part.

The *exception* is the application of this document to an offsets report submitted before 31 December 2017 that needs to be audited and for which the assurance engagement terms were agreed before 1 May 2017.

2. Simulations overview

Sections 4.8, 4.9, 4.12, 4.14, 4.18 and 4.19 of the Determination require that the materiality test, baseline scenario and project scenario for each carbon estimation area must be modelled in FullCAM in accordance with the requirements in both the Determination and this document.

2.1 Baseline scenarios

The baseline for each CEA will be either of two categories depending on the materiality test below (Section 2.2) – a zero baseline or a non-zero baseline.

Within the non-zero baseline category there are three possible baselines depending on the extent of historical information available regarding the clearing history – default, hybrid or historic. The decision flowchart below gives an overview of the process for determining which baseline to use.

Figure 1: Decision tree for determining the type of baseline to be used for each Carbon Estimation Area (CEA). See section 4.12 of the Determination for the relevant provisions.



Start Here

2.2 Baseline materiality test

To determine whether a zero baseline may apply in a CEA, project proponents must complete the materiality test explained by this section and to be undertaken by following Section 3 of this document. Proponents must also comply with the provisions given for the materiality test in sections 4.7-4.9 of the Determination.

Factor	Explanation	Process for Calculating
C100_5%	5 per cent of the 'carbon mass of trees' at 100	see (a) below for how to calculate
	years after the implementation date	
C10 the maximum 'carbon mass of trees' over the ten see (b) below for how to		see (b) below for how to calculate
	years prior to the implementation date	

Completing the materiality test involves calculating two factors:

Note: 'Implementation date' is defined in section 1.3 of the Determination. It is the date when the project mechanism (a change in land management enabling native vegetation to achieve forest cover) was implemented in a CEA. Each CEA may have a different implementation date.

The values calculated for these factors will allow you to determine which baseline to use:

Result	Baseline to use
C10 is less than or equal to C100_5%	Zero baseline
C10 is greater than C100_5%	Non-zero baseline (default, hybrid or historic)

Overview of simulation for calculating C100_5%

 Table 1: Overview of simulation for calculating C100_5%

Objective	Calculate 5 per cent of the 'C mass of trees' at 100 years after the implementation date.
Simulation	From the implementation date to 100 years after the implementation date.
period	
Fuente nemitted	Decemention
Events permitted	Regeneration
Outputs	Monthly totals for 'C mass of trees' (FullCAM Output = Carbon / Forest / Plants
-	/ C mass of trees)

Overview of simulation for calculating C10

Note: When calculating C10, project proponents must have documentary evidence for each event that is entered into the FullCAM event queue.

Table 2: Overview of simulation for calculating C10

Objective Calculate the maximum carbon mass of trees reached during th	
	before the implementation date.
Simulation	From the day after the last comprehensive clearing before the 10 year period
period	that ends on the implementation date to the implementation date.
Events permitted	Regeneration
	Clearing
	Thinning
	Growth pause
	Grazing by livestock
	Management fire
	Windrow and burn
Outputs	Monthly totals for 'C mass of trees' (FullCAM Output = Carbon / Forest / Plants
	/ C mass of trees)

Note: 'comprehensive clearing' is defined in section 1.3 of the Determination. It means the destruction of trees or saplings, or both, by mechanical or chemical means that may be accompanied by use of fire, leaving the land in a non-forested state for pastoral land use.

2.3 Non-zero baselines

Non-zero baselines must be calculated if, according to the materiality test under the previous section, the maximum carbon stock during the ten years prior to the implementation date has reached a material level (i.e. $C10 > C100_5\%$).

Overview of simulation for calculating a Default Baseline

A default non-zero baseline is suitable for project proponents whose records are not sufficient to model either an historic or a hybrid baseline. For further information about default non-zero baselines, see sections 4.12 and 4.15 of the Determination, and pages 19 to 21 and Appendix A of the Explanatory Statement for the <u>original Determination</u>. A default non-zero baseline is modelled in FullCAM by repeating the default baseline management event scenario over the baseline forecast period. This scenario consists of a sequence of comprehensive clearings that occur at 15 year intervals (refer to Table 3).

If project proponents can demonstrate that fire was used to suppress regrowth on land that is part of the same pastoral property as the CEA then:

- a management fire event may be included in each 15 year interval; and
- a 'Windrow and Burn' fire event may be added 6 months after a comprehensive clearing event.

Table 3: Overview of simulation for calculating a Default Baseline

Objective	Calculate the default baseline which estimates average carbon stocks in a carbon estimation area in the absence of an eligible offsets project.		
Simulation	From one day after the last comprehensive clearing event that occurred before the		
period	implementation date. Simulations end 100 years after the implementation date (the		
•	baseline forecast period).		
Events	Cycled every 15 years:		
permitted	Regeneration;		
-	Clearing;		
	• Management fire 7 years after Regeneration event – where sufficient evidence;		
	and		
	Windrow and Burn – where sufficient evidence.		
Outputs	Monthly totals for 'C mass of trees' (FullCAM Output = Carbon / Forest / Plants / C		
	mass of trees)		
	Monthly totals for 'C mass of debris' (FullCAM Output = Carbon / Forest / Debris /		
	mass of forest debris)		

Overview of simulation for calculating a Hybrid Baseline

A hybrid baseline is suitable for project proponents who have evidence of two comprehensive clearings that occurred less than 15 years apart and before the implementation date. For further

information about hybrid baselines, see sections 4.12 and 4.15 of the Determination, and pages 19 to 21 and Appendix A of the Explanatory Statement for the original Determination.

A hybrid baseline is modelled in FullCAM by repeating the hybrid baseline management event scenario over the baseline forecast period. This scenario consists of a sequence of comprehensive clearings that occur at two alternating intervals, one default interval of 15 years, and one historic interval matching the interval between the last two clearings before the implementation date (refer to Table 4).

If project proponents can demonstrate that fire was used to suppress regrowth on land that is part of the same pastoral property as the CEA, then:

- a management fire event may be included in the 15 year *default* interval; and
- a 'Windrow and Burn' fire event may be included 6 months after the comprehensive clearing event at the beginning of the 15 year *default* interval.

If project proponents can demonstrate that fire was used in the second *historic* interval, then that fire event may be included in that interval.

Overview of simulation for calculating a Historic Baseline

Project proponents wishing to model an historic baseline must have evidence for at least three comprehensive clearings that occurred in the carbon estimation area before the implementation date. For further information about historic baselines, see sections 4.12 and 4.15 of the Determination, and pages 19 to 21 and Appendix A of the original Explanatory Statement.

A historic non-zero baseline is modelled in FullCAM by repeating the historic baseline management event scenario over the baseline forecast period. There are stringent evidentiary requirements for modelling an historic baseline. Project proponents must have documentary evidence for each event modelled in the scenario (refer Table 4).

Objective	Calculate historic and hybrid non-zero baselines which estimate average	
	carbon stocks in a carbon estimation area <mark>over 100 years</mark> in the absence of an	
	eligible offsets project. Averages are estimated from the implementation date	
	<mark>until 100 years after the implementation date.</mark>	
Simulation	One day after the most recent comprehensive clearing event. Simulations end	
period	100 years after the implementation date (the baseline forecast period).	
Events permitted	Regeneration	
	Clearing	
	Thinning	
	Management fire	
	Windrow and Burn	
Outputs	Monthly totals for 'C mass of trees' (FullCAM Output = Carbon / Forest / Plants	
	/ C mass of trees)	
	Monthly totals for 'C mass of debris' (FullCAM Output = Carbon / Forest /	
	Debris / C mass of forest debris)	

Table 4: Overview of simulation for calculating a Historic or Hybrid Baseline

2.4 Overview of simulation for calculating project carbon stocks

Project proponents must model all fire, thinning and regeneration events that occurred in the CEA in the current and previous reporting period(s) to determine the project carbon stocks as per section 4.18 of the Determination.

To determine the project carbon stocks, project proponents must model all events listed in the table below that reflect the actual management events that occurred in the CEA during the entirety of the simulation period (from one day after the last comprehensive clearing before the implementation date until the end of the current reporting period).

Objective	Calculate total carbon stocks in each CEA at the end of each reporting period. These carbon stocks will reflect the age of the regrowth within the CEA, observed climate, and activities and disturbance subsequent to the	
	establishment of the offsets project.	
Simulation	From one day after the last comprehensive clearing before the	
period	implementation date. Simulations end at the end of the current reporting	
	period.	
Events permitted	d Regeneration	
	Clearing	
	Thinning	
	Growth pause	
	Grazing by livestock	
	Prescribed fire – to reduce fire risk	
	Wildfires – trees not killed	
	Wildfires – trees killed	
	Management fire	
	Windrow and burn	
Outputs	Monthly totals for 'C mass of trees' (FullCAM Output = Carbon / Forest / Plants	
	/ C mass of trees)	
	Monthly totals for 'C mass of debris' (FullCAM Output = Carbon / Forest /	
	Debris / C mass of forest debris)	
	Monthly totals for emissions of CH ₄ from fire (FullCAM Output = Whole /	
	Emissions / CH₄ emitted due to fire)	
	Monthly totals for emissions of N ₂ O from fire (FullCAM Output = Nitrogen /	
	Whole / Emissions / N ₂ O emitted due to fire)	

Table 5 Overview of simulation for calculating project carbon stocks

3. Setting up simulations for carbon estimation areas

The following steps must be followed for entering data into each tab in a FullCAM plot file. Each table provides a sequential list of steps in the right hand column. The left hand column indicates the Simulation Type that the steps are relevant to. Screenshots relevant to each set of steps, directly follow each table.

3.1 **Opening a file**

Simulation Type	Steps required

C100_5%	•	Open a new plot under the 'File' menu. Enter a name for the plot th	nat
C10		reflects the identifier for the CEA and model scenario, e	e.g.
Default baseline		'CEA1_baseline'.	
Historic baseline			
Hybrid baseline			
Project carbon			

<u>F</u> ile	<u>E</u> dit	Simulate	Inte	ernet	<u>U</u> tilities	Window	<u>H</u> elp	
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	New		ß	New	Plot Ctrl+N	~		
	Close	Ctrl+W	Ē	New	Estate			
	Save Save As . Save Con	Ctrl+S 	Γ					
ø	Save All (Ctrl+Alt+S	Ŀ					
	Exit	Ctrl+Q						

3.2 Saving a plot file

Simulation Type	Steps required
C100_5% C10 Default baseline Historic baseline Hybrid baseline Project carbon	 Save the plot file using the 'File' menu on the FullCAM toolbar. Save the plot file regularly when setting up and running simulations.

File	Edit	Simulate	Internet	<u>U</u> tilities	Window	<u>H</u> elp	
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	New Close	Ctrl+W					
	Save	Ctrl+S					
	Save As						
ø	Save Cop Save All C	y As Ctrl+Alt+S					
	Exit	Ctrl+Q					

3.3 The Configuration Tab

Simulation Type	Steps required
C100_5%	• From the 'Plot' drop down menu, select 'Forest system'.
C10	Do NOT change any other settings.
Default baseline	
Historic baseline	
Hybrid baseline	
Project carbon	

Type F	orest system	1	•	Risk Analysis	8
Include:	Soil and mi	ine		Other Options	9
Method	Tree yield for	mula 🔻			
Calculate	from scratch:	Forest productivity inc Temperature modifier Soil water modifier Frost modifier	tex (FPI)	About Your Configuration Models and Inputs Diagrams	

3.4 The Timing Tab

Simulation Type	Steps required
C100_5% C10	 Set the Simulation Timing to 'calendar'. Set the Output Steps to 'months'.
Default baseline	
Historic baseline	
Hybrid baseline	
Project carbon	
C100_5%	• Enter the date to start simulations as the implementation date.
	• Enter the date to end the simulation as 100 years after the implementation date
C10	Enter the date to start simulations as the day after the last
	comprehensive clearing that occurred before the 10 year period that
	ends on the implementation date. Enter the date to end the
	simulation as the implementation date.
Default baseline	• Enter the date to start simulations as one day after the last
Historic baseline	comprehensive clearing before the implementation date.
Hybrid baseline	• Enter the date to end the simulation as 100 years after the
Project carbon	implementation date.
C100_5%	Do NOT change any other settings.
C10	New tabs will appear once this tab has been completed.
Default baseline	
Historic baseline	
Hybrid baseline	
Project carbon	



3.5 The Data Builder Tab

Simulation Type	Steps required
C100_5% C10	• Check the box to turn on the Data Builder (this requires an internet connection).
Default baseline Historic baseline Hybrid baseline	• Enter the latitude and longitude (in decimal degrees) of the model point location central to the CEA being modelled and not in an exclusion area.
Project carbon	• Click the button to 'Download Spatial Data' and click 'OK' on the information box that pops up.
	• Select 'Mixed species environmental plantings' from the dropdown box for 'Tree species' and then click the button to 'Download This Species' and 'Yes' to 'Make mixed species environmental plantings the initial tree species'. NB: Do NOT use the 'Mixed species environmental plantings temperate' setting.
	Do NOT download a regime (and therefore the events associated with the regime) for this are size.
	De NOT shange any other settings
	 DO NUT change any other settings.

About Configu Output Windows	ration Timing Data Builder Site Explorer Log	Trees Soil	Initial Conditions Events	
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3.6 The Site Tab

Simulation Type	Steps required
C100_5%	Do NOT change any settings.
C10	
Default baseline	
Historic baseline	
Hybrid baseline	
Project carbon	

3.7 The Tree Tab

Simulation Type	Steps required
C100_5%	Do NOT change any settings.
C10	
Default baseline	
Historic baseline	
Hybrid baseline	
Project carbon	

3.8 The Soil Tab

Simulation Type	Steps required
C100_5% C10 Default baseline	Do NOT change any settings.

Historic baseline		
Hybrid baseline		
Project carbon		

3.9 The Initial Conditions Tab

Simulation Type	Steps required	
C100_5%	Click the button labelled 'Trees' and uncheck the box under	
C10	'Existence' to show that the site did not have trees growing on it at	
Default baseline	the start of the simulation. Click 'OK'.	
Historic baseline	• Click the button labelled 'Debris' and change all the default settings	
Hybrid baseline	for each debris pool to zero.	
Project carbon	Do NOT change any other settings.	

CEA1_baseline.plo About Configuration Timing	Data Builder Site Trees Soil Ir	nitial Conditions Events
Output Windows Explorer Lo	bg	
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Bark Ages [yr]		
Leaves Age of oldest trees		
Coarse roots Average age of trees Numbers of Trees		
Fine roots Stems per hect.	are	

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3.10 The Events Tab

The Events Tab is where events for a simulation can be added and displayed in sequence.

Simulation Type	Permitted Events
C100_5%	Regeneration
C10	Regeneration
	Clearing
	Thinning
	Growth pause
	Grazing by livestock
	Management fire
	Windrow and burn fire
Default baseline	Regeneration
	Clearing
	Management fire – where sufficient evidence (see s 4.12 of the Determination)
	Windrow and burn fire – where sufficient evidence (s 4.12 of the Determination)
Historic baseline	Regeneration
Hybrid baseline	Clearing
	Thinning
	Management fire – where sufficient evidence (see s 4.12 of the Determination)
	Windrow and burn fire – where sufficient evidence (s 4.12 of the Determination)
Project carbon	Regeneration
	Clearing
	Thinning
	Growth pause
	Grazing by livestock
	Management fire
	Windrow and burn fire
	Prescribed fire – to reduce fire risk
	Wildfire – trees not killed
	Wildfire – trees killed

Table 6: Permitted Events for each Simulation Type

CEA1_baseline.plo			
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	▼ Date Name	Notes	
Plot Ready to simulate	Events page ready		

3.10.1 Adding a regeneration event

Regeneration events must be added to the FullCAM event queue for each CEA to model the establishment of forest potential after each comprehensive clearing. For project baselines, iI-n the absence of evidence to the contrary, the timing of attainment of forest potential is deemed to occur one year after each comprehensive clearing event. For project baselines, Eevidence is required to set the date of regeneration to any other time after clearing. For project carbon scenarios, the timing of the regeneration event must be supported by evidence. See section 4.6 and subsection 4.19(2) of the Determination for details respectively.

For the default baseline, regeneration events and clearing events should recur on a 15 year cycle for the duration of the simulation (i.e. 12 months from clearing to regeneration plus 14 years of growth prior to re-clearing).

Note: Where there is evidence of regeneration following a wildfire where trees were killed, a regeneration event must be added to the events queue 12 months after each wildfire – trees killed event, unless there is specified evidence to set the date of regeneration to some other time after clearing (See section 4.6 of the Determination).

Note: Where there is evidence of regeneration following a windrow and burn following clearing, a regeneration event must be added to the events queue 6 months after each windrow and burn event.

Simulation	Steps required
Туре	
C100_5% C10 Default baseline	• Click the 'New' button under 'Event Editing' to create a new event.
Historic baseline Hybrid baseline Project carbon	
C100_5%	• Insert the simulation start date in the blank field beside the 'Timing' section. This will need to be entered in the format dd mmm yyyy.
Default baseline	• For the first regeneration event, insert the time when regeneration commenced following the most recent comprehensive clearing event in the blank field beside the 'Timing' section. This will need to be entered in the format dd mmm yyyy. For all other regeneration events insert the date 15 years after the previous regeneration event.
C10 Historic baseline Hybrid baseline Project carbon	• For the first regeneration event, insert the time when regeneration commenced following the most recent comprehensive clearing event in the blank field beside the 'Timing' section. This will need to be entered in the format dd mmm yyyy. For all subsequent regeneration events insert the date for each to represent the observed or default interval between regeneration events.
C100_5% C10 Default baseline Historic baseline Hybrid baseline Project carbon	 In the drop down menu next to 'Type', select 'Plant trees'. Click 'Insert standard values'. Select the row with the 'Event Name' of 'Plant trees: natural regeneration' and then click 'OK' and 'Yes' to insert the name of the standard event. Do NOT change any other setting. Click 'OK' to finish adding the event to the event queue.

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ype Plant trees Notes	Usage	Cancel
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Leaves		
Coarse roots		
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Thes Mein monthlier		

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Jan 2015	
New Regime V Date Name	Notes
12 Jan 2015 Plant trees: na	atural regener.

3.10.2 Adding a clearing event

These steps must be repeated for each clearing event that occurs in each CEA during the simulation period. For each clearing event the date must reflect the date of that clearing event.

Simulation Type	Steps required
C100_5%	Not permitted
Project carbon	Not permitted
C10	• Click the 'New' button under 'Event Editing' to create a new event.
Default baseline	
Historic baseline	
Hybrid baseline	
C10 Historic baseline	• Insert the date of the clearing event in the blank field beside the
Historic baseline	need to be entered in the format dd mmm www. For subsequent
	clearing events, insert the date of clearing in this field to represent
	the observed or default interval between comprehensive clearings.
Default baseline	• Insert the date of the clearing event in the blank field beside the
	'Timing' section. The intervals between events must reflect those that
	occurred historically. This will need to be entered in the format dd
	mmm yyyy. Each clearing event will be 14 years after the previous
C10	regeneration event.
	In the drop down menu next to Type, select Thin .
Default baseline	Click 'Insert standard values'. Select the row with 'Event Name' of (Initial electrics: No product recovery' and then click (OV) and (Ver) to [Initial electrics: No product recovery' and then click (OV) and (Ver) to [Initial electrics: No product recovery' and then click (OV) and (Ver) to [Initial electrics: No product recovery' and then click (OV) and (Ver) to [Initial electrics: No product recovery' and then click (OV) and (Ver) to [Initial electrics: No product recovery' and then click (OV) and (Ver) to [Initial electrics: No product recovery' and the product recovery' are a set of the product recovery' and the product recovery' are a set of t
Historic Daseline	Initial clearing: No product recovery and then click OK and Yes to
	Insert the name of the standard event.
	Ensure that the box next to Affected portion contains the value 100 to indicate a clearing event
	Do NOT change any other settings
	• Do NOT change any other settings.
	 Click UK to linish adding the event to the event queue.

Name Notes Fining Notes Ø Simulate Calendar date 12 Jan 2020 Days 0 Finin Affected Portion Age Adjustment Percentage of forest affected by thin Enable biomass based age adjustment Destination Percentages in the Affected Portion Post-The Log grades Manual Relative Stems to: Branches to: Bark to: 1 Deadwood Deadwood Bark litter 1 Paper and pulp Paper and pulp Paper 1 Packing wood Packing wood Packing wood Leag litter Fine Roots to: Fine dead roots Coarse Roots to: Length of other Mill residue Biofuel Biofuel Biofuel Relead roots Fine Roots to: Fine dead roots Coarse dead roots to: Coarse dead roots to: Average at removed to: Deadwood to: Biofuel Biofuel Biofuel Biofuel Coarse dead roots to: Fine Roots to: Fine dead roots Coarse dead roots to: Coarse dead roots to: Average at removed to: Deadwood to: </th <th></th>	
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3.10.3 Adding a thinning event

These steps must be repeated for each thinning event that occurs in each CEA during the simulation period. For each thinning event the date must reflect the date of the thinning event.

Simulation Type	Steps required
C100_5%	Not permitted
Default baseline	Not permitted
C10	1. Click the 'New' button to create a new event.
Historic baseline	2. Insert the date of the thinning event in the blank field beside the
Hybrid baseline	'Timing' section. This will need to be entered in the format dd mmm
Project carbon	yyyy. The intervals between events must reflect those that occurred
	historically.
	3. In the drop down menu next to 'Type', select 'Thin'.
	4. Click 'Insert standard values'. Select the row with 'Event Name' of
	'Initial clearing: No product recovery' and then click 'OK' and 'Yes' to
	insert the name of the standard event.
	5. In the box next to 'Affected portion – the percentage of forest
	affected by thin' change the number to an estimate of the proportion
	of the stems that were killed in the thinning. You must report on how
	the estimate was derived in your project report.
	6. Do NOT change any other settings.
	7. Click 'OK' to finish adding the event to the event queue.

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				-	Paper	1	Leaves			
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Select A Standard Event				x
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Mixed species environmental planting	Initial clearing: no product recovery		Thin (clearing)	
Mixed species environmental planting	Initial clearing: product recovery		Thin (clearing)	
Mixed species environmental planting	Prune (Selective, 33%)		Thin on 33% (removes 0% of stems)	
Mixed species environmental planting	Prune (Selective, 33%) 2		Thin on 33% (removes 0% of stems)	
Mixed species environmental planting	Prune (Selective, 33%) 3		Thin on 33% (removes 0% of stems)	
Mixed species environmental planting	Prune (Selective, 33%) 4		Thin on 33% (removes 0% of stems)	
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Bark									UL DYL 6
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3.10.4 Adding a growth pause event

A growth pause event occurs when vegetation growth slows, stops or reverses due to a growth suppression event, such as material grazing by feral animals, weed infestation, disease, pests or similar, or a combination of factors. Where other events in this section are more specific to the actual event that has occurred, such as thinning, grazing by livestock or fire, they are to be modelled and not a growth pause event. To avoid any doubt, for the project carbon stocks and C10 simulations, a growth pause event must be added for any growth suppression events whether occurring before or after the implementation date.

A growth pause event must run for at least the period of time that the suppression factor(s) was maintained. For example, if a weed infestation slowed, stopped or reversed the vegetation growth over a period of six months, the corresponding growth pause event in FullCAM should cover at least the entire six month period. A growth pause event should also cover the time from when the vegetation was first affected by the suppression factor(s) to when it has recovered beyond its condition and mass prior to being affected. The duration(s) determined and modelled should be supported by the 'forest management information' that the proponent must collect and maintain as per section 5.5 of the Determination.

Simulation Type	Steps required
C100_5% Default baseline Historic baseline Hybrid baseline	Not permitted
<mark>C10</mark> Project carbon	 Add a new Forest treatment event. DO NOT select Insert Standard Values (Note: This differs from the directions for other events above).
	 a. Enter the calendar date of the start date of the disturbance event. This can be estimated if the actual date is not known. 4. Enter 'Growth Pause' as the event name (or a more specific name for the avent, or a "Grazing").
	 5. Check the <i>Type 1: Age Advance, 'On'</i> box under <i>Forest Treatment</i>. 6. In the <i>Age advance due to treatment</i> box enter how long the growth pause event should run for according to the above notes as a decimal proportion in years, and as a negative number. For example, if the growth pause event occurred for 3 years and 9 months, then '-3.75' would be entered in this box. As another example, if the growth pause event occurred for 5 years, then '-5' would be entered in this box.
	 In the Advancement period box enter the absolute (aka positive) value of the number added in the 'Age advance due to treatment' box. For example, using the examples above in step 6, the value to add to this box would be: '3.75', or '5'.
	 Following these steps has the effect of 'pausing' growth in carbon stocks for the duration of the growth pause event. DO NOT change any other values on this tab. Press 'OK'.

📳 Event							
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5 Type 2: Tree Y	dvancement period [yr	, 			
Type 2: Tree Y	ields				

3.10.5 Adding a grazing by livestock event

Where any grazing by livestock has occurred within a CEA, a grazing by livestock event must be added as per the instructions below. To avoid any doubt, for the project carbon stocks and C10 simulations, a grazing by livestock event must be added for applicable events whether occurring before or after the implementation date.

Notes on timing of a grazing by livestock event: Proponents must model the event as occurring on the date that the grazing by livestock in the CEA ceased. For grazing that is ongoing (has not ceased), proponents must model the event as occurring exactly one month before the end of the applicable reporting period. In subsequent reporting periods where the ongoing grazing has continued, proponents must delete the event modelled for the preceding reporting period, and add a new event for either the date that grazing ceased during the new reporting period, or again model it as occurring at one month before the end of the reporting period where the grazing remains ongoing.

Where more than one grazing by livestock event has commenced in the history of the CEA, the proponent is only required to model the latter of the multiple events as per the above requirements. The events modelled should be supported by the 'forest management information' that the proponent must collect and maintain as per section 5.5 of the Determination.

Simulation Type	Steps required
<mark>C100_5%</mark>	Not permitted
<mark>Default baseline</mark>	
Historic baseline	
Hybrid baseline	

Simulation Type	Steps required
<mark>C10</mark>	 Click the 'New' button to create a new event.
<mark>Project carbon</mark>	2. Insert the date of the event in the blank field beside the 'Timing'
	section. This will need to be entered in the format dd mmm yyyy.
	Refer to the notes on timing above to determine which date to enter.
	3. In the drop down menu next to 'Type', select 'Thin'.
	 Click 'Insert standard values'. Select the row with 'Event Name' of
	'Initial clearing: No product recovery' and then click 'OK' and 'No' to
	insert the name of the standard event.
	Edit the name of the event to 'Grazing by livestock'.
	6. In the box next to 'Affected portion – the percentage of forest
	affected by thin' change the number to '40'.
	7. In the 'Destination Percentages in the Affected Portion – Stems to:'
	boxes, change the value of 'Biofuel' to '100' and all other boxes to '0'.
	8. In the 'Destination Percentages in the Affected Portion – Branches to:'
	boxes, change the value of 'Biofuel' to '100' and all other boxes to '0'.
	9. In the 'Destination Percentages in the Affected Portion – Bark to:'
	boxes, change the value of 'Biofuel' to '100' and all other boxes to '0'.
	10. In the 'Destination Percentages in the Affected Portion – Leaves to:'
	boxes, change the value of Biofuel' to 100 and Leaf littler' to 0.
	11. In the Destination Percentages in the Affected Portion – Course roots
	to: boxes, change the value of Biofuel to 100 and Course dead
	10015 10 0.
	12. Ensure that the Replace removed trees with new trees (of age 0) box
	13 ULNEU.
	third screenshot below (see red boyes)
	14 Click (OK' to finish adding the event to the event queue
	14. Check OK to hinsh during the event to the event quede.

Event				
ime			Auto Nar	ne 🛛 OK
pe Thin	▼ Notes		Usage.	Cancel
Z Simulata Cal	andar data	14 Mar 2025 Dave	0 Add Dave	
			And Days	
hin				
a service and the	-			Insert Standard Values
Iffected Portion	1	Age Adjustment		
Percentage of	of forest affected by thin	🗌 Enable biomass based age adjust	ment	
estination Percentag	es in the Affected Portio	n	Post-Thin Period	
🔘 Log grades 🛛 🔘 🕅	Manual		Relative Allocation	Multipliers
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Biofuel Paper and pu Packing woo Fumiture Fiberboard	Biofuel Paper and d Packing w Furniture Fiberboard	Polp Paper rood Mill residue	1 Leaver 1 Coarse 1 Fine ro Length of Period	s roots ots
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Select A Standard Event			
Species 🛆	Event Name	Event Label	Event Description
Mixed species environmental planting	Initial clearing: no product recover	y	Thin (clearing)
Mixed species environmental planting	Initial clearing: product recovery		Thin (clearing)
Mixed species environmental planting	Prune (Selective, 33%)		Thin on 33% (removes 0% of stems)
Mixed species environmental planting	Prune (Selective, 33%) 2		Thin on 33% (removes 0% of stems)
Mixed species environmental planting	Prune (Selective, 33%) 3		Thin on 33% (removes 0% of stems)
Mixed species environmental planting	Prune (Selective, 33%) 4		Thin on 33% (removes 0% of stems)
/ <u> </u>			
			OK Cancel

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be Thin			lotes			Usage	Cancel
ming							
/ Simulate	e Calendar	date	▼ 30 Jul 2	2017	Days	0 Add Days	
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nin							Insert Standard Values
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Stems to: 0	Deadwood	Branches to	Deadwood	Bark to: 0	Bark litter	1 Stems 1 Branche	15
Stems to: 0 100	Deadwood Biofuel	Branches to 0 100	Deadwood Biofuel	Bark to: 0 100	Bark litter Biofuel	1 Stems 1 Branche 1 Bark	15
Stems to: 0 100 0	Deadwood Biofuel Paper and pulp	Branches to 0 100 0	p: Deadwood Biofuel Paper and pulp	Bark to: 0 100 0	Bark litter Biofuel Paper	1 Stems 1 Branche 1 Bark 1 Leaves	5
6tems to: 0 100 0 0	Deadwood Biofuel Paper and pulp Packing wood	Branches to 0 100 0 0	o: Deadwood Biofuel Paper and pulp Packing wood	Bark to: 0 100 0 0	Bark litter Biofuel Paper Mill residue	1 Stems 1 Branche 1 Bark 1 Leaves 1 Coarse r	oots
O 0 100 0 0 0 0 0 0 0	Deadwood Biofuel Paper and pulp Packing wood Fumiture	Branches to 0 100 0 0 0	Deadwood Biofuel Paper and pulp Packing wood Fumiture	Bark to: 0 100 0 0 100.0	Bark litter Biofuel Paper Mill residue	1 Stems 1 Branche 1 Bark 1 Leaves 1 Coarse r 1 Fine root	oots ts
Otems to: 0 100 0 0 0 0 0 0 0 0 0 0 0	Deadwood Biofuel Paper and pulp Packing wood Fumiture Fiberboard	Branches to 0 100 0 0 0 0	Deadwood Biofuel Paper and pulp Packing wood Fumiture Fiberboard	Bark to: 0 100 0 100.0 Leaves to:	Bark litter Biofuel Paper Mill residue	1 Stems 1 Branche 1 Bark 1 Leaves 1 Coarse r 1 Fine rool Length of Period	oots ts
Otems to: O 100 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Deadwood Biofuel Paper and pulp Packing wood Fumiture Fiberboard Construction	Branches to 0 100 0 0 0 0 0	Deadwood Biofuel Paper and pulp Packing wood Fumiture Fiberboard Construction	Bark to: 0 100 0 0 100.0 Leaves to: 0	Bark litter Biofuel Paper Mill residue Leaf litter	1 Stems 1 Branche 1 Bark 1 Leaves 1 Coarse r 1 Fine root Length of Period 0 Years [y	rs voats r]
O 0 100 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Deadwood Biofuel Paper and pulp Packing wood Fumiture Fiberboard Construction Mill residue	Branches to 0 100 0 0 0 0 0 0	Deadwood Biofuel Paper and pulp Packing wood Fumiture Fiberboard Construction Mill residue	Bark to: 0 100 0 0 100.0 Leaves to: 0 100	Bark litter Biofuel Paper Mill residue Leaf litter Biofuel	1 Stems 1 Branche 1 Bark 1 Leaves 1 Coarse r 1 Fine root Length of Period 0 0 Years [yr	is ioots ts r]
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O O 100 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Deadwood Biofuel Paper and pulp Packing wood Fumiture Fiberboard Construction Mill residue	Branches to 0 100 0 0 0 0 0 0 0 0 100.0 Fine dead ro Biofuel	Deadwood Biofuel Paper and pulp Packing wood Fumiture Fiberboard Construction Mill residue	Bark to: 0 100 0 100.0 Leaves to: 0 100 100.0 Coarse Roc 0	Bark litter Biofuel Paper Mill residue Leaf litter Biofuel	1 Stems 1 Branche 1 Branche 1 Bark 1 Leaves 1 Coarse r 1 Fine root 0 Years [n Tree Removal and Trees (stems) removed Average age of removed trees =	r] I Replacement d by this thin: 40.0% X Average age of tree
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3.10.6 Adding fire events

3.10.6.1 Adding a management fire event

These steps must be repeated for each management fire event that follows a clearing event that occurs in a CEA during the simulation period. A management fire event encourages grass for pasture. It is a fire that occurs within a clearing interval and is used to set back the regrowth, killing a substantial proportion of the above ground plant parts. For each of these events, the date must reflect the date of that event.

Simulation Type	Steps required
C100_5%	Not permitted
C10	Not permitted

Simulation Type	Steps required
Default baseline	1. Click on the 'New' button to create a new event.
Historic baseline	2. In the blank field besides the 'Timing' section, insert the date of the
Hybrid baseline	management fire in the simulation period. The intervals between
Project carbon	events must reflect those that occurred historically. For example, for
	default values used in baselines, this is 7 years after the regeneration
	event.
	3. In the drop down menu next to 'Type', select 'Forest fire'.
	4. Click 'Insert standard values'. Select the row with 'Event Name' of
	'Wildfire – trees killed' and then click 'OK' and 'Yes' to insert the name
	of the standard event.
	5. Change the name of the event to 'Management fire'.
	6. CHANGE THE SETTINGS TO MATCH THOSE IN THE SCREENSHOT
	BELOW.
	7. Tick the 'Enable biomass based age adjustments' box.
	8. Click 'OK' to finish adding the event to the event queue.

🚺 Event							×
Name						Auto Name	ОК
Type Forest fire	е	•	Notes			Usage	Cancel
Timing							ຸ
Simulate	Caler	ndar date	✓ 21 Dec 2016	Ī	Days 0	Add Days	•
Forest Fire						F	Instat Chandland Volume
Affected Po	rtion		Leaf Regrowth Perce	ntage		Age Adjustment	
	Percentage o	of forest	Percentag	e of leaves	that	Enable biomass	based age adjustment
	affected by fir	re	automatic	ally' regrow i	n year after fire		
Destination F	Percentage	s in the Affe	cted Portion				
Tree	To Atmos.	To Debris	Decomposable Debris	To Atmos.	To Inert Soil		
Stems			Deadwood				
Branches			Chopped wood				
Bark			Bark litter				
Leaves			Leaf litter				
Coarse roots			Coarse dead roots		-		
Fine roots			Fine dead roots				
			ResistantDebris	To Atmos.	To Inert Soil		
			Deadwood				
			Chopped wood				
			Bark litter	-			
			Leaf litter				
			Coarse dead roots	-			
			Fine dead roots				

Species /			Event Name		Event Label		Event	Description
lixed species	environment	tal planting	Prescribed burn		All regions		Forest	t fire on 100%
lixed species	environment	tal planting	Site prep: Broadcast Burn		All regions		Forest	t fire on 100%
lixed species	environment	tal planting	Site prep: Windrow and bu	um i	All regions		Forest	t fire on 100%
ixed species	environment	tal planting	Wildfire - trees killed		All regions		Forest	t fire (clearing)
ixed species	environmeni	tai pianting	Wildhire - trees not killed		Ail regions		Fores	thre on TUU %
						0	ок	Cancel
Event								(
me Managen	ment Fire	~				Auto Name		ОК
be Forest fire			Notes			Usage		Cancel
ming								
7 Simulate	Caler	ndar date	✓ 21 Dec 2016		Days 0	Add Days		
					39 TH			
orest Fire							Insert Standa	rd Values
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orest Fire Vifected Por	rtion Percentage o affected by fir	of forest re	Leaf Regrowth Percer 0 Percentage 'automatica	i tage e of leaves illy' regrow	that in year after fire	Age Adjustment	Insert Standar	rd Values
estination F	ntion Percentage o affected by fir Percentages To Atmos	of forest re s in the Affe To Debris	Leaf Regrowth Percer 0 Percentage 'automatica cted Portion Decomposable Debris	itage e of leaves illy' regrow i To Atmos	that in year after fire To linett Soil	Age Adjustment	Insert Standar	rd Values
estination F ree	rtion Percentage o affected by fir Percentage: To Atmos.	of forest re s in the Affe To Debris 30	Leaf Regrowth Percer 0 Percentage automatica cted Portion Decomposable Debris Deadwood	ntage of leaves ally'regrow i To Atmos. 75	that in year after fire To Inert Soil 0	Age Adjustment	Insert Standar	rd Values
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estination P Tree Stems Branches Bark Leaves	rtion Percentage of affected by fin Percentage: To Atmos. 0 0 15 20	of forest re s in the Affe 30 30 15 40	Leaf Regrowth Percer 0 Percentage automatica cted Portion Decomposable Debris Deadwood Chopped wood Bark litter Leaf litter	To Atmos. 75 0 65 65	that in year after fire To Inert Soil 0 0 0 0	Age Adjustment	Insert Standar	rd Values
estination P Tree Stems Branches Bark Leaves Coarse roots	rtion Percentage of affected by fir Percentage To Atmos. 0 0 15 20	of forest re s in the Affe 30 30 15 40 0	Leaf Regrowth Percer 0 Percentage automatica Automatica Automatica Percentage automatica Automatica Automatica Percentage automatica Automa	tage of leaves and leaves the Atmos. 75 0 65 65 0 0	that in year after fire To Inert Soil 0 0 0 0 0	Age Adjustment	Insert Standa	rd Values
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estination F Tree Stems Branches Bark Leaves Coarse roots Fine roots	rtion Percentage c affected by fir Percentage To Atmos. 0 0 15 20	of forest re s in the Affe To Debris 30 30 15 40 0 2	Leaf Regrowth Percer	tage e of leaves ally' regrow i 75 0 65 65 0 0 0 75 0 65 65 65 65 0 0	that in year after fire	Age Adjustment	Insert Standa	rd Values
Affected Por 100 Interview of the second s	rtion Percentage c affected by fir Percentage To Atmos. 0 0 15 20	of forest re s in the Affe To Debris 30 30 15 40 0 2	Leaf Regrowth Percer 0 Percentage automatica cted Portion Decomposable Debris Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Ene dead roots	tage e of leaves illy' regrow i 75 0 65 0 0 75 0 65 65 65 65 0 0 0	that in year after fire To Inert Soil 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Age Adjustment	Insert Standa	rd Values

3.10.6.2 Adding a windrow and burn fire event

These steps must be repeated for each windrow and burn fire event that follows a clearing event that occurs in a CEA. A windrow and burn fire event reduces the amount of debris that remains after the clearing event. For each of these events, the date MUST reflect the interval between events.

Simulation Type	Steps required
C100_5%	Not permitted
Project carbon	Not permitted

C10	1.	Click on the 'New' button to create a new event.
Default baseline	2.	Insert the date of the windrow and burn fire in the simulation period
Historic baseline		in the blank field beside the 'Timing' section.
Hybrid baseline	3.	In the drop down menu next to 'Type', select 'Forest fire'.
	4.	Click 'Insert standard values'. Select the row with 'Event Name' of 'Site
		prep: Windrow and burn' and then click 'OK' and 'Yes' to insert the
		name of the standard event.
	5.	Do NOT change any other setting.
	6.	Click 'OK' to finish adding the event to the event queue.

Name Type Forest fire Votes Vo	Event							
Type Forest fire Notes Usage Cano Timing Simulate Calendar date 30 May 2018 Days 0 Add Days Forest Fire Affected Portion Percentage of forest affected by fire Percentage of leaves that affected by fire Destination Percentages in the Affected Portion Tree To Atmos. To Debris Deadwood Banches Deadwood Bank iter Leaves Leaves Leaving Banches ResistantDebris Fine dead roots Fine d	Name						Auto Name	ОК
Timing Image: Simulate Calendar date 30 May 2018 Days 0 Add Days Forest Fire Affected Portion Leaf Regrowth Percentage Age Adjustment Percentage of forest affected by fire Percentage of leaves that automatically regrow in year after fire Age Adjustment Destination Percentages in the Affected Portion Tree To Atmos. To Debris Decomposable Debris To Atmos. To Inert Soll Stems Deadwood Deadwood Deadwood Deadwood Bark Deadwood Deadwood Deadwood Deadwood Deadwood Fine roots Fine dead roots Fine dead roots Fine dead roots Fine dead roots Bark liter Deadwood Deadwood Deadwood Deadwood Deadwood Coarse roots Fine dead roots	Type Forest	fire	•	Notes			Usage	Cancel
Simulate Calendar date 30 May 2018 Days 0 Add Days Forest Fire Affected Portion Leaf Regrowth Percentage Age Adjustment Age Adjustment Percentage of forest affected by fire Percentage of leaves that automatically regrow in year after fire Brable biomass based age adjustment Destination Percentages in the Affected Portion Percentage of costs Decomposable Debris To Atmos. To Inert Soil Stems Deadwood Deadwood Deadwood Deadwood Bark Deadwood Deadwood Deadwood Fine roots Fine dead roots Deadwood Deadwood Bark Itter Deadwood Deadwood Deadwood Deadwood Deadwood Deadwood Deadwood Deadwood Deadwood Deadwood Deadwood Deadwood Deadwood Deadwood Deadwood Deadwood Deadwood Deadwood Deadwood	Timing							e
Forest Fire Affected Portion Leaf Regrowth Percentage Age Adjustment Percentage of forest affected by fire Percentage of leaves that automatically regrow in year after fire Destination Percentages in the Affected Portion Tree To Atmos To Debris Decomposable Debris To Atmos To Inert Sol Branches Deadwood Deadwood Deadwood Deadwood Deadwood Bark Dead roots Fine dead roots Fine dead roots Fine dead roots Percentage diret To Atmos. To Inert Sol Deadwood Bark Deadwood Deadwood Deadwood Bark Enable biomass based age adjustment Enable biomass based age adjustment	Simulate	Cale	ndar date	✓ 30 May 2018		Days 0	Add Days	
Affected Portion Percentage of forest affected by fire Percentage of forest affected by fire Percentage of leaves that 'automatically' regrow in year after fire Percentages in the Affected Portion Tree To Atmos. To Debris Deadwood Chopped wood Bark Leaves Coarse roots Fine roots Fine dead roots Fine d	Forest Fi	re					C	and Grandend Velues
Percentage of forest affected by fire Percentage of leaves that 'automatically' regrow in year after fire Enable biomass based age adjustment Destination Percentages in the Affected Portion Decomposable Debris To Atmos. To Inert Soil Decomposable Debris To Atmos. To Inert Soil Stems Deadwood Deadwood Deadwood Branches Deadwood Deadwood Deadwood Bark Deadwood Deadwood Deadwood Fine roots Fine dead roots Deadwood Deadwood Fine dead roots Deadwood Deadwood Deadwood Deadwood Deadwood Deadwood Deadwood Deadwood Fine dead roots To Atmos. To Inert Soil Deadwood Deadwood Deadwood Leaf litter Deadwood Deadwood Deadwood Deadwood Deadwood Deadwood <td< td=""><td>Affected</td><td>Portion</td><td></td><td>Leaf Regrowth Percer</td><td>ntage</td><td></td><td>Age Adjustment</td><td>Isent Standard Values</td></td<>	Affected	Portion		Leaf Regrowth Percer	ntage		Age Adjustment	Isent Standard Values
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Destination Percentages in the Affected Portion Tree To Atmos. To Debris Decomposable Debris To Atmos. To Inert Soil Stems		affected by fi	ire	automatic	ally' regrow i	in year after fire		
Destination Percentages in the Affected Portion Tree To Atmos To Debris Decomposable Debris To Atmos. To Inert Soil Stems								
Tree To Atmos. To Debris Decomposable Debris To Atmos. To Inert Soil Stems	Destination	n Percentage	s in the Affec	ted Portion				
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Coarse dead roots				Leaflitter		-		
Fine dead roots				Coarse dead roots				
				Fine dead roots				

pecies /	Event Name	Event Label	Event Description
lixed species environmental planting	Prescribed burn	All regions	Forest fire on 100%
ixed species environmental planting	Site prep: Broadcast Burn	All regions	Forest fire on 100%
lixed species environmental planting	Site prep: Windrow and burn	All regions	Forest fire on 100%
ixed species environmental planting	Wildfire - trees killed	All regions	Forest fire (clearing)
ixed species environmental planting	Wildfire - trees not killed	All regions	Forest fire on 100%

0	146.4						[0.1- N	
Name Site prep	o: Windrow an	d bum					Auto Nam	
ype Forest fir	e	•	Notes				Usage	<u>Cancel</u>
Timing								
☑ Simulate	Caler	ndar date			Days	0	Add Days]
Forest Fire	13							
Affected Po	rtion		Loof Pagmuth Paroa	ana		80	a Adiustanan	insert Standard Values
	Deservations	1 fa			ala			
100	affected by fi	re forest	automatic	ally' regrow	tnat in year after fir	ne 📃	Enable bioma:	ss based age adjustment
			and a stranger					
Destination	Percentage	s in the Affec	ted Portion					
Tree	To Atmos.	To Debris	Decomposable Debris	To Atmos.	To Inert Soil			
		0	Developed	60	0			
Stems	0	U	Deadwood	00	U			
Stems Branches	0	0	Chopped wood	0	0			
Stems Branches Bark	0	0	Deadwood Chopped wood Bark litter	0 100	0			
Stems Branches Bark Leaves	0	0 0 0 0	Deadwood Chopped wood Bark litter Leaf litter	0 100 100	0			
Stems Branches Bark Leaves Coarse roots		0 0 0 0 0	Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots	0 100 100 10	0 0 0 0			
Stems Branches Bark Leaves Coarse roots Fine roots	0		Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots	0 100 100 10 0				
Stems Branches Bark Leaves Coarse roots Fine roots	0	0 0 0 0 0	Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris	0 100 100 10 0				
Stems Branches Bark Leaves Coarse roots Fine roots			Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris	0 100 100 10 0 To Atmos.	0 0 0 0 0 0 0 0 0			
Stems Branches Bark Leaves Coarse roots Fine roots		0 0 0 0 0	Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood	0 100 100 10 0 To Atmos. 60	0 0 0 0 0 0 0 0			
Stems Branches Bark Leaves Coarse roots Fine roots		0 0 0 0 0	Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood Chopped wood	0 100 100 10 0 To Atmos. 60 0 100	0 0 0 0 0 0 0 0 0 0			
Stems Branches Bark Leaves Coarse roots Fine roots			Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots ResistantDebris Deadwood Chopped wood Bark litter	0 0 100 100 10 0 0 To Atmos. 60 0 100	0 0 0 0 0 0 0 0 0 0 0 0 0 0			
Stems Branches Bark Leaves Coarse roots Fine roots			Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood Chopped wood Bark litter Leaf litter	0 0 100 100 10 0 To Atmos. 60 0 100 100 100 100	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			
Stems Branches Bark Leaves Coarse roots Fine roots			Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots	0 0 100 100 10 0 To Atmos. 60 0 100 100 100 100 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			

3.10.6.3 Adding a prescribed fire event – to reduce fire risk

These steps must be repeated for each prescribed fire event aimed at reducing fuel loads and hence fire risk, that occurs in a CEA during the simulation period. A prescribed fire is used to control the accumulation of the debris pool. For each of these events the date must reflect the date of that event.

Simulation Type	Steps required
C100_5%	Not permitted
C10	Not permitted
Default baseline	Not permitted
Historic baseline	Not permitted
Hybrid baseline	Not permitted
Project carbon	1. Click on the 'New' button to create a new event.
	2. Insert the date of the prescribed fire in the simulation period in the
	blank field beside the 'Timing' section.
	3. In the drop down menu next to 'Type', select 'Forest fire'.
	4. Click 'Insert standard values'. Select the row with 'Event Name' of
	'Prescribed burn' and then click 'OK' and 'Yes' to insert the name of
	the standard event.
	5. Tick the 'Enable biomass based age adjustments' box.
	6. Do NOT change any other setting.
	7. Click 'OK' to finish adding the event to the event queue.

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vpe Forest fire 👻	Notes		Usage	Cancel
iming				0
Simulate Calendar date		Days 0	Add Days	
orest Fire			(Inco	t Standard Values
Affected Portion	Last Remouth Percentane	۵	n Adiustment	It Standard Values
Presentana of format				
affected by fire	automatically' regrow i	n year after fire	Enable biomass based	age adjustment
Destination Percentages in the Affer	cted Portion			
Tree To Atmos To Debris	Decomposable Debris To Atmos	To Inert Soil		
Stems	Deadwood			
Branches	Chopped wood			3
Bark	Bark litter	71 		
Leaves	Leaf litter			
Cosme mote	Coame dead mote	2. <u></u> -		
Eine mete		-		
Fine loots	Fine dead roots			
	ResistantDebris To Atmos	To Inert Soil		
	Deadwood			
	Chapped wood			
	Park litter	-		
		-		
		· <u></u>		
	Fine dead roots			
	1980 March			
Select A Standard Event				<u></u>
Species /	Event Name	Event Labe	l.	Event Description
Mixed species environmental planting	Prescribed burn	All regions		Forest fire on 100%
Mixed species environmental planting	Site prep: Broadcast Bum	All regions		Forest fire on 100%
vixed species environmental planting	Wildfire trees killed	All regions		Forest fire on 100%
Mixed species environmental planting	Wildfire - trees not killed	All regions		Forest fire on 100%
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/ LVCIIL							-
Name Prescrib	bed burn					Auto Name	😮 ок
Type Forest fi	fire	•	Notes			Usage	Cancel
Timing							e
Simulate	Caler	ndar date	✓ 23 Nov 2016		Days 0	Add Days	
Forest Fire	е						Insert Standard Values
Affected Po	ortion		Leaf Regrowth Percent	tage		Age Adjustment	
100	Percentage o	of forest	7 Percentage	of leaves	that	Enable biomass	based age adjustment
	affected by fi	re	automatical	lly' regrow	in year after fire		
Destination	Percentage	s in the Affe	cted Portion				
Tree	To Atmos.	To Debris	Decomposable Debris	To Atmos.	To Inert Soil		
Stems	0	0	Deadwood	15	0		
Branches	0	0	Chopped wood	0	0		
Branches Bark	0	0	Chopped wood Bark litter	0 80	0		
Branches Bark Leaves	0 2 2	0 0 5	Chopped wood Bark litter Leaf litter	0 80 90	0 0 0		
Branches Bark Leaves Coarse roots	0 2 2	0 0 5 0	Chopped wood Bark litter Leaf litter Coarse dead roots	0 80 90 0	0 0 0 0		
Branches Bark Leaves Coarse roots	0 2 2	0 0 5 0 0	Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots	0 80 90 0 0	0 0 0 0 0		
Branches Bark Leaves Coarse roots Fine roots	0 2 2	0 0 5 0 0	Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots ResistantDebris	0 80 90 0 0	0 0 0 0 0 0		
Branches Bark Leaves Coarse root: Fine roots	0 2 2	0 0 5 0 0	Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood	0 80 90 0 0 0 0 0 0 70 Atmos.	0 0 0 0 0 0 To Inert Soil		
Branches Bark Leaves Coarse roots Fine roots	0 2 2 38	0 0 5 0 0	Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood Chopped wood	0 80 90 0 0 0 co Atmos. 15 0	0 0 0 0 0 0 To Inert Soil 0		
Branches Bark Leaves Coarse roots Fine roots	0 2 2	0 0 5 0 0	Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood Chopped wood Bark litter	0 80 90 0 0 50 Atmos. 15 0 80	0 0 0 0 0 0 To Inert Soli 0 0 0		
Branches Bark Leaves Coarse root: Fine roots	0 2 2	0 0 5 0	Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood Chopped wood Bark litter Leaf litter	0 80 90 0 0 0 0 5 0 4tmos. 15 0 80 90	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		
Branches Bark Leaves Coarse root: Fine roots	0 2 2	0 0 5 0	Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots	0 80 90 0 0 0 50 Atmos. 15 0 80 90 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		
Branches Bark Leaves Coarse root: Fine roots	0 2 2	0 0 5 0 0	Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots	0 80 90 0 0 0 0 50 Atmos. 15 0 80 90 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		

3.10.6.4 Adding a wildfire – trees not killed event

These steps must be repeated for each 'wildfire – trees not killed' event that occurs in a CEA during the simulation period. For each wildfire – trees not killed event the date must be the date on which the event occurred.

Simulation Type	St	eps required
C100_5%	٠	Not permitted
C10	•	Not permitted
Default baseline	•	Not permitted
Historic baseline	•	Not permitted
Hybrid baseline	•	Not permitted
Project carbon	1.	Click on the 'New' button to create a new event.
	2.	Insert the date of the wildfire where trees are not killed in the
		simulation period in the blank field beside the 'Timing' section.
	3.	In the drop down menu next to 'Type', select 'Forest fire'.
	4.	Click 'Insert standard values'. Select the row with 'Event Name' of
		'Wildfire – trees not killed' and then click 'OK' and 'Yes' to insert the
		name of the standard event.
	5.	Tick the 'Enable biomass based age adjustments' box.
	6.	Do NOT change any other setting.
	7.	Click 'OK' to finish adding the event to the event queue.

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ype Forest fire 🔹	Notes		Usage	Cancel
iming				0
Simulate Calendar date		Days 0	Add Days	
orest Fire				
Affected Portion	Leaf Reprovith Percentage	An	e Adjustment	
Percentage of forest affected by fire	Percentage of leaves 'automatically' regrow	that	Enable biomass based	age adjustment
Destination Percentages in the Affec	ted Portion			
Tree To Atmos. To Debris	Decomposable Debris To Atmos.	. To Inert Soil		
Stems	Deadwood			
Branches	Chopped wood			
Bark	Back litter			
Comment		- A		
Coarse roots	Coarse dead roots			
Fine roots	Fine dead roots			
	BesistantDebris			
	To Atmos.	To Inert Soil		
	Deadwood			
	Chopped wood			
	Bark litter			
	Leaf litter			
	Coarse dead roots			
	Fine dead roots	-		
			-	
Select A Standard Event				×
	Event Name	Event Label		Event Description
Mixed energies environmental planting	Prescribed hum	All regione		Forest fire on 100%
Mixed species environmental planting	Site prep: Broadcast Burn	All regions		Forest fire on 100%
Mixed species environmental planting	Site prep: Windrow and hum	All regions		Forest fire on 100%
Mixed species environmental planting	Wildfire - trees killed	All regions		Forest fire (clearing)
	and the second	and the second se		(E.)

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pe Forest fire	•	•	Notes				Usage.		
iming									
Simulate	Caler	ndar date	✓ 1 Aug 2017		Days	0	Add Days		
orest Fire								<u> </u>	o
Affected Por	tion		Leaf Regrowth Percer	ntage		,	vae Adiustme	Insert	Standard Valu
100	Percentage o	of forest	100 Percentag	e of leaves	that	T	7 Enable bioma	are hared a	ina adjustman
	affected by fi	re	automatica	ally' regrow i	in year after fi	ire		33 00300 0	ige dajostmen
estination P	ementane	e in the Affec	ted Portion						
estination P	Percentage: ToAtmos.	s in the Affec	ted Portion Decomposable Debris	To Atmos.	To Inert Soil				
Vestination F Tree Stems	ercentage: To Atmos. 5	to Debris	ted Portion Decomposable Debris Deadwood	To Atmos.	To Inert Soil				
Estination F Tree Stems Branches	To Atmos.	To Debris	ted Portion Decomposable Debris Deadwood Chopped wood	To Atmos.	To Inert Soil				
Pestination F Tree Stems Branches Bark	To Atmos. 5 10 5	s in the Affect To Debris 0 0 0	ted Portion Decomposable Debris Deadwood Chopped wood Bark litter	To Atmos. 25 0 100	To Inert Soil				
Pestination F Tree Stems Branches Bark Leaves	To Atmos. 5 10 5 80	s in the Affect To Debris 0 0 0 20	ted Portion Decomposable Debris Deadwood Chopped wood Bark litter Leaf litter	To Atmos. 25 0 100 100	To Inert Soil				
Internation F Tree Stems Branches Bark Leaves Coarse roots	To Atmos. 5 10 5 80	s in the Affect To Debris 0 0 0 20 5	ted Portion Decomposable Debris Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots	To Atmos. 25 0 100 100 20	To Inert Soil				
Stems Branches Bark Leaves Coarse roots Fine roots	To Atmos. 5 10 5 80	s in the Affect To Debris 0 0 0 20 5 0	ted Portion Decomposable Debris Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots	To Atmos. 25 0 100 100 20 0	To Inert Soil 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				
Internation F Tree Stems Branches Bark Leaves Coarse roots Fine roots	Percentage: To Atmos. 5 10 5 80	s in the Affect To Debris 0 0 0 20 5 0 0	ted Portion Decomposable Debris Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris	To Atmos. 25 0 100 100 20 0	To Inert Soil				
estination F Tree Stems Branches Bark Leaves Coarse roots Fine roots	Percentage: To Atmos. 5 10 5 80	s in the Affect To Debris 0 0 0 20 5 0	ted Portion Decomposable Debris Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood	To Atmos. 25 0 100 20 0 To Atmos. 25	To Inert Soil				
estination F Tree Stems Branches Bark Leaves Coarse roots Fine roots	To Atmos. 5 10 5 80	s in the Affect To Debris 0 0 0 20 5 0	ted Portion Decomposable Debris Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood Chonned wood	To Atmos. 25 0 100 20 0 To Atmos. 25 0	To Inert Soil 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				
estination F Tree Stems Branches Bark Leaves Coarse roots Fine roots	Vercentage: To Atmos. 5 10 5 80	s in the Affect To Debris 0 0 0 20 5 0 0	ted Portion Decomposable Debris Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood Chopped wood Bark litter	To Atmos. 25 0 100 20 0 To Atmos. 25 0 100	To Inert Soil 0 0 0 0 0 To Inert Soil 0 0 0 0 0 0 0 0 0 0 0 0 0				
estination F Tree Stems Branches Bark Leaves Coarse roots Fine roots	Vercentage: 5 10 5 80	s in the Affec To Debris 0 0 0 20 5 0	ted Portion Decomposable Debris Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood Chopped wood Bark litter Leaf litter Leaf litter	To Atmos. 25 0 100 20 0 To Atmos. 25 0 100 100 100	To Inert Soil 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				
estination F Tree Stems Branches Bark Leaves Coarse roots Fine roots	Vercentage:	s in the Affec To Debris 0 0 0 20 5 0 0	ted Portion Decomposable Debris Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots	To Atmos. 25 0 100 20 0 To Atmos. 25 0 100 100 20 0 25 0 100 25 0 100 25 0 100 20 0 20 0 20 0 0 20 0 0 20 0 0 20 0 0 20 0 0 20 0 0 0 20 0 0 0 20 0 0 20 0 0 0 20 0 0 0 20 0 0 20 0 0 0 20 0 0 20 0 0 0 20 0 0 20 0 0 20 0 0 20 0 0 20 0 0 20 0 0 20 0 0 20 0 0 0 20 0 0 0 25 0 0 0 25 0 0 25 0 0 0 0 0 0 25 0 0 0 0 0 0 0 0 0 0 0 0 0	To Inert Soil 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0				

3.10.6.5 Adding a wildfire – trees killed event

These steps must be repeated for each wildfire – trees killed event that occurs during the simulation period and for each wildfire – trees killed event the date must be the date on which the event occurred.

Simulation Type	Steps required
C100_5%	Not permitted
C10	Not permitted
Default baseline	Not permitted
Historic baseline	Not permitted
Hybrid baseline	Not permitted
Project carbon	1. Click the 'New' button to create a new event.
	 Insert the date that the wildfire – trees killed event in the blank field beside the 'Timing' section. This will need to be entered in the format dd mmm yyyy.
	3. In the drop down menu next to 'Type', select 'Forest Fire'.
	 Click 'Insert standard values'. Select the row with 'Event Name' of 'Wildfire – trees killed' and then click 'OK' and 'Yes' to insert the name of the standard event.
	5. Click 'OK'.
	6. Do NOT change any other settings.
	7. Click 'OK' to finish adding the event to the event queue.

ime							Auto Name	🧐 ок
vpe Forest fire		•	Notes					Cancel
iming								0
Simulate	Caler	ndar date	•	25 Feb 2016		Days 0	Add Days	
orest Fire								0
Affected Portion			Leaf R	earowth Perce	ntage		Ane Adjustment	Standard Values
Perc	entage o	fforest	-	Percentag	e of leaves	that	Testis Konse based	
affec	ted by fir	e		'automatic	ally' regrow	in year after fire		age adjustment
Destination Perc	entages	s in the Affe	cted Porti	on				-
Tree To	Atmos	To Debris	Deco	mposable Debris	To Atmos	To Inert Soil		
Stems	Autios.	TO Deblia	D	eadwood	TO Autos.	TO INCLUSION		
Branches			C	hopped wood				
Bark			B	ark litter		-		
Leaves	-		Le	eaf litter				
Coarse roots			C	oarse dead roots				
Fine roots			Fi	ne dead roots				
			Resis	stantDebris	To Atmos	To Inert Soil		
			D	eadwood		1 <u>0,0000,000</u>		
			C	hopped wood				
			B	ark litter				
			Le	e <mark>af litte</mark> r				
			C	oarse dead roots				
			Fi	ne dead roots				
Select A Stand	lard Eve	ent						— ×-
Species /			Event N	ame		Event Lat	bel	Event Description
Mixed species env	ironment	tal planting	Prescrib	ed burn		All regions	3	Forest fire on 100%

Species /	Event Name	Event Label	Event Description
lixed species environmental planting	Prescribed burn	All regions	Forest fire on 100%
Aixed species environmental planting	Site prep: Broadcast Burn	All regions	Forest fire on 100%
Mixed species environmental planting	Site prep: Windrow and burn	All regions	Forest fire on 100%
Mixed species environmental planting	Wildfire - trees killed	All regions	Forest fire (clearing)
Mixed species environmental planting	Wildfire - trees not killed	All regions	Forest fire on 100%

ne Wildtire	- trees killed						Auto Name	0
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orest Fire							(Insert Standard Values
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100	Percentage o	of forest	0 Percentag	e of leaves	that	🗐 Ena	ole biomass b	ased age adjustment
	affected by fi	ne	automatic	ally' regrow	in year after fire			
estination	Percentage	s in the Affe	cted Portion					
Tree	To Atmos.	To Debris	Decomposable Debris	To Atmos.	To Inert Soil			
Stems	10	90	Deadwood	25	0			
Stems Branches	10 20	90 80	Deadwood Chopped wood	25 0	0			
Stems Branches Bark	10 20 10	90 80 90	Deadwood Chopped wood Bark litter	25 0 100	0 0 0			
Stems Branches Bark Leaves	10 20 10 80	90 80 90 20	Deadwood Chopped wood Bark litter Leaf litter	25 0 100 100	0 0 0 0			
Stems Branches Bark Leaves Coarse roots	10 20 10 80	90 80 90 20 100	Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots	25 0 100 100 20				
Stems Branches Bark Leaves Coarse roots Fine roots	10 20 10 80	90 80 90 20 100 100	Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots	25 0 100 100 20 0	0 0 0 0 0 0			
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Stems Branches Bark Leaves Coarse roots Fine roots	10 20 10 80	90 80 90 20 100 100	Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood	25 0 100 20 0 To Atmos. 25	0 0 0 0 0 0 To Inert Soil 0			
Stems Branches Bark Leaves Coarse roots Fine roots	10 20 10 80	90 80 90 20 100 100	Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood Chopped wood	25 0 100 20 0 To Atmos. 25 0	0 0 0 0 0 0 0 0 0 0			
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3.10.7 Creating and cloning regimes

For default, historic and hybrid baselines, the entire events queue that includes all simulated events for the entire baseline management event scenario (see section 4.12 of the Determination) must be cloned to cover the 100 year baseline forecast period.

Simulation Type	Steps required
Default baseline	• Follow the above steps to create a plot and the events forming a single clearing interval of 15 years (regeneration, management fire where applicable and clearing). By default, FullCAM will create a new regime for each event added.
	 Highlight each of the existing regimes in the left hand column by holding ctrl on the keyboard and clicking on each regime. Select the 'Edit' button under the Begime Editing header
	 In the name field type 'baseline', then click 'ok'. This will combine all existing events under one regime.
	Press the 'Clone' button under the Regime Editing header.
	 Enter '15' for calendar years and '6' for 'number of times', a value high enough to clone events over the entirety of the 100-plus year baseline period and click 'ok'.
	 Any events that are highlighted grey towards the bottom of the events queue fall beyond the 100-plus year modelling period and will not be simulated. These can be left in the event queue as they will not affect
	the simulation.
	 The last 'initial clearing: no product recovery' event will fall beyond the 100 year baseline period and will need to be deleted (will appear)
	<mark>highlighted in grey).</mark>

	 Click on it to select it, and then press the 'Delete' button under the
	Event Editing header and click 'yes'.
Historic baseline	 Follow the above steps to create a plot and the events forming the two clearing intervals of the durations supported by historical evidence. Highlight each of the existing regimes in the left hand column by holding ctrl on the keyboard and clicking on each regime.
	 Select the 'Edit' button under the Regime Editing header.
	• In the name field type 'baseline', then click 'ok'. This will combine all
	existing events under one regime.
	• Calculate the number of years between the first event of the first interval and the last event of the second interval. Add 1 to this number. I.e. years between initial regeneration event modelled and the last clearing event modelled plus 1.
	 Press the 'Clone' button under the Regime Editing header.
	 Enter the number calculated above for 'calendar years' and '10' for 'number of times' (or at least enough to clone events over a 100 years), a value high enough to clone events over the entirety of the 100-plus year baseling paried and click (clic)
	year baseline period and click 'ok'.
	• Any the events that are highlighted grey towards the bottom of the events queue fall beyond the 100-plus year modelling period and will not be simulated. These can be left in the event queue as they will not affect the simulation.
Hybrid baseline	• Follow the above steps to create a plot and the events forming the first clearing interval of 15 years, and the second clearing interval of the duration supported by historical evidence. By default, FullCAM will create a new regime for each event added.
	Highlight each of the existing regimes in the left hand column by holding strl on the keyboard and slicking on each regime
	 Soloct the 'Edit' button under the Bogime Editing header
	 In the name field type (baseline' then click (ok'. This will combine all
	existing events under one regime.
	 Calculate the number of years between the first event of the first interval and the last event of the second interval. Add 1 to this number. le. years between initial regeneration event modelled and last clearing event plus 1.
	 Press the 'Clone' button under the Regime Editing header.
	• Enter the number calculated above for 'calendar years' and <mark>'10' for</mark>
	'number of times' (or at least enough to clone events over a 100 years) , a value high enough to clone events over the entirety of the 100-plus
	 Any The events that are highlighted grey towards the bottom of the events queue fall beyond the 100-plus year modelling period and will
	not be simulated. These can be left in the event queue as they will not affect the simulation
C10	Not applicable
C100_5%	
Project carbon	



Name Baseline			OK	
			Calice	
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plorer Log					
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~ 12 montes an 2045 Baseline		5 Jan 2030 5 Jan 2037 5 Jan 2044	Plant trees: Mixe Management Fi Initial clearing: r	ed species environmental plant re no product recovery	ling
~ 12 months an 2060 Baseline		5 Jan 2045 5 Jan 2052 5 Jan 2059	Plant trees: Mixe Management Fi Initial clearing: r	ed species environmental plant re 10 product recovery	ling
~ 12 months an 2075		5 Jan 2060 5 Jan 2067 5 Jan 2074	Plant trees: Mixe Management Fi Initial clearing: r	ed species environmental plant re 10 product recovery	ting
~ 12 months an 2090		5 Jan 2075 5 Jan 2082 5 Jan 2089	Plant trees: Mixe Management Fi Initial clearing: r	ed species environmental plant re 10 product recovery	ling
Baseline		5 Jan 2090 5 Jan 2097 5 Jan 2104	Plant trees: Mixe Management Fi Initial clearing: r	ed species environmental plant re 10 product recovery	ting
an 2100 Baseline		5 Jan 2105 5 Jan 2112 5 Jan 2119	Plant trees: Mixe Management Fi Initial clearing: r	ed species environmental plant re no product recovery	ting

3.11 The Output Tab

Simulation	Steps required
Туре	
C100_5% C10	 Double click on 'Output1' listed in the Output Window. Click on the icon at the top of the output window:
Default baseline Historic	() FullCAM_testing_Sep2016_NFMR1.plo - Output 1 [2] (1) 23 1 → 1 = ■ [2] 123 1 → 1 = \square [2] 133 1 →
baseline Hybrid baseline Project carbon	 Selected outputs have a tick next to their entry, and on the folder(s) where they are located. Unselect all items so that the text reads '0 outputs selected'.
C100_5% C10	 Select the tree carbon pools: Carbon / Forest / Plants / C mass of trees. Click 'OK'.
Default baseline Hybrid baseline Historic baseline	 Select the tree carbon pools: Carbon / Forest / Plants / C mass of trees. Select the debris carbon pools: Carbon / Forest / Plants / C mass of debris. Click 'OK'.
Project carbon	 Select the tree carbon pools: Carbon / Forest / Plants / C mass of trees. Select the debris carbon pools: Carbon / Forest / Debris / C mass of forest debris. Select the CH₄ emissions from fire: Carbon / Whole / Emissions / CH4 emitted due to fire. Select the N₂O emissions from fire: Nitrogen / Whole / Emissions / N2O emitted due to fire. Click 'OK'.

() Select Outputs		×
Carbon Carbon Nitrogen Other		
0 outputs selected, from the 1/9 available	Cancel	



3.12 Running Simulations

To run the simulation, press the icon in the top menu bar:

3.13 Viewing outputs

<u>Outputs</u> can be viewed by clicking the icon (circled) at the top of the Output window as either:

1. Graph

FullCAM_testing_Sep2016_NFMR1.plo - Output 1
 □ □ ■

2. Tabular form

3.14 Transferring outputs into a spreadsheet

To transfer data into a Microsoft Excel or equivalent spreadsheet for analysis:

Copy all the output data by clicking on the icon (circled) in the top of the Output window.

FullCAM_testing_Sep2016_NFMR1.plo - Output 1	
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Open Microsoft Excel (or equivalent spreadsheet software), and 'Paste' the data copied from FullCAM into the spreadsheet. For example:

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	of the Determination, calculated in accordance with section 4.9 of the Determination.									
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Default baseline Historic baseline Hybrid baseline	• Refer to Division 4.4 of the Determination for calculating baselines, specifically Equation 4 at section 4.24. Section 5 of these Guidelines details how each FullCAM output in the spreadsheet data corresponds to the equation parameters									
Project carbon	 Refer to Division 4.4 of the Determination for calculating end of reporting period Project carbon stocks, specifically Equation 2 at section 4.22. Section 5 of these Guidelines details how each FullCAM output in the spreadsheet data corresponds to the equation parameters. 									

4. FullCAM simulations and offsets reporting

Project proponents must calculate the project net abatement by completing the equations in sections 4.21 to 4.29 of the Determination. Parameters generated in FullCAM are used in Equations in the Determination.

Note that for some of the equations the average of the FullCAM output over the simulation period will be required, whereas for others the value of the FullCAM output at the end of the simulation period will be used. Refer to the equations within the Determination to determine which value to use. Averages can be calculated using the average function within your spreadsheet software.

FullCAM Output	Parameter as defined	Scenario	Equation in the
	in the Determination		determination
C mass of debris	CD _{CEA,i}	Project	3
	BCD _{CEA,i,k}	Baseline	4
C mass of trees	CT _{CEA,i}	Project	3
	BCT _{CEA,i,k}	Baseline	4
CH ₄ emitted from	Е _{СН4} ,i	Project	7
debris due to fire			
N ₂ O emitted due to fire	E _{N2} O,i	Project	8

Table 7: FullCAM outputs and Corresponding Parameters as defined in the Determination

FOI 190318 Document 10a

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Australian Government

Department of the Environment and Energy

FullCAM Guidelines

Requirements for using the Full Carbon Accounting Model (FullCAM) in the Emissions Reduction Fund (ERF) methodology determination:

Carbon Credits (Carbon Farming Initiative) (Native Forest from Managed Regrowth) Methodology Determination 2013

Version 2.10

(published and in force from <u>xx1622</u> Dec 20172016)

Disclaimer

This document has been developed to assist project proponents to calculate abatement in FullCAM as required by the *Carbon Credits (Carbon Farming Initiative) (Native Forest from Managed Regrowth) Methodology Determination 2013.* This document is incorporated by reference in sections 1.3, 4.8, 4.9, 4.12, 4.14, 4.16, 4.18, 4.19, 4.30 and 5.3 of that determination. Project proponents should not use this document as a substitute for complying with the requirements in the Methodology Determination.

Before relying on any material contained in this document, project proponents should familiarise themselves with the requirements of the following legal documents: <u>Carbon Credits (Carbon Farming Initiative) (Native Forest from Managed Regrowth) Methodology Determination 2013</u>, <u>Carbon Credits (Carbon Farming Initiative)</u> <u>Act 2011</u>, <u>Carbon Credits (Carbon Farming Initiative)</u> <u>Regulations 2011</u>. Project proponents are also advises to obtain professional advice suitable to their particular circumstances.

This document does not displace relevant legislative provisions or other laws. All users are encouraged to read this document in conjunction with the relevant legislation, including the methodology determinations, referenced throughout this document. Where any inconsistencies are apparent, please be aware that the legislative provisions will take precedence.

This document will be updated periodically and users should note that some inputs and values may change over time. It is the user's responsibility to ensure that they are using the version of this document and any tool/s required in association as in force at the applicable offsets report submission date (consistent with the definitions in section 1.3 of the Methodology Determination).

The Department of the Environment and Energy and the Commonwealth of Australia will not be liable for any direct, indirect or consequential loss arising out of, or in connection with, or reliance on, information on, or produced by, using this document.

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1. Introduction

1.1 Use of FullCAM with the Native Forest from Managed Regrowth Methodology Determination 2013

The calculation of carbon abatement under the <u>Carbon Credits (Carbon Farming Initiative) (Native</u> <u>Forest from Managed Regrowth) Methodology Determination 2013</u> (the Determination) is dependent upon the use of the Full Carbon Accounting Model (FullCAM) consistently with the requirements of this document. In particular, sections 4.8, 4.9, 4.12, 4.14, 4.16, 4.18 and 4.19 of the Determination require that the materiality test, baseline scenario and project scenario for each carbon estimation area (<u>CEA</u>) must be modelled in FullCAM in accordance with the requirements in both the Determination and this document.

Section 4.18 of the Determination requires that any project specific inputs specified in this document must be used to determine the project carbon stocks for a CEA. Note that each of the simulations and modelling events detailed in this document have specific inputs that must be used. Section 4.19 also specifies that the relevant events that reflect actual management events and the relevant species setting specified in the document must be used to model the project period.

Sections 4.30 and 4.31 of the Determination also requireSection 4.30 and 4.31 of the Determination also requires key input and output data to be produced using FullCAM in accordance with the requirements in the Determination and this document. Where content of this document relates to provisions of the Determination, references are given to the location of those provisions.

Project proponents must only change FullCAM default settings as indicated in this document, and all other settings must not be changed. This is to ensure that defaults will apply where relevant <u>(see subsections 4.14(3) and 4.18(3) of the Determination</u>).

The latest version of FullCAM is available for download from <u>www.environment.gov.au/climate-change/greenhouse-gas-measurement/land-sector</u>. You should check the Determination to determine which version of FullCAM you are required to use for your applicable offsets report. If you determine that you must use a version of FullCAM that is unavailable on the website, please contact the Department at <u>erfforests@environment.gov.au</u> to obtain a copy.

1.2 Format of this document

This document provides:

- an overview of FullCAM relevant to the Determination;
- an overview of the simulations you must run in FullCAM as per the Determination;
- a step-by-step walkthrough of using FullCAM to run the simulations correctly; and
- an overview of the FullCAM outputs as they relate to equations within the Determination.

Section 1 of this document provides an overview of FullCAM, its features relevant to users and important requirements for using this document. Section 2 outlines the process used to determine which type of baseline proponents must use in accord with the Determination. Section 3 provides a step-by-step walkthrough of how to run FullCAM 'simulations' for the materiality test, baselines, and project reporting.

Section 2 includes tables summarising the simulations that users may be required to run in FullCAM. These tables summarise the objective, time period and outputs for each simulation, as well as the project activities that may need to be simulated. Where settings differ between different simulation types for the step-by-step process, section 3 outlines the separate parameters required. Users should familiarise themselves with the simulations in section 2 before following the steps in section 3 to run the simulations. Section 4 provides an overview of the FullCAM outputs needed to complete the equations within the Determination.

1.3 FullCAM background

FullCAM is used in Australia's National Greenhouse Gas Accounts for the land sector. FullCAM provides fully integrated estimates of carbon pools in forest and agricultural systems for Australia's land sector reporting. In addition, it accounts for human-induced changes in emission and sequestration of major greenhouse gases. FullCAM was developed under the National Carbon Accounting System (NCAS) at the then Australian Greenhouse Office to provide a dynamic account of the changing stocks of carbon in Australia's land systems since 1970 by integrating data on land cover change, land use and management, climate, plant productivity, and soil carbon over time. FullCAM estimates carbon stock change and greenhouse gas emissions at fine spatial and temporal scales, and uses a wide range of spatially referenced data.

Users of FullCAM can determine estimates of carbon stock change and greenhouse gas emissions for ERF projects on a similar basis to that used for land use and land use change in Australia's National Greenhouse Gas Inventory.

1.4 FullCAM plots and running simulations

FullCAM can run simulations on a 'plot'. A plot, for modelling purposes, is defined as a piece of land for which the event history, when modelled in FullCAM, is the same across that area of land. Separate plot files are created for each CEA.

In FullCAM, there are several types of plots that can be selected. Only 'forest system' is relevant to this Determination. This document provides overviews of the simulations that users may be required in Section 2, and the steps to run these simulations in Section 3.

FullCAM models using a single 'model point' location. Proponents do not need to define plot boundaries within FullCAM, rather proponents must input the coordinates for a single location within the plot boundaries that is at the approximate centre of the plot (the model point – see paragraph 3.3(1)(c) of the Determination). The latest spatial data for a plot must be downloaded using the 'Data Builder' tab each time the software is run. This process is described in section 3.5 of this document.

Separate plot files must be created for each carbon estimation area (CEA) (see section 3.3 of the Determination). In order to ensure all settings are correct, including defaults, we recommend creating new plot files each time a new version of FullCAM or these Guidelines is used. Plot files created under previous versions may contain different settings that will affect outputs and users are responsible for any inconsistencies.

For each CEA, separate plot files must be created for:

- determining whether a zero baseline or non-zero baseline must be used (initial reporting period only);
- estimating carbon stocks under a non-zero baseline (if a zero baseline is not appropriate); which
 may be either a 'default' baseline, an 'historic' baseline or an 'hybrid' baseline;
- estimating carbon stocks for the current reporting period; and
- determining if a disturbance event must be reported prior to the next reporting period.

1.5 Overview of the FullCAM interface

The FullCAM software user interface displays menus and a series of tabs. Each tab has a suite of fields in which information may either be required to complete as instructed in section 3 or left unchanged. The program is designed so that certain tabs in a plot file are made available only if required fields have valid information entered in earlier tabs. If the text of a tab or field is red, then FullCAM requires information in that tab or field before a simulation can be run. When all the required fields within a tab have valid information entered, the tab text will become blue. Help is provided within FullCAM by clicking on the or symbol available in most windows. A general overview of each tab follows.

There are only three tabs users see when they create a new FullCAM plot:

Tab	Explanation	
About	Includes a free text field where users can enter information about the plot file that	
	they have created. This is a good space to keep track of changes that have been	
	made or editing of event parameters.	
Configuration	Users select the system (e.g. forest, agricultural) they want to simulate in the plot.	
Timing	Enter the timing for starting and ending the simulation and the time steps required	
	for output data.	

Once fields in the above three tabs are populated users can access the following additional tabs:

Tab	Explanation
Data	In this tab users enter the latitude and longitude of the 'Model Point Location'
Builder	where they wish to simulate a plot file. Internet access is required to complete this
	tab. By choosing to 'Download Spatial Data' the associated soil and climate data for
	that latitude and longitude are automatically loaded into relevant parts of the
	remaining tabs. In the tab users can then download tree and/or crop species
	information and management regimes as appropriate. This information is also
	automatically loaded into relevant parts of the remaining tabs.
Site	Specific parameters (e.g. water [rainfall], temperature, productivity) are described.
Trees	Description of the properties of the tree species.
Crops	Description of the properties of crop or pasture species (only displays if agricultural
	system selected).
Soil	Description of soil properties.
Initial	In this tab the values for carbon at the start of the simulation are described. Values
Conditions	will automatically be populated by Data Builder using data downloaded from the
	FullCAM server.
Events	All of the events for the entire simulation period are listed in this tab. Users can add
	or remove events. Care must be taken not to violate requirements for modelling
	'management events' within the Determination. The names on the event list are

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	colour-coded to indicate whether they are ready, whether they are simulating or not, and what system they affect. The colour codes are:
	Red: Event not ready (renders event queue not ready);
	Grey: Event non-simulating (outside simulation period, will not affect simulation);
	<u>Green:</u> Forest;
	Yellow: Agricultural; and
	Brown: Mixed.
	Finally, the events users select with the cursor are coloured in the usual highlight
	colour.
Output	Defines what outputs are presented in output windows.
Window	
Explorer	Display of the parameter settings for each tab.
Log	This tab records changes made to the file to assist with analysis and error tracking.

•

<u>1.6</u> Development and updates to this document

This document has been developed by the Department to give effect to the Determination and assist the Determination to continue to be effective and meet the offsets integrity standards in section 133 of the *Carbon Credits (Carbon Farmina Initiative) Act 2011.* One of the most relevant offsets integrity standards for the Determination and this document to meet is that 'to the extent to which a method specified in, or ascertained in accordance with, a methodology determination in accordance with paragraph 106(1)(c) involves an estimate, projection or assumption—the estimate, projection or assumption should be conservative'. The use of estimates, projections or assumptions is inherent to the calculation method of the Determination which uses a computer model (FullCAM) to estimate levels of carbon in both baseline and project scenarios.

The input of events and parameters into the FullCAM software is structured to help ensure that the method ultimately results in a conservative estimate of the net abatement amount. The need for conservativeness can have a different impact on how assumptions are used for baseline scenarios and project scenarios. For example, for a baseline scenario to be 'conservative', assumptions are needed which avoid underestimating the amount of carbon in an area of land. Conversely, in a project scenario, assumptions are needed which avoid overestimating the amount of carbon in an area of land.

Another important offsets integrity standard is that the method results in 'eligible carbon abatement from the project' such that it contributes to meeting Australia's international emissions reduction obligations and complies with internationally accepted accounting rules. The development of both the FullCAM software and this document is mindful of the role of the Determination in meeting this offsets integrity standard and remaining consistent with international accounting rules. In particular, it is important that carbon abatement from each method is reflected in Australia's National Inventory Report.

The Emissions Reduction Assurance Committee plays an important role in assessing, reviewing and monitoring methodology determinations for compliance with the offsets integrity standards. In particular, if the Committee considers that there is reasonable evidence that a Determination (with

its incorporated models and documents) does not comply with one or more offsets integrity standards, the Committee can make a legislative instrument suspending the processing of applications to apply the method. The Department takes into account the views of the Committee on the need to update this document over time and how best to achieve the offsets integrity standards. Where possible, the Department also considers the views of project proponents to ensure that the requirements in this document are practical to use and fair.

2. Simulations overview

Sections 4.8, 4.9, 4.12, 4.14, 4.18 and 4.19 of the Determination require that the materiality test, baseline scenario and project scenario for each carbon estimation area <u>(CEA)</u> must be modelled in FullCAM in accordance with the requirements in both the Determination and this document.

2.1 Baseline scenarios

The baseline for each CEA will be either of two categories depending on the materiality test below (Section 2.2) – a zero baseline or a non-zero baseline.

Within the non-zero baseline category there are three possible baselines depending on the extent of historical information available regarding the clearing history – default, hybrid or historic. The decision flowchart below gives an overview of the process for determining which baseline to use.

Figure 1: Decision tree for determining the type of baseline to be used for each Carbon Estimation Area (CEA). See section 4.12 of the Determination for the relevant provisions.





2.2 Baseline materiality test

To determine whether a zero baseline may apply in a CEA, project proponents must complete the materiality test explained by this section and to be undertaken by following Section 3 of this document. Proponents must also comply with the provisions given for the materiality test in sections 4.7-4.9 of the Determination.

Completing the materiality test involves calculating two factors:

Factor	Explanation	Process for Calculating
C100_5%	5 per cent of the 'carbon mass of trees' at 100	see (a) below for how to calculate
	years after the implementation date	
C10	the maximum 'carbon mass of trees' over the ten	see (b) below for how to calculate
	years prior to the implementation date	

Note: 'Implementation date' is defined in section 1.3 of the Determination. It is the date when the project mechanism (a change in land management enabling native vegetation to achieve forest cover) was implemented in a CEA. Each CEA may have a different implementation date.

The values calculated for these factors will allow you to determine which baseline to use:

Result	Baseline to use
C10 is less than or equal to C100_5%	Zero baseline
C10 is greater than C100_5%	Non-zero baseline (default, hybrid or historic)

Overview of simulation for calculating C100_5%

Table 1: Overview of simulation for calculating C100_5%

Objective	Calculate 5 per cent of the 'C mass of trees' at 100 years after the
Simulation	From the implementation date to 100 years after the implementation date.
period	
Events permitted	Regeneration
Outputs	Monthly totals for 'C mass of trees' (FullCAM Output = Carbon / Forest / Plants
	/ C mass of trees)

Overview of simulation for calculating C10

Note: When calculating C10, project proponents must have documentary evidence for each event that is entered into the FullCAM event queue.

Table 2: Overview of simulation for calculating C10

Objective	Calculate the maximum carbon mass of trees reached duringover the 10 years
-	before the implementation date.
Simulation	From the day after the last comprehensive clearing before the 10 year period
period	that ends on the implementation date to the implementation date.
-	
Events permitted	Regeneration
	Clearing
	Thinning
	Management fire Fire
	Windrow and <u>burn</u> Burn
Outputs	Monthly totals for 'C mass of trees' (FullCAM Output = Carbon / Forest / Plants
	/ C mass of trees)

Note: 'comprehensive clearing' is defined in section 1.3 of the Determination. It means the destruction of trees or saplings, or both, by mechanical or chemical means that may be accompanied by use of fire, leaving the land in a non-forested state for pastoral land use.

2.3 Non-zero baselines

Non-zero baselines must be calculated if, according to the materiality test under the previous section, the maximum carbon stock during the ten years prior to the implementation date has reached a material level (i.e. $C10 > C100_{-5\%}$).

Overview of simulation for calculating a Default Baseline

A default non-zero baseline is suitable for project proponents whose records are not sufficient to model either an historic or a hybrid baseline. For further information about default non-zero baselines, see sections 4.12 and 4.15 of the Determination, and pages 19 to 21 and Appendix A of the Explanatory Statement for the <u>original Determination</u>. A default non-zero baseline is modelled in FullCAM by repeating the default baseline management event scenario over the baseline forecast period. This scenario consists of a sequence of comprehensive clearings that occur at 15 year intervals (refer to Table 3).

If project proponents can demonstrate that fire was used to suppress regrowth on land that is part of the same pastoral property as the CEA then:

- a management fire event may be <u>added occurring 7 years after each regeneration eventincluded</u> in each 15 year interval; and
- a <u>windrow</u>'<u>Windrow</u> and <u>burn</u>Burn' fire event may be added <u>occurring</u> 6 months after <u>each</u> comprehensive clearing event.

Table 3: Overview of simulation for calculating a Default Baseline

 Objective
 Calculate the default non-zero-baseline which estimates. Estimate average carbon stocks in athe carbon estimation area (CEA)over 100 years in the absence of an eligible offsets project. Averages are estimated from tThe average carbon stocks over the 100 years from the implementation date are used in the calculations within the methodimplementation date until 100 years after the implementation date (1200 monthsthe baseline forecast period), but the simulation period commences at an earlier date (see below).

Simulation period	From one day after the last comprehensive clearing event that occurred before the implementation date. Simulations end 100 years after the implementation date (the	
-	baseline forecast period).	
Events	Cycled every 15 years:	
permitted	 Regeneration; Clearing; 	Formatted: Indent: Left: 0 cm, Hanging: 0.63 cm, N bullets or numbering
	 Management fire 7 years after <u>regeneration</u> event – where sufficient evidence; and 	Formatted: Indent: Left: 0 cm, Hanging: 0.63 cm, N bullets or numbering
	Clearing	
	 Windrow and <u>burn fire 6 months after clearing event</u>Burn – where sufficient evidence- 	Formatted: Indent: Left: 0 cm, Hanging: 0.63 cm, N bullets or numbering
Outputs	Monthly totals for 'C mass of trees' (FullCAM Output = Carbon / Forest / Plants / C mass of trees)	
	Monthly totals for 'C mass of debris' (FullCAM Output = Carbon / Forest / Debris / C mass of forest debris)	

Overview of simulation for calculating a Hybrid Baseline

A hybrid baseline is suitable for project proponents who have evidence of two comprehensive clearings that occurred less than 15 years apart and before the implementation date. For further information about hybrid baselines, see sections 4.12 and 4.15 of the Determination, and pages 19 to 21 and Appendix A of the Explanatory Statement for the original Determination.

A hybrid baseline is modelled in FullCAM by repeating the hybrid baseline management event scenario over the baseline forecast period. This scenario consists of a sequence of comprehensive clearings that occur at two alternating intervals, one default interval of 15 years, followed by and one historic interval matching the interval between the last two clearings before the implementation date_(refer to Table 4).

If project proponents can demonstrate that fire was used to suppress regrowth on land that is part of the same pastoral property as the CEA, then:

- a management fire event may be included 7 years after the regeneration event in the 15 year default interval; and
- a windrow Windrow and burnBurn' fire event may be included 6 months after the comprehensive clearing event inat the beginning of the 15 year default interval.

If project proponents can demonstrate that fire was used in the second historic interval, -then corresponding that fire events set out in these Guidelines event-may be included in modelling that interval.

If documentary evidence shows, to the satisfaction of the Regulator, that a management event other than a comprehensive clearing occurred in the carbon estimation area during the historic interval, that management event may be included in the historic interval if it is a permitted event in Table 4 below.

Overview of simulation for calculating a Historic Baseline

Project proponents wishing to model an historic baseline must have evidence for at least three comprehensive clearings that occurred in the carbon estimation area (CEA) before the Formatted: Font: Not Italic

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implementation date. For further information about historic baselines, see sections 4.12 and 4.15 of the Determination, and pages 19 to 21 and Appendix A of the original Explanatory Statement.

A historic-non-zero baseline is modelled in FullCAM by repeating the historic baseline management event scenario over the baseline forecast period. There are stringent evidentiary requirements for modelling <u>an</u> historic baseline. Project proponents must have documentary evidence for each event modelled in the scenario (refer Table 4).

If documentary evidence shows, to the satisfaction of the Regulator, that a management event other than a comprehensive clearing occurred in the carbon estimation area before the implementation date, that event may be included in the historic baseline scenario if it is a permitted event in Table 4 below.

Table 4: Overview of simulation for calculating a Historic or Hybrid Baseline

Objective	Calculate historic and hybrid non-zero baselines which estimate average
	carbon stocks in a carbon estimation area over 100 years in the absence of an
	eligible offsets project. Averages are estimated from the implementation date
	until 100 years after the implementation date.
Simulation	One day after the most recent comprehensive clearing event. Simulations end
period	100 years after the implementation date (the baseline forecast period).
Events permitted	Regeneration
	Clearing
	Thinning
	Management fire
	Windrow and burn
	Burn
Outputs	Monthly totals for 'C mass of trees' (FullCAM Output = Carbon / Forest / Plants
	/ C mass of trees)
	Monthly totals for 'C mass of debris' (FullCAM Output = Carbon / Forest /
	Debris / C mass of forest debris)

2.4 Overview of simulation for calculating project carbon stocks

To determine the project carbon stocks, project Project proponents must model all events listed in the table below that reflect the actual management fire, thinning and regeneration events that occurred in the CEA during the entirety of the simulation period (from one day after the last comprehensive clearing before the implementation date until the end of the in the current and previous reporting period). (s) to determine the project carbon stocks as per section 4.18 of the Determination.

Table 5 Overview of simulation for calculating project carbon stocks

Objective	Calculate total carbon stocks in each CEA at the end of each reporting period.
	These carbon stocks will reflect the age of the regrowth within the CEA,
	observed climate, and activities and disturbance subsequent to the
	establishment of the offsets project.

Simulation	From one day after the last comprehensive clearing before the
period	implementation date. Simulations end at the end of the current reporting
-	period.
Events permitted	Regeneration
	Clearing
	Thinning
	Prescribed fire – to reduce fire risk
	WildfireWildfires – trees not killed
	WildfireWildfires – trees killed
	Management fire
	Windrow and burn
Outputs	Monthly totals for 'C mass of trees' (FullCAM Output = Carbon / Forest / Plants
	/ C mass of trees)
	Monthly totals for 'C mass of debris' (FullCAM Output = Carbon / Forest /
	Debris / C mass of forest debris)
	Monthly totals for emissions of CH ₄ from fire (FullCAM Output = Whole /
	Emissions / CH ₄ emitted due to fire)
	Monthly totals for emissions of N ₂ O from fire (FullCAM Output = Nitrogen /
	Whole / Emissions / N ₂ O emitted due to fire)

3. Setting up simulations for carbon estimation areas

The following steps must be followed for entering data into each tab in a FullCAM plot file. Each table provides a sequential list of steps in the right hand column. The left hand column indicates the Simulation Type that the steps are relevant to. Screenshots relevant to each set of steps, directly follow each table.

3.1 **Opening a file**

onnulation Type	Steps required		
C100_5%	 Open a new plot under the 'File' menu. Enter a name for the plot that 	•	Formatted: List Bullet
C10	reflects the identifier for the CEA and model scenario, e.g.		
Default baseline	'CEA1_baseline'.		
Historic baseline			
Hybrid baseline			
Project carbon			



3.2 Saving a plot file

Sin	nulation Type	Steps required		
C10 C10 De His Hy Pro	00_5% 0 fault baseline storic baseline brid baseline oject carbon	 Save the plot file using the 'File' menu on the FullCAM toolbar. Save the plot file regularly when setting up and running simulations. 		Formatted: List Bullet Formatted: List Bullet, Space After: 0 pt
	UIICAM 4.1.6.19417 - [2016 <u>E</u> dit <u>S</u> imulate I Open Ctrl+O Recent · New · Close Ctrl+W Save Ctrl+S Save As Save Copy As Save All Ctrl+Alt+S Exit Ctrl+Q	PRODUCTION] nternet Utilities Window Help III III IIII	_	

3.3 The Configuration Tab

Simulation Type	Steps required		
C100_5%	From the 'Plot' drop down menu, select 'Forest system'.	•F	Formatted: List Bullet, Indent: Left: 0 cm
C10	 Do NOT change any other settings. 		
Default baseline			
Historic baseline			
Hybrid baseline			
Project carbon			

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Plot	Document not ready (see red pages)	Configuration page ready		

3.4 The Timing Tab

Simulation Type	Steps required			
C100_5%	 Set the Simulation Timing to 'calendar'. 	-	(Formatted: List Bullet
C10	 Set the Output Steps to 'months'. 			
Default baseline				
Historic baseline				
Hybrid baseline				
Project carbon				
C100_5%	 Enter the date to start simulations as the implementation date. 	-	(Formatted: List Bullet
	• Enter the date to end the simulation as 100 years after the			
	implementation date.			
C10	Enter the date to start simulations as the day after the last	•		Formatted: List Bullet
	comprehensive clearing that occurred before the 10 year period that			
	ends on the implementation date. Enter the date to end the			
	simulation as the implementation date.		0	
Default baseline	•Enter the date to start simulations as one day after the last	•		Formatted: List Bullet
Historic baseline	comprehensive clearing before the implementation date.			
Hybrid baseline	• Enter the date to end the simulation as 100 years after the			
Project carbon	implementation date.		C	
C100_5%	 Do NOT change any other settings. 	•		Formatted: List Bullet
	 New tabs will appear once this tab has been completed. 			
Default baseline				
Historic baseline				
Hyprid baseline				
Project carbon				

	Explorer Log			
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Start and End	of Simulation			
Start date	1 Jan 2015			
End date	1 Jan 2115			
Dutput Steps Record the sta	te of the simulation Mont		0	

3.5 The Data Builder Tab

Simulation Type	Steps required		
C100_5%	Check the box to turn on the Data Builder	•	Formatted: List Bullet
C10	requires an internet connection		
Default baseline	 Enter the latitude and longitude (in decimal degrees) of the model 		
Historic baseline	point location central to the CEA being modelled and not in an		
Hybrid baseline	exclusion area.		
Project carbon	 Click the button to 'Download Spatial Data' and click 'OK' on the 		
	information box that pops up.		
	 Select 'Mixed species environmental plantings' from the dropdown 		
	box for 'Tree species' and then click the button to 'Download This		
	Species' and 'Yes' to 'Make mixed species environmental plantings		
	the initial tree species'. NB: Do NOT use the 'Mixed species		
	environmental plantings temperate' setting.		
	Do NOT download a regime (and therefore the events associated with		
	the regime) for this species.		
	Do NOT change any other settings.		

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Longitude 131.	D30 00 deg E Forest % downlo	ad 👘 🎋	NPI Region = No Region	
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	Download This Species			
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regimes				1
	Download Events for This Regime	Liear Agricultural EV	/ents	

3.6 The Site Tab

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I

Simulation Type	Steps required		
C100_5%	 Do NOT change any settings. 	•	Formatted: List Bullet
C10			
Default baseline			
Historic baseline			
Hybrid baseline			
Project carbon			

3.7 The Tree Tab

Simulation Type	Steps required	
C100_5% C10 Default baseline Historic baseline Hybrid baseline Project carbon	 Do NOT change any settings. 	Formatted: List Bullet

3.8 The Soil Tab

Simulation Type	Steps required	
C100_5%	 Do NOT change any settings. 	 Formatted: List Bullet
C10		
Default baseline		

Historic baseline	
Hybrid baseline	
Project carbon	

3.9 The Initial Conditions Tab

l

Simulation Type	Steps required	
C100_5%	 Click the button labelled 'Trees' and uncheck the box under 	Formatted: List Bullet
C10	'Existence' to show that the site did not have trees growing on it at	
Default baseline	the start of the simulation. Click 'OK'.	
Historic baseline	Click the button labelled 'Debris' and change all the default settings	
Hybrid baseline	for each debris pool to zero.	
Project carbon	 Do NOT change any other settings. 	



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3.10 The Events Tab

The Events Tab is where events for a simulation can be added and displayed in sequence.

 Table 6: Permitted Events for each Simulation Type

Simulation Type	Permitted Events	
C100_5%	Regeneration	
C10	Regeneration	
	Clearing	
	Thinning	
	Management fire	
	Windrow and burn fire	
Default baseline	Regeneration	Formatted: Left, Space After: 0 pt, Line spacing: single
	Clearing	
	Management fire – where sufficient evidence (see s 4.12 of the Determination)	
	Windrow and burn fire – where sufficient evidence (s 4.12 of the Determination)	Formatted: Left
Historic baseline	Regeneration	Formatted: Space After: 0 pt, Line spacing: single
Hybrid baseline	Clearing	
	Thinning	
	Management fire – where sufficient evidence (see s 4.12 of the Determination)	
	Windrow and burn fire – where sufficient evidence (s 4.12 of the Determination)	
Project carbon	Regeneration	
	Clearing	
	Thinning	

Management fire
Windrow and burn fire
Prescribed fire – to reduce fire risk
Wildfire – trees not killed
Wildfire – trees killed

About Config Dutput Windows	guration Explo	Timin orer	ng Log	Data Builder	Site Trees	Soil Initial	Conditions Events	
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				▼ Date	Name	Note	98	

3.10.1 Adding a regeneration event

The below steps and notes must be followed to add a regeneration event. There are different requirements for modelling a regeneration event according Regeneration events must be added to the scenario type.

Where a regeneration event must be added following a comprehensive clearing or a wildfire - trees killed event, also follow FullCAM event queue for each CEA to model the below steps and notes.

Notes on timing for different scenario types

For the project carbon scenario, the timingestablishment of a regeneration event must be supported by evidence (subsection 4.19(2) and paragraph 5.5(b) of the Method), as well as conform with the

input requirements specified here (paragraph 4.18(2)(a) of the Method). The timing of a regeneration event must correspond with the establishment of forest potential within the CEA.

Unless the project area is a **pre-existing project area**, tThe timing of a regeneration event in the project carbon scenario cannot be more than 14 years prior to the project registration date, or where the land comprising the CEA was added to the project area through a project area variation, cannot be more 14 years prior to the date of that variation. For the purposes of this paragraph, a **pre-existing project area** is a project area that was:

- on 13 December 2017 a project area of an eligible offset project applying the Determination;
 or
- a project area included in an application under section 22 of the Act to be an eligible offsets project to which the Determination would apply received by the Regulator before 13 December 2017; or
- an area of land proposed to be included in an eligible offsets project which applied the Determination on 13 December 2017 in an application under section 23 of *the Carbon Credits* (*Carbon Farming Initiative*) Rule 2017 received by the Regulator before 13 December 2017.

This limitation aims to ensure the estimation of project carbon stocks is conservative. Permitting the modelling of longer periods of regeneration prior to registration may yield carbon stock levels inconsistent with the land not having forest cover at the project registration or variation date (as required for eligibility under section 2.4 of the Method). The limitation also aligns with an assumption of the default baseline scenario of the Method. The default baseline contains the assumption that after 14 years of regeneration the vegetation on the land would have been cleared again for pastoral purposes. Permitting the modelling of shorter periods of regeneration under the default baseline (14 years) than under the project scenario (>14 years) could underestimate the baseline amount and not provide a conservative estimate of the overall project carbon abatement eligible for crediting.

For the default baseline scenario, a regeneration event occurs 12 months potential after each comprehensive clearing. In the absence of evidence to the contrary, the timing of attainment of forest potential is deemed to occur one year after each comprehensive clearing. See subsection 4.12(6) and paragraph 4.15(2)(b) event. Evidence is required to set the date of regeneration to any other time after clearing. See section 4.6 of the Determination for details.

For the <u>C10, hybrid and historic</u>default<u>baseline</u> scenarios, regeneration events and clearing events should recur on a 15 year cycle for the <u>timing</u>duration of the simulation (i.e. 12 months from clearing to regeneration plus 14 years of growth prior to re clearing).

Note: Where there is evidence of regeneration following a wildfire where trees were killed, a regeneration event <u>is must be added to the events queue</u> 12 months after each <u>comprehensive</u> <u>clearing</u>, <u>wildfire</u> <u>trees killed event</u>, unless there is specified evidence <u>supports setting</u> to set the date <u>to anotherof regeneration to some other</u> time<u>, after clearing</u> (See section 4.6, and <u>subsections 4.8(5)</u>, <u>4.12(9) and 4.12(15)</u> of the Determination.).

Steps for the Project Carbon Scenario Modelling

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Note: Where there is evidence of regeneration following a windrow and burn following clearing, a regeneration event must be added to the events queue 6 months after each windrow and burn event.

Simulation	Steps required
Туре	
Project carbon	Glick the 'New' button under 'Event Editing' to create a new event.
Project carbon	 Enter the date in the blank field beside the 'Timing' section. <u>This will</u> <u>need to be entered in the format dd mmm yyyy.</u> The timing of a regeneration event in the project carbon scenario cannot be more than 14 years prior to the project registration date, or where the land comprising the CEA was added to the project area through a project variation, cannot be more 14 years prior to the date of that variation.
C100_5% C10 Default baseline Historic baseline Hybrid baseline Project carbon	 Click the 'New' button under 'Event Editing' to create a new event. In the drop down menu next to 'Type', select 'Plant trees'. Click 'Insert standard values'. Select the row with the 'Event Name' of 'Plant trees: natural regeneration' and then click 'OK' and 'Yes' to insert the name of the standard event. Do NOT change any other setting.
	 Click 'OK' to finish adding the event to the event queue.

Steps for the Baseline and Materiality Test Modelling

		_	
Simulation	Steps required		
Туре			
<u>C100_5%</u>	Click the 'New' button under 'Event Editing' to create a new event.		
<u>C10</u>			
Default baseline			
Historic baseline			
Hybrid baseline			
C100_5%	Insert the simulation start date in the blank field beside the 'Timing'	•	Formatted: List Bullet
	section. This will need to be entered in the format dd mmm yyyy.		
Default baseline	 EnterFor the date that is 12 months afterfirst regeneration event, 	•	Formatted: List Bullet
	insert the time when regeneration commenced following the most		
	recent comprehensive clearing-event in the blank field beside the		
	'Timing' section. This will need to be entered in the format dd mmm		
	yyyy. For all other regeneration events insert the date 15 years after		
	the previous regeneration event.		
C10	 Enter the date as determined from the above notes 	•	Formatted: List Bullet, Indent: Left: 0 cm, Hanging: 0.63
Historic baseline	regeneration event, insert the time when regeneration commenced		cm, Space Arter: 6 pt
Hybrid baseline	following the most recent comprehensive clearing event in the blank		
Project carbon	field beside the 'Timing' section. This will need to be entered in the		
	format dd mmm yyyy. For all subsequent regeneration events insert		
	the date for each to represent the observed or default interval		
	between regeneration events.		
C100 5%	 In the drop down menu next to 'Type', select 'Plant trees'. 		Formatted: List Bullet
C10			
Default baseline			

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Historic baseline	•Click 'Insert standard values'. Select the row with the 'Event Name' of
Hybrid baseline	'Plant trees: natural regeneration' and then click 'OK' and 'Yes' to
Project carbon	insert the name of the standard event.
	 Do NOT change any other setting.
	 Click 'OK' to finish adding the event to the event queue.

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Bark Age [yr]					
Leaves	es				
Coarse roots					
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3.10.2 Adding a clearing event

These steps must be <u>followed to add arepeated for each</u> clearing event, <u>which corresponds to a</u> <u>comprehensive</u> that occurs in each CEA during the simulation period. For each clearing <u>referred to in</u> <u>the Determinationevent the date must reflect the date of that clearing event</u>.

Simulation Type	Steps required		
C100_5%	Not permitted NOT PERMITTED.	•	Formatted: List Bullet
Project carbon	Not permitted NOT PERMITTED.	•	Formatted: List Bullet
C10 Default baseline Historic baseline Hybrid baseline	 Click the 'New' button under 'Event Editing' to create a new event. 	•	Formatted: List Bullet
C10 Historic baseline Hybrid baseline	 Insert the date of the clearing event in the blank field beside the 'Timing' section. For the first clearing event, insert the date of the clearing event in the blank field beside the 'Timing' section based on the interval observed historically observation what occurred historically. This will need to be entered in the format dd mmm yyyy. 		
	 For subsequent clearing events, insert the date of clearing in this field to represent the observed <u>date</u> or default interval between comprehensive clearings <u>as per section 4.6 of the Determination</u>. 	•	Formatted: List Bullet
Default baseline	 Insert the date of the clearing event in the blank field beside the 'Timing' section. The intervals between events must reflect those that occurred historically. This will need to be entered in the format dd mmm yyyy. Each clearing event will be 14 years after the previous regeneration event. 		Formatted: List Bullet
C10	In the drop down menu next to 'Type', select 'Thin'.	•	Formatted: List Bullet
Default baseline Historic baseline Hybrid baseline	 Click 'Insert standard values'. Select the row with 'Event Name' of 'Initial clearing: No product recovery' and then click 'OK' and 'Yes' to insert the name of the standard event. 		
	 Ensure that the box next to 'Affected portion' contains the value '100' to indicate a clearing event. Do NOT change any other settings. 		
	Click OK' to finish adding the event to the event queue.		

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Leaf Litter to	Biofuel			+ 0	[yr]
Loor Litter to.	Diorder			Replace removed trees	with new trees (of age 0)

Species /	Event Name	Event Label	
Mixed species environmental planting	Initial clearing: no product recovery		
Mixed species environmental planting	Initial clearing: product recovery		
Mixed species environmental planting	Prune (Selective, 33%)		
Mixed species environmental planting	Prune (Selective, 33%) 2		
Mixed species environmental planting	Prune (Selective, 33%) 3		
Mixed species environmental planting	Prune (Selective, 33%) 4		

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3.10.3 Adding a thinning event

These steps must be <u>followed to add arepeated for each thinning event that occurs in each CEA during</u> the simulation period. For each thinning event the date must reflect the date of the <u>a</u> thinning event.

Simulation Type	Steps required		
C100_5%	Not permitted NOT PERMITTED	•	Formatted: List Bullet
Default baseline	Not permitted NOT PERMITTED	•	Formatted: List Bullet
C10	1. Click the 'New' button to create a new event.	-	Formatted: List Number
Historic baseline	2. Insert the date of the thinning event in the blank field beside the		
Hybrid baseline	'Timing' section. This will need to be entered in the format dd mmm		
Project carbon	yyyy. The intervals between events must reflect those that occurred		
	historically.		
	3. In the drop down menu next to 'Type', select 'Thin'.		
	4. Click 'Insert standard values'. Select the row with 'Event Name' of		
	'Initial clearing: No product recovery' and then click 'OK' and 'Yes' to		
	insert the name of the standard event.		
	5. In the box next to 'Affected portion – the percentage of forest		
	affected by thin' change the number to an estimate of the proportion		
	of the stems that were killed in the thinning. You must report on how		
	the estimate was derived in your project report.		
	6. Do NOT change any other settings.		
	7. Click 'OK' to finish adding the event to the event queue.		

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Log gr Stems to: 100 0	Deadwood Biofuel Paper and pulp Packing wood Fumiture Fiberboard Construction Mill residue Roots to: 100 wood to: 0 wood to: 0	Just Pranches to 100 0	Deadwood Biofuel Paper and pulp Packing wood Fumiture Fiberboard Construction Mill residue	Bark to: 100 0 0 0 0 0 0 0 0 0 0 0 0	Bark litter Biofuel Paper Mill residue Leaf litter Biofuel Disto: Coarse dead roots Biofuel	Relative Allocation Branci Branci Bark Leav Coars Coar	n Multipliers	thin: 100.0%
Log gr Stems to: 100 0	Deadwood Biofuel Paper and pulp Packing wood Fiberboard Construction Mill residue Roots to: 100 wood to: 0 Litter to: 0	Branches to 100 <	Deadwood Biofuel Paper and pulp Packing wood Fumiture Fiberboard Construction Mill residue	Bark to: 100 0 100.0 Leaves to: 100 0 100.0 Coarse Roc 100 0 100.0	Bark litter Biofuel Paper Mill residue Leaf litter Biofuel Dis to: Coarse dead roots Biofuel	Relative Allocation	n Multipliers s ches es es se roots s [yr] and Replac ved by this t	cement thin: 100.0% ∬ × Average age of tree ∬ × Age of the oldest tre ∬ kr]

3.10.73.10.4 Adding fire events

3.10.7.1<u>3.10.4.1</u> Adding a management fire event

These steps must be <u>followed to add a repeated for each</u>-management fire event-that follows a clearing event that occurs in a CEA during the simulation period. A management fire event encourages grass for pasture. It is a fire that occurs within a clearing interval and is used to set back the regrowth, killing a substantial proportion of the above ground plant parts. For each of these events, the date must reflect the date of that event.

Simulation Type	Steps required		
C100_5%	Not permitted NOT PERMITTED	•	Formatted: List Bullet
C10	Not permitted NOT PERMITTED	•	Formatted: List Bullet

Simulation Type	Steps required
Default baseline Historic baseline Hybrid baseline Project carbon	 Click on the 'New' button to create a new event. In the blank field besides the 'Timing' section, insert the date of the management fire in the simulation period. The intervals between events must reflect those that occurred historically. For example, for default values used in baselines, this is 7 years after the regeneration event. In the drop down menu next to 'Type', select 'Forest fire'. Click 'Insert standard values'. Select the row with 'Event Name' of 'Wildfire – trees killed' and then click 'OK' and 'Yes' to insert the name of the standard event. Change the name of the event to 'managementManagement fire'. CHANGE THE SETTINGS TO MATCH THOSE IN THE SCREENSHOT BELOW. Tick the 'Enable biomass based age adjustments' box.
	<u>a.</u> Click OK to mish adding the event to the event queue.

() Event × Auto Name 0 ОК Name Notes Usage... Type Forest fire Cancel Timing 8 Calendar date

21 Dec 2016 Simulate Days 0 Add Days 0 Forest Fire Insert Standard Values... Leaf Regrowth Percentage Affected Portion Age Adjustment Percentage of forest affected by fire Percentage of leaves that 'automatically' regrow in year after fire Enable biomass based age adjustment Destination Percentages in the Affected Portion Decomposable Debris To Atmos. To Inert Soil Tree To Atmos. To Debris Stems Deadwood Branches Chopped wood Bark Bark litter Leaf litter Leaves Coarse roots Coarse dead roots Fine roots Fine dead roots ResistantDebris To Atmos. To Inert Soil Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots

Formatted: List Number, Numbered + Level: 1 + Numbering Style: 1, 2, 3, ... + Start at: 1 + Alignment: Left + Aligned at: 0 cm + Tab after: 0.63 cm + Indent at: 0.63 cm

Select A Standard Event			
Constant of the standard event	Front Maria	Event Labor	Event Deventation
Apoues / Mixed species environmental planting	Prescribed hum	All regions	Event Description
Vixed species environmental planting	Site prep: Broadcast Burn	All regions	Forest fire on 100%
Mixed species environmental planting	Site prep: Windrow and burn	All regions	Forest fire on 100%
Nixed species environmental planting	Wildfire - trees killed	All regions	Forest fire (cleaning)
fixed species environmental planting	Wildfire - trees not killed	All regions	Forest fire on 100%
		0	OK Cancel
) Event			Viet of Article
lame			Auto Name 🛛 OK
ype Forest fire	Notes		Usage
11-111			
iming			
Simulate Calendar da	ate 🔹 21 Dec 2016	Days 0	Add Days
Destination Percentages in th	ne Affected Portion Decomposable Debri	S To Atmos To loost Col	
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Branchee	Channed wood	· · · · · · · · · · · · · · · · · · ·	
	Chopped wood	· · · · · · · · · · · · · · · · · · ·	
Bark	Bark litter		
Leaves	Leaf litter		
Coarse roots	Coarse dead root	S	
Fine roots	Fine dead roots		
	Derty (D.L.)		
	Resistantuebris	To Atmos. To Inert Soil	
	Deadwood		
	Chopped wood		
	Bark litter		
	Lasf Inter	· · · · · · · · · · · · · · · · · · ·	
	Lear inter		
	Coarse dead root	S	
	Fine dead roots		
Select A Standard Event			
			E I D I I D I I I I I I I I I I I I I I

pecies /	Event Name	Event Label	Event Description
lixed species environmental planting	Prescribed burn	All regions	Forest fire on 100%
fixed species environmental planting	Site prep: Broadcast Burn	All regions	Forest fire on 100%
lixed species environmental planting	Site prep: Windrow and burn	All regions	Forest fire on 100%
lixed species environmental planting	Wildfire - trees killed	All regions	Forest fire (clearing)
fixed species environmental planting	Wildfire - trees not killed	All regions	Forest fire on 100%

) Event							
Name Manage	ment Fire	~				Auto Name	0
Type Forest fir	e	~	Notes			Usage	
Time in a							
	(m.)]				
Simulate	Caler	ndar date	▼ 21 Dec 2016		Days	0 Add Days	
and Fire						_	
rorest Fire						In	sert Standard Value
Affected Po	rtion		Leaf Regrowth Percer	itage		Age Adjustment	
100	Percentage o	fforest	0 Percentage	e of leaves	that	I Enable biomass base	ed age adjustment
	anected by n	e	automatica	ally regrow	in year alter fire	,	
Destination	Percentages	s in the Affec	ted Portion				
Tree	To Atmos.	To Debris	Decomposable Debris	To Atmos.	To Inert Soil		
Stems	0	30	Deadwood	75	0		
Branches	0	30	Chopped wood	0	0		
-	15	15	Bark litter	65	0		
Bark	00	40	Leaf litter	65	0		
Bark Leaves	20						
Bark Leaves Coarse roots	20	0	Coarse dead roots	0	0		
Bark Leaves Coarse roots Fine roots	20	0	Coarse dead roots Fine dead roots	0	0		
Bark Leaves Coarse roots Fine roots	20	0	Coarse dead roots Fine dead roots ResistantDebris	0 0	0 0		
Bark Leaves Coarse roots Fine roots	20	0 2	Coarse dead roots Fine dead roots Resistant Debris	0 0 To Atmos.	0 0 To Inert Soil		
Bark Leaves Coarse roots Fine roots	20	0	Coarse dead roots Fine dead roots ResistantDebris Deadwood	0 0 To Atmos. 75	0 0 To Inert Soil 0		
Bark Leaves Coarse roots Fine roots	20	0	Coarse dead roots Fine dead roots Resistant Debris Deadwood Chopped wood Brid a tare	0 0 To Atmos. 75 0	To Inert Soil		
Bark Leaves Coarse roots Fine roots	20	0	Coarse dead roots Fine dead roots ResistantDebris Deadwood Chopped wood Bark litter	0 0 To Atmos. 75 0 65	0 0 To Inert Soil 0 0 0		
Bark Leaves Coarse roots Fine roots	20	0	Coarse dead roots Fine dead roots Resistant Debris Deadwood Chopped wood Bark litter Leaf litter	0 0 To Atmos. 75 0 65 65	0 0 To Inert Soil 0 0 0 0		
Bark Leaves Coarse roots Fine roots	20	0	Coarse dead roots Fine dead roots Resistant Debris Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots	0 0 To Atmos. 75 0 65 65 0	0 0 To Inert Soil 0 0 0 0 0		

3.10.7.2<u>3.10.4.2</u> Adding a windrow and burn fire event

These steps must be repeated for each windrow and burn fire event that follows a clearing event that occurs in a CEA. A windrow and burn fire event reduces the amount of debris that remains after the clearing event. Evidence is required to support modelling a windrow and burn event. See subsection 4.12(5) regarding evidence to support modelling this event under a default baseline scenario, and subsections 4.8(5), 4.12(10) and 4.12(14) for C10, hybrid baseline, and historic baseline scenarios respectively.

For each of these events, the <u>default baseline scenario</u>, where <u>included</u> a windrow and burn event is to be included, it must be modelled as occurring six months after each clearing eventdate MUST reflect the interval between events.

Simulation Type	Steps required		
C100_5%	Not permitted NOT PERMITTED	•	Formatted: List Bullet
Project carbon	Not permitted NOT PERMITTED	•	Formatted: List Bullet

C10	9. Click on the 'New' button to create a new event.	Formatted: List Number, Numbered + Level: 1 + Numbering
Default baseline	10. Insert the date of the windrow and burn fire in the simulation period	Style: 1, 2, 3, + Start at: $1 + \text{Alignment: Left} + \text{Aligned at:}$
Historic baseline	in the blank field beside the 'Timing' section.	
Hybrid baseline	11. In the drop down menu next to 'Type', select 'Forest fire'.	
	12. Click 'Insert standard values'. Select the row with 'Event Name' of 'Site	
	prep: Windrow and burn' and then click 'OK' and 'Yes' to insert the	
	name of the standard event.	
	13. Do NOT change any other setting.	
	14. Click 'OK' to finish adding the event to the event queue.	

Event							
ame						Auto Name	ОК ОК
vpe Forest fir	re	•	Notes			Usage	Cancel
iming							
🔽 Simulate	Cale	endar date	✓ 30 May 2018		Days (Add Days	
orest Fire							Insert Standard Values
Affected Po	ortion		Leaf Regrowth Percer	ntage		Age Adjustment	Inselt Staridald Values
	Percentage affected by f	of forest lire	Percentage 'automatica	e of leaves ally' regrow	that in year <mark>afte</mark> r fire	Enable biomass	based age adjustment
Destination	Percentane	e in the Affe	retad Portion				
Tree	To Atmos.	To Debris	Decomposable Debris	To Atmos.	To Inert Soil		
Stems	1		Deadwood				
Branches			Chopped wood	-			
Bark			Bark litter				
Leaves			Leaf litter				
Coarse roots	5		Coarse dead roots				
Fine roots			Fine dead roots				
			Resident Datas				
			Resistant Debhs	To Atmos.	To Inert Soil		
			Deadwood				
			Chopped wood				
			Bark litter				
			Leaf litter				
			Coarse dead roots				
			Fine dead roots				
) Select A S	Standard Evi	ent					
Species 7			Event Name		Event Lat	bel	Event Description
Mixed species	s environmen	ntal planting	Prescribed burn		All regions	s	Forest fire on 100%
wixed specie:	s environmen	ntal planting	Site prep: Broadcast Burn Site prep: Windrow and b	um	All regions	5	Forest fire on 100%
Mixed specie:	s environmen	ntal planting	Wildfire - trees killed		All regions	S	Forest fire (clearing)
Mixed specie:	s environmen	ntal planting	Wildfire - trees not killed		All regions	S	Forest fire on 100%

me Site prep	Windrow an	d bum				Auto Name	0	<u>O</u> K
pe Forest fire	,	•	Notes			Usage]	<u>C</u> ancel
iming								
Simulate	Caler	ndar date			Days 0	Add Days		
orest Fire								
Affected Por	tion		Leaf Regrowth Percer	atane		Ane Adjustment	insert Standard	values
100	Deservations	t farmed	Demonstration Contraction	adyc				
100	affected by fi	r rorest 'e	automatica	ally' regrow	in year after fire	Enable biomass	based age adjustr	ment
estination F	ercentage	s in the Affec	ted Portion					
Tree	To Atmos.	To Debris	Decomposable Debris	To Atmos.	To Inert Soil			
Stems	0	0	Deadwood	60	0			
Branches	0	0	Chopped wood	0	0			
Bark	0	0	Bark litter	100	0			
Leaves	0	0	Leaf litter	100	0			
Coarse roots		0	Coarse dead roots	10	0			
ordierriete		0	Fine dead roots	0	0			
Fine roots			Pagistant Dabrie					
Fine roots			- Colocum Cookia	To Atmos.	To Inert Soil			
Fine roots			Deadwood	60	0			
Fine roots			Chopped wood	0	0			
Fine roots				100				
Fine roots			Bark litter	100	0			
Fine roots			Bark litter Leaf litter	100	0			
Fine roots			Bark litter Leaf litter Coarse dead roots	100 100 10				

3.10.7.3<u>3.10.4.3</u> Adding a prescribed fire event – to reduce fire risk

These steps must be <u>followed to add a repeated for each</u>-prescribed fire event <u>– to reduce fire risk</u>. <u>These events are</u> aimed at reducing fuel loads and hence fire risk. <u>They, that occurs in a CEA during</u> <u>the simulation period</u>. A prescribed fire is used to control the accumulation of the debris pool. <u>TheFor</u> <u>each of these events the</u> date <u>modelled</u> must reflect the <u>actual</u> date of that event.

Simulation Type	Steps required		
C100_5%	Not permitted NOT PERMITTED	•(1	Formatted: List Bullet
C10	Not permitted NOT PERMITTED	•[Formatted: List Bullet
Default baseline	 Not permitted NOT PERMITTED 	•[Formatted: List Bullet
Historic baseline	Not permitted NOT PERMITTED	• [I	Formatted: List Bullet
Hybrid baseline	 Not permitted NOT PERMITTED 	•	Formatted: List Bullet
Project carbon	 <u>15.</u> Click on the 'New' button to create a new event. <u>16.</u> Insert the date of the prescribed fire in the simulation period in the blank field beside the 'Timing' section 		Formatted: List Number, Numbered + Level: 1 + Numbering Style: 1, 2, 3, + Start at: 1 + Alignment: Left + Aligned at: 0 cm + Tab after: 0.63 cm + Indent at: 0.63 cm
	 17. In the drop down menu next to 'Type', select 'Forest fire'. 18. Click 'Insert standard values'. Select the row with 'Event Name' of 'Prescribed burn' and then click 'OK' and 'Yes' to insert the name of the standard event. 19. Tick the 'Enable biomass based age adjustments' box. 20. Do NOT change any other setting. 21. Click 'OK' to finish adding the event to the event queue. 		

41

							Name	0	
ame						Auto	Name		UK
ype Forest fire		•	Notes			Usa	ige		Cancel
Fiming									0
Simulate	Calenc	lar date			Days (0 Add D	ays		
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-orest Fire							Inser	Standard \	alues
Affected Portio	n		Leaf Regrowth Percer	itage		Age Adjus	iment		
Per	centage of ected by fire	forest	Percentag automatic	e of leaves ally' regrow	that in year after fire	Enable bi	iomass based	age adjustr	ent
Destination Pen	centages	in the Affe	cted Portion						
Tree T	o Atmos.	To Debris	Decomposable Debris	To Atmos.	To Inert Soil				
Stems			Deadwood						
Branches			Chopped wood						
Bark			Bark litter	-					
Leaves			Leaf litter						
Coarse roots			Coarse dead roots	-					
Fine roots			Fine deau roots						
			Resistant Debris	To Atmos.	To Inert Soil				
			Deadwood						
			Chopped wood						
			Bark litter						
			Leaf litter						
			Coarse dead roots						
			Fine dead roots						
									_
Select A Star	ndard Eve	nt							
Species /			Event Name		Even	t Label		Ev	ent Description
Mixed species er Mixed species er	nvironment wironment	al planting	Prescribed burn Site prep: Broadcast B	um.	All re All re	gions gione		Fo	est fire on 100%
Mixed species en	nvironment	al planting	Site prep: Windrow and	bum	All re	gions		Fo	est fire on 100%
Mixed species en	nvironment	al planting	Wildfire - trees killed		All re	gions		Fo	rest fire (clearing)
Mixed species en	nvironment	al planting	Wildfire - trees not kille	1	All re	gions		Fo	est fire on 100%
							0	ок	Cancel

Event							
ame Prescribe	d burn					Auto Name] 0
no Forget fire		-14	Natas				
pe rolestine			wotes			Usage	
iming							
✓ Simulate	Caler	ndar date			Days 0	Add Days	
orest Fire	tion		Leaf Regrowth Percer	ntage		Age Adjustment	Insert Standard Valu
100	Percentage o affected by fi	uf forest re	7 Percentag 'automatica	e of leaves ally' regrow	that in year after fire	C Enable biomass	based age adjustment
estination F	'ercentage:	s in the Affec	ted Portion				
Tree	To Atmos.	To Debris	Decomposable Debris	To Atmos.	To Inert Soil		
Stems	0	0	Deadwood	15	0		
Branches	0	0	Chopped wood	0	0		
Bark	2	0	Bark litter	80	0		
	2	5	Loof litter	90			
Leaves			Ledi ilitei		0		
Leaves Coarse roots	-	0	Coarse dead roots	0	0		
Leaves Coarse roots Fine roots	-	0	Coarse dead roots Fine dead roots	0	0		
Leaves Coarse roots Fine roots		0	Coarse dead roots Fine dead roots Resistant Debris	0 0 To Atmos.	0 0 0 To Inert Soil		
Leaves Coarse roots Fine roots		0	Coarse dead roots Fine dead roots Resistant Debris Deadwood	0 0 To Atmos. 15	0 0 0 To Inert Soil 0		
Leaves Coarse roots Fine roots		0	Coarse dead roots Fine dead roots ResistantDebris Deadwood Chopped wood	0 0 To Atmos. 15 0	To Inert Soll		
.eaves Coarse roots Fine roots		0	Coarse dead roots Fine dead roots ResistantDebris Deadwood Chopped wood Bark litter	0 0 To Atmos. 15 0 80	0 0 0 0 0 0 0		
Leaves Coarse roots Fine roots		0	Coarse dead roots Fine dead roots Resistant Debris Deadwood Chopped wood Bark litter Leaf litter	0 0 To Atmos. 15 0 80 90	0 0 0 To Inert Soll 0 0 0		
Leaves Coarse roots Fine roots	-	0	Coarse dead roots Fine dead roots ResistantDebris Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots	0 0 To Atmos. 15 0 80 90 0	0 0 0 0 0 0 0 0 0 0 0 0		

3.10.7.4<u>3.10.4.4</u> Adding a wildfire – trees not killed event

These steps must be <u>followed to add arepeated for each 'wildfire – trees not killed' event that occurs</u> in a CEA during the simulation period. For each wildfire – trees not killed event the date must be the date on which the event occurred.

Simulation Type	Steps required		
C100_5%	Not permitted NOT PERMITTED	•(Fo
C10	Not permitted NOT PERMITTED	(Fo
Default baseline	Not permitted NOT PERMITTED	{	Fo
Historic baseline	Not permitted NOT PERMITTED	•	Foi
Hybrid baseline	Not permitted NOT PERMITTED		Foi
Project carbon	 Click on the 'New' button to create a new event. Insert the date of the wildfire where trees are not killed in the simulation period in the blank field beside the 'Timing' section. In the drop down menu next to 'Type', select 'Forest fire'. Click 'Insert standard values'. Select the row with 'Event Name' of 'Wildfire – trees not killed' and then click 'OK' and 'Yes' to insert the name of the standard event. Tick the 'Enable biomass based age adjustments' box. Do NOT change any other setting. Click 'OK' to finish adding the event to the event queue. 		For Nur 1 + cm

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) Event								
lame						Auto Name	0	ОК
ype Forest fire		Notes				Usage		Cancel
liming	(<u>-</u>							
Simulate	Calendar date			Days 0	A	dd Days		
Enroat Eiro						e		
-orest Fire						Ins	ert Standard V	alues
Affected Portion	<u>k</u>	Leaf Regrowth Perc	entage		Age Ad	ljustment		
Perce	entage of forest ed by fire	Percenta 'automati	ige of leaves ically' regrow	that in year after fire	🔲 Enat	ole biomass base	d age adjustm	ent
Destination Perce	entages in the Af	fected Portion						
Tree To	Atmoe To Dahrie	Decomposable Debr	S To Atmos	To Inert Soil				
Stems	runos. To Debns	Deadwood	TO ALMOS.	TO INCIL SOIL				
Brancher		Chopped wood	-					
Rade		Bark litter	-	()				
		Lest litter	-					
Corres moto		Coome dead and		()				
Coarse roots		Eine dead mete	5					
rine roots		Fine dead roots						
		ResistantDebris	To Atmos	To Inert Soil				
		Deadwood	To ventos.					
		Chopped wood		() -				
		Bark litter	-					
		Leaf litter		() 				
		Coarse dead root	8					
		Fine dead mote						
Select A Stand	ard Event							×
Species /		Event Name		Event La	abel		Event	Description
Mixed species envi	ironmental planting	Prescribed burn		All region	าร		Forest	fire on 100%
Mixed species envi	ironmental planting	Site prep: Broadcast E	Bum	All region	าร		Forest	fire on 100%
Mixed species envi	ironmental planting	Site prep: Windrow an	id bum	All region	ns		Forest	tire on 100%
mixed species envi	ironmental planting	Wildfire - trees killed	d	All region	15		Fores	fire on 100%
IVIDENT SPECIES ET 197							- of GS	
Williad species envi								
Mixed species envi								
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pe Forest fi	re	•	Notes				Usage	C
iming								
Simulate	Caler	ndar date	▼ 1 Aug 2017		Days 0	Ad	d Days	
orest Fire							Ins	ert Standard Values
Affected Po	ortion		Leaf Regrowth Percer	ntage		Age Ad	justment	
100	Percentage o	of forest	100 Percentage	e of leaves	that	🔽 Enabl	e biomass base	d age adjustment
	affected by fi	re	automatica	ally regrow	in year after fire			
	0		and Dealing					
Tree	rercentage	s in the Are	Decomposable Debris		2011/20			
	Lo Atmos	lo Debrie	popolitipopopio popilo	Lo Atmos	Lo Inert Soil			
ince	TO Adrios.	TO DODIS		0741103.	0			
Stems	5	0	Deadwood	25	0			
Stems Branches	5 10	0	Deadwood Chopped wood	25 0				
Stems Branches Bark	5 10 5		Deadwood Chopped wood Bark litter	25 0 100				
Stems Branches Bark Leaves	5 10 5 80	0 0 20	Deadwood Chopped wood Bark litter Leaf litter	25 0 100 100				
Stems Branches Bark Leaves Coarse roots	5 10 5 80	0 0 0 20 5	Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots	25 0 100 100 20				
Stems Branches Bark Leaves Coarse roots Fine roots	5 10 5 80	0 0 0 20 5 0	Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots	25 0 100 20 0				
Stems Branches Bark Leaves Coarse roots Fine roots	10 Adrius. 5 10 5 80	0 0 0 20 5 0	Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris	25 0 100 20 0 To Atmos.	0 0 0 0 0 0 0 0 0 0			
Stems Branches Bark Leaves Coarse roots Fine roots	5 10 5 80 8	0 0 0 20 5 0	Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood	25 0 100 20 0 To Atmos. 25	0 0 0 0 0 0 0 0 0 0			
Stems Branches Bark Leaves Coarse roots	5 10 5 80	0 0 0 20 5 0	Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood Chopped wood	25 0 100 20 0 To Atmos. 25 0	0 0 0 0 0 0 0 0 0 0 0 0 0			
Stems Branches Bark Leaves Coarse roots	10 Adritis. 5 10 5 80	0 0 0 20 5 0	Deadwood Chopped wood Bark Itter Leaf Itter Coarse dead roots Fine dead roots Resistant Debris Deadwood Chopped wood Bark Itter	25 0 100 100 20 0 To Atmos. 25 0 100	To Inert Soil			
Stems Branches Bark Leaves Coarse roots Fine roots	10 Adritis. 5 10 5 80	0 0 0 20 5 0	Deadwood Chopped wood Bark litter Leaf litter Coarse dead roots Fine dead roots Resistant Debris Deadwood Chopped wood Bark litter Leaf litter	25 0 100 100 20 0 To Atmos. 25 0 100 100	To Inert Soil			
Stems Branches Bark Leaves Coarse roots	5 10 5 80	0 0 20 5 0	Deadwood Chopped wood Bark liter Leaf liter Coarse dead roots Fine dead roots Deadwood Chopped wood Bark liter Leaf liter Coarse dead roots	25 0 100 100 20 0 To Atmos. 25 0 100 100 20	To Inert Soil 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			

3.10.7.5<u>3.10.4.5</u> Adding a <u>Wildfire</u> - trees killed event

These steps must be <u>followed to add arepeated for each</u> wildfire – trees killed event that occurs during the simulation period and for each wildfire – trees killed event the date must be the date on which the event occurred.

Simulation Type	Steps required	
C100_5%	Not permitted NOT PERMITTED	•
C10	Not permitted NOT PERMITTED	•
Default baseline	Not permitted NOT PERMITTED	
Historic baseline	Not permitted NOT PERMITTED	-
Hybrid baseline	Not permitted NOT PERMITTED	•
Project carbon	22. Click the 'New' button to create a new event.	•
	23. Insert the date that the wildfire – trees killed event in the blank field	
	beside the 'Timing' section. This will need to be entered in the format	
	dd mmm yyyy.	
	24. In the drop down menu next to 'Type', select 'Forest Fire'.	
	25. Click 'Insert standard values'. Select the row with 'Event Name' of	
	'Wildfire – trees killed' and then click 'OK' and 'Yes' to insert the name	
	of the standard event.	
	<u>26.</u> Click 'OK'.	
	27. Do NOT change any other settings.	
	28. Click 'OK' to finish adding the event to the event queue.	

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Branches	Chopped wood			
Bark	Bark litter			
Leaves	Leaf litter			
Coarse roots	Coarse dead roots			
Fine roots	Fine dead roots			
	Resistant Debris To Atmos	To Inert Soil		
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	Bark litter			
	Leaf litter			
	Coarse dead roots			
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Species /	Event Name	Event Label		Event Description
Mixed species environmental planting	Prescribed burn	All regions		Forest fire on 100%
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3.10.8<u>3.10.5</u> Creating and cloning regimes

For default, historic and hybrid baselines, the entire events queue that includes all simulated events for the entire baseline management event scenario (see section 4.12 of the Determination) must be cloned to cover the 100 year baseline forecast period.

Simulation Type	Steps required
Default baseline	 Follow the above steps to create a plot and the events forming a single clearing interval of 15 years (regeneration, <u>windrow and burn where applicable</u>, management fire where applicable, and clearing). By default, FullCAM will create a new regime for each event added. Highlight each of the existing regimes in the left hand column by holding ctrl on the keyboard and clicking on each regime. Select the 'Edit' button under the Regime Editing header. In the name field type 'baseline', then click 'ok'. This will combine all existing events under one regime.
	 Press the 'Clone' button under the Regime Editing header.
	• Enter '15' for calendar years and for 'number of times', a value high
	enough to clone events over the entirety of the 100-plus year baseline
	period-6- for number of times and click ok.
	queue The last 'initial clearing: no product recovery' event will fall
	beyond the 100-plus year modellingbaseline period and will not need to
	be <u>simulated</u> . These can be left deleted (will appear highlighted in the
	event queue as they will not affect the simulationgrey).
	• Click on it to select it, and then press the 'Delete' button under the
	Event Editing header and click 'yes'.

47

Historic baseline	 Follow the above steps to create a plot and the events forming the two clearing intervals of the durations supported by historical evidence. Highlight each of the existing regimes in the left hand column by holding ctrl on the keyboard and clicking on each regime. Select the 'Edit' button under the Regime Editing header. In the name field type 'baseline', then click 'ok'. This will combine all existing events under one regime. Calculate the number of years between the first event of the first interval and the last event of the second interval. Add 1 to this number. Ie. years between initial regeneration event modelled and the last clearing event modelled plus 1. Press the 'Clone' button under the Regime Editing header. Enter the number calculated above for 'calendar years' and '10' for 'number of times', a value high (or at least enough to clone events over the entirety of the a-100-plus year baseline period-years) and click 'ok'. AnyThe events that are highlighted grey towards the bottom of the events queue fall beyond the 100-plus year modelling period and will not be simulated. These can be left in the event queue as they will not affect the simulation. Follow the above steps to create a plot and the events forming the first 	
	 clearing interval of 15 years, and the second clearing interval of the duration supported by historical evidence. By default, FullCAM will create a new regime for each event added. Highlight each of the existing regimes in the left hand column by holding ctrl on the keyboard and clicking on each regime. Select the 'Edit' button under the Regime Editing header. In the name field type 'baseline', then click 'ok'. This will combine all existing events under one regime. Calculate the number of years between the first event of the first interval and the last event of the second interval. Add 1 to this number. le. years between initial regeneration event modelled and last clearing event plus 1. Press the 'Clone' button under the Regime Editing header. 	
	• Press the clone button under the Regime Editing header.	
	 Enter the number calculated above for 'calendar years' and '10' for 'number of times', <u>a value high (or at least</u> enough to clone events over the entirety of the a-100-plus year baseline period-years) and click 'ok'. <u>AnyThe</u> events that are highlighted grey towards the bottom of the events queue fall beyond the 100-plus year modelling period and will not be simulated. These can be left in the event queue as they will not affect the simulation. 	• • • • • • • • • • • • • • • • • • •
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in 2030	1 Jan 2022	Management Fire			
Baseline	1 Jan 2029	Initial clearing: no	product recovery		
	5.lan 2030	Plant trees: Mixed	d species environmental planting		
~ 12 months	5 Jan 2037	Management Fire			
n 2045	5 Jan 2044	Initial clearing: no	product recovery		
baseline	5 Jan 2045	Plant trace: Mixed	noitacla letromanium aciana		
~ 12 months	5 Jan 2052	Management Fire	species environmental planting		
in 2060	5 Jan 2059	Initial clearing: no	product recovery		
Baseline	5 1 0000	Di			
2 40 minutes	5 Jan 2060	Plant trees: Mixed	species environmental planting		
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Baseline	J Jan 2074	muar cleaning; no	product recovery		
	5 Jan 2075	Plant trees: Mixed	d species environmental planting		
~ 12 months	5 Jan 2082	Management Fire			
in 2090	5 Jan 2089	Initial clearing: no	product recovery		
Baseline	5 Jan 2090	Plant trees: Mixed	d species environmental planting		
~ 12 months	5 Jan 2097	Management Fire			
in 2105	5 Jan 2104	Initial clearing: no	product recovery		
Baseline	5 Jan 2105	Plant trees: Mixed	species environmental planting		
	5 Jan 2112	Management Fire			
	5 Jan 2119	Initial clearing: no	product recovery		

3.11 The Output Tab

Simulation	Steps required		
Туре			
C100_5%	 Double click on 'Output1' listed in the Output Window. 	-	Formatted: List Bullet
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baseline			
Hybrid baseline	 Selected outputs have a tick next to their entry, and on the folder(s) where 		
Project carbon	they are located. Unselect all items so that the text reads '0 outputs selected'.		
C100_5%	Select the tree carbon pools: Carbon / Forest / Plants / C mass of trees.	-	Formatted: List Bullet
C10	•Click 'OK'.		
Default baseline	 Select the tree carbon pools: Carbon / Forest / Plants / C mass of trees. 	-	Formatted: List Bullet
Hybrid baseline	•Select the debris carbon pools: Carbon / Forest / Plants / C mass of debris.		
Historic	Click 'OK'.		
baseline			
Project carbon	 Select the tree carbon pools: Carbon / Forest / Plants / C mass of trees. 	•	Formatted: List Bullet
	 Select the debris carbon pools: Carbon / Forest / Debris / C mass of forest debris. 		
	 Select the CH₄ emissions from fire: Carbon / Whole / Emissions / CH4 emitted due to fire. 		
	•Click 'OK'.		

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Sile Running Sinnandrons

To run the simulation, press the icon in the top menu bar:

3.13 Viewing outputs

<u>Outputs</u> can be viewed by clicking the icon (circled) at the top of the Output window as either:

1.<u>29.</u> Graph

FullCAM_testing_Sep2016_NFMR1.plo - Output 1	
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● FullCAM_testing_Sep2016_NFMR1.plo - Output 1

3.14 Transferring outputs into a spreadsheet

To transfer data into a Microsoft Excel or equivalent spreadsheet for analysis:

Copy all the output data by clicking on the icon (circled) in the top of the Output window.

Open Microsoft Excel (or equivalent spreadsheet software), and 'Paste' the data copied from FullCAM into the spreadsheet. For example:

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4. FullCAM simulations and offsets reporting

Project proponents must calculate the project net abatement by completing the equations in sections 4.21 to 4.29 of the Determination. Parameters generated in FullCAM are used in Equations in the Determination.

Note that for some of the equations the average of the FullCAM output over the simulation period will be required, whereas for others the value of the FullCAM output at the end of the simulation period will be used. Refer to the equations within the Determination to determine which value to use. Averages can be calculated using the average function within your spreadsheet software.

 Table 7: FullCAM outputs and Corresponding Parameters as defined in the Determination

FullCAM Output	Parameter as defined in the Determination	Scenario	Equation in the determination
C mass of debris	CD _{CEA,i}	Project	3
	BCD _{CEA,i,k}	Baseline	4
C mass of trees	CT _{CEA,i}	Project	3
	BCT _{CEA,i,k}	Baseline	4

58

CH ₄ emitted from debris due to fire	E _{CH4} ,i	Project	7
N_2O emitted due to fire	E _{N2} 0,i	Project	8

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Emissions Reduction Assurance Committee review of the native forest from managed regrowth and human-induced regeneration methods

The Emissions Reduction Assurance Committee is reviewing the native forest from managed regrowth and human-induced regeneration methods against the offsets integrity standards in the *Carbon Credits (Carbon Farming Initiative) Act 2011* (CFI Act).

The Committee has identified a pressing concern in relation to whether the methods ensure the rate of crediting of carbon abatement appropriately reflects actual abatement through growth of regenerating forests.

The Committee believes there needs to be a mechanism that complements the Clean Energy Regulator's guidance to provide greater assurance that crediting aligns with onground progress of regenerating vegetation towards forest cover. The Committee considers that without such a mechanism, the methods could allow some projects to be issued Australian Carbon Credit Units in excess of actual increases in carbon storage. The Committee's assessment is that such a mechanism is necessary to ensure the methods meet the requirement in the offsets integrity standards for methods to apply conservative estimates, projections and assumptions.

The Committee's findings have been informed by expectations of achieving forest cover within a certain period of time, based on available science. The Committee's concerns around achieving forest cover have also been informed by assessment of data on land within existing projects.















HIR and NFMR data regarding proposed rule amendment

4 July 2018



Table 2. Historic classification of vegetation status of land (at 1972, 1989, 2010 and 2016) within carbon estimation areas (CEAs) of 85 HIR and NFMR projects

Classification	Hectares
Forest at some stage	355,486
Sparse, but not forest	322,664
Neither sparse nor forest	379,833
Total	1,057,983

Source: National Inventory Forest Monitoring Programme forest mapping layers at 25m² resolution, Australian Government, 2017.

Table 3. Average time between detection of forest loss and regrowth (forest cover attainment)for 1990-2016 for inventory tiles SG55 and SH55 covering Western NSW and Southern QLD

Years	Time between forest loss and regrowth (average)	Notes
1990 to 2007	7 years	
2008 to 2016	12 years	Longer time is this period potentially due to millennial drought prolonging time taken for land deforested in early 2000s to regenerate.

1990 to 2016	9 years	

Source: National Inventory Forest Monitoring Programme data on detection of forest loss and regrowth within FullCAM spatial modelling, Australian Government, 2018.

Figure 1. Relationship between above and below ground live tree biomass (tonnes per hectare dry weight equivalent), canopy cover (as percentage) and height (metres) for 110 sites in southern and central Queensland including brigalow (open circles), mulga (triangles) and poplar box (crosses)



Source: Don Butler, unpublished work using Biomass Plot Library data (accessible at http://data.auscover.org.au/xwiki/bin/view/Product+pages/Biomass+Plot+Library), 2018.

- This figure incorporates data from brigalow (71 sites), mulga (30 sites) and poplar box (9 sites).
- The entire dataset doesn't suggest significant differences among dominant species in terms of the relationship between stand biomass, height and cover.

Figure 2. Relationship between live tree biomass (above and below ground tonnes per hectare dry weight equivalent) and canopy cover for 3 subset height classes



Source: Don Butler, unpublished work using Biomass Plot Library data (accessible at http://data.auscover.org.au/xwiki/bin/view/Product+pages/Biomass+Plot+Library), 2018.

- Statistical modelling of live tree biomass versus height and canopy cover for three subset height classes suggests that regrowth 2.5 metres tall and providing 25 percent canopy cover (i.e. generous view of the forest cover threshold) would rarely be expected to exceed 5.2 tonnes per hectare of live tree biomass (silver highlight shows upper confidence interval for model fit).
- 5.2 tonnes per hectare of live tree biomass translates to 3.6 tonnes of carbon per hectare in the FullCAM trees and debris pools (5.2 tonnes of biomass per hectare figure multiplied by 0.49 to convert biomass to carbon, and then multiplied by 1.43 to convert tree carbon to tree and debris carbon based on FullCAM ratios).





Source: 2016 Public Release of FullCAM using standard parameters for modelling a regeneration event beginning in 2000 (year 0) as per the HIR or NFMR FullCAM Guidelines. Locations modelled informed by information on actual project locations.




Source: FullCAM estimates of carbon abatement in a typical ERF regeneration project area, using modelling parameters required under the HIR method, and comparing with modelling parameters used by the National Inventory Forest Monitoring Programme (modelling regeneration as five years old upon detection of change to forest cover; modelling of sparse vegetation at accumulation rate of 0.25 tonnes carbon per hectare for up to 20 years).



Relating canopy cover and average height to the biomass of the stand

John Larmour, Micah Davies, Keryn Paul, Jacqui England, Stephen Roxburgh

August 2018

Report prepared for the Department of the Environment and Energy



Citation

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1 Background

1.1 Objectives

The aim of this study was to explore the relationship between the above-ground biomass of a stand of woody vegetation and the canopy cover in semi-arid regions of Australia. The specific objective was to develop individual tree- or shrub-based relationships between stem diameter and crown area that could then be applied to plot-based inventories of stem diameter to derive crown areas and scale-up to stand-based estimates of crown cover. The focus of the new field work was on providing additional datasets to build confidence that the relationships derived using existing datasets are more broadly applicable.

2 Methods

2.1 Individual-level measurements of shrub and tree stem diameter and crown area

We identified existing datasets of 1,677 individual shrubs, multi-stemmed trees or single-stemmed trees where stem diameter and crown area were measured in semi-arid regions of Western Australia (WA), New South Wales (NSW) and Queensland (Qld) (Table 1). Just over half of these measurements (59%) were taken especially for this study from locations near Bourke and Charleville (Fig. 1).

Plant Functional Type & Genus	Region	N
Shrubs		
Atriplex spp.	Near Canna, Central West, WA	54
Rhagodia spp.	Near Canna, Central West, WA	52
Melaleuca spp.	Near Canna, Central West, WA	47
Acacia tree spp. ²	Near Canna, Central West, WA	124
Melaleuca spp.	Near Ravensthorpe, South-West WA	40
Dodonaea spp.	Near Cobar, W NSW	46
Eremophila sturtii (turpentine bush)	Near Cobar, W NSW	50
Dodonaea viscosa	SW of Bourke, NSW	195
Eremophila sturtii	SW of Bourke, NSW	106
Multi		
Acacia shrub spp. ¹	Near Canna, Central West, WA	124
Eucalyptus horistes (mallee)	Near Canna, Central West, WA	152
Acacia aneura (mulga)	Near Bourke, W NSW	198
Acacia aneura (mulga)	Near Charleville, Qld	54
Trees		
Allocasuarina cristata	Near Bourke, W NSW	47
Flindersia maculosa	Near Bourke, W NSW	27
<i>Eucalyptus populnea</i> (poplar box)	Near Bourke, W NSW	39
Corymbia intermedia	Near Charleville, Qld	42
Corymbia tessellaris	Near Charleville, Qld	58
Callitris glaucophylla	Near Charleville, Qld	57
Eucalyptus melanoploia	Near Charleville, Qld	47
Eucalyptus coolabah	Near Charleville, Qld	57
<i>Eucalyptus populnea</i> (poplar box)	Near Charleville, Qld	61
Total		1,677

Table 1: Type and number of shrubs and trees that were measured for both stem diameter and crown area within semi-arid regions of Australia.

¹A. acuminata, A. saligna

²A. hemiteles, A. murrayana, A. victoriae



Figure 1: Examples of some of the individuals measured for stem diameter and crown area: a) & b) shrub-dominated plots measured at Bourke; c) & d) tree-form species from Bourke region.

For all 1,677 individuals measured, crown area was calculated as pi times half the crown length (diameter) measured in an East-West orientation, and times half the crown length measured in a North-South orientation. The stem diameter was measured at 10 cm height above the ground (*D10*). Given all of the shrubs and trees measured were from semi-arid regions of Australia, most of the individuals measured were multi-stemmed (Fig. 2). All measurements of multi-stemmed individuals (D_i) were converted to a single value (equivalent stem diameter, $D_e = \sqrt{\sum} D_i^2$, cm), such that the total basal area (cm²) for all stems was equal to the basal area of an individual with this equivalent single diameter.



Figure 2: Examples of multi-stemmed individuals measured for stem diameter.

These datasets were used to determine if there was a generic relationship between D10 and crown area across all datasets, as well as across only datasets where D10 < 30 cm given this subset of data better represented smaller regenerating individuals. We also used ANCOVA analysis to assess whether this relationship was dependent on the plant functional type; namely whether the individual was a shrub, multi-stemmed tree, or single-stemmed tree.

2.2 Individual-level measurements of shrub and tree stem diameter and height

Empirical relationships that relate height to stem diameter of key plant functional types in Australia have been reported previously by Paul et al. (2016; see Table S2 of Supplementary Material). Here we used the same dataset of Paul et al. (2016) and derived relationships for shrubs, multi-stemmed trees (namely multi-stemmed acacias and mallees) and single-stemmed trees excluding relatively large (D10 > 30 cm) individuals from the analysis. For all plant functional types, heights were related to the stem diameter measured at 10 cm above the ground. A further 738 and 142 individuals with D10 > 30 cm were also included in the dataset from the recent survey at Bourke and Charleville, respectively. Therefore the total dataset included 2,800 shrubs, 3,493 multi-stemmed trees, and 2,994 single-stemmed trees. These datasets were used to determine if there was a generic relationship between D10 and height of an individual shrub, multi-stemmed tree or single-stemmed tree.

2.3 Stand-level estimates of biomass, canopy cover and height

Plot-based surveys of woody biomass traditionally use plot- or transect-based inventories of stem diameter. These inventory datasets are then used to estimate woody biomass through the application of allometric relationships for above-ground biomass (Paul et al. 2016) and below-ground biomass (Paul et al. 2018). Using the diameter-based relationship for prediction of crown area (Section 2.1) or height (Section 2.2), these same inventories may also be utilised to provide corresponding estimates of stand-based canopy cover and stand-based estimates of average height of the woody vegetation.

Here we collated plot-based inventories of stem diameter from 790 existing datasets, the primary focus being semi-arid regions of Australia (Table 2). To be included in the data analysis the inventory datasets were required to meet the following criteria:

- 1. Estimated total (above-ground and below-ground) biomass carbon, TBC <10 t C ha⁻¹;
- 2. Plot size > 0.04 ha, and;
- 3. >10 individuals measured per plot.

As outlined in Table 2, there were three types of stands assessed:

- 1. Natural regeneration, where remnant trees within the measured plots were excluded from the analysis (Fig. 3);
- 2. Environmental plantings, where remnant trees within the measured plots were excluded from the analysis (Fig. 4), and;
- 3. Other native vegetation (Fig. 5).

The latter group generally included sites where the management history was not well known, and/or where it was difficult to distinguish the remnant vegetation from that which has been recently regenerated. A total of 14 new plots were measured in the Bourke region for individual canopy areas, heights and stem diameters of trees/shrubs. This region of western NSW typically has large areas dominated by shrubs (hop and turpentine bush) with limited natural regeneration of trees, typically as a consequence of competition from shrubs and high levels of grazing pressure from feral goats. Based on the types of stands available, it was necessary to modify the plot measurement methodology in order to measure enough individual trees for

crown area and height. Thus only five of the 14 plots were included in the dataset for stand-level estimates; the other plots did not meet the criteria above of having a TBC < 10 t C ha⁻¹.

plantings or other native vegetation in semi-arid areas of Australia. NBL refers to the National					
Type of stand	Source	Ν			
Natural regeneration					
Canegrass and Wallal sites, near Charleville	CSIRO	209			
Curra and Meadows sites, near Cobar	CSIRO	16			
Conservation areas, near Bourke	CSIRO	5			
Gidgee sites	NBL	2			
Mulga sites	NBL	108			
Environmental plantings					
22 sites, SE Australia	CSIRO	47			
9 sites, Central West, WA	CSIRO	326			
Other native vegetation					
9 studies	NBL	63			
9 studies	CSIRO	103			
Total		879			

 Table 2: Number of stem-diameter inventory plots (N) collated from stands under regeneration, environmental plantings or other native vegetation in semi-arid areas of Australia. NBL refers to the National Biomass Library.

The datasets in Table 2 were used to explore whether there was a relationship between stand-average height and stand-average TBC, and whether this relationship differed between the three types of stands. Similarly, the collated datasets were used to explore whether there was a relationship between stand-average woody canopy cover and the stand-average TBC, and whether this relationship differed between stand types.

Stand-average TBC (t C ha⁻¹) was calculated as the sum of the above- and below-ground biomass of all individuals in the plot, multiplied by 0.5, and divided by the area of the plot. Stand-average woody canopy cover (m² m⁻²) was calculated by summing the crown areas of all individuals within the plots and dividing this total crown area by the area of the plot.

The 14 plots measured at Bourke were the only stands where both measured and predicted canopy cover and average height were available. Therefore these plots provided a test of how well predictions of canopy cover and average height matched that observed.



Figure 3: Example of natural regeneration stands where inventories of stem diameter were undertaken.



Figure 4: Example of environmental planting stands where inventories of stem diameter were undertaken.



Figure 5: Example of 'other native vegetation' where inventories of stem diameter were undertaken.

3 Results and Discussion

3.1 Relationship between stem diameter and crown area of individuals

The empirical relationship between stem diameter (*D10*) and crown area of individual shrubs and trees (see Section 2.1) was best described by a power relationship (Canopy area = $0.0807D_{10}^{1.7626}$), with an R² of 0.867 and RMSE of 19.9 (*N* = 1,677) (Fig. 6). This relationship appeared to be generic, with no indication that it differed between shrubs and trees. However for this study, our interest was mostly in the smaller regenerating individuals with D₁₀ < 30 cm. For these individuals, the best power relationship describing this smaller subset of data (Canopy area = $0.1699D_{10}^{1.5161}$; *N* = 1,387) gave and R² of 0.663 and RMSE of 4.9 (Fig. 6).



Stem diameter at 10 cm height (cm)

Figure 6: Relationship between stem diameter and the canopy area of an individual shrub or tree (N = 1,677). Datasets used are given in Table 1.

3.2 Relationship between stem diameter and height of individuals

The individual shrub and tree datasets compiled by Paul et al. (2016) and the additional data from Bourke were used to determine an empirical relationship between stem diameter (*D10*) and height as described in Section 2.2. A power relationship could be fitted to the dataset, but with the relationship clearly differing between trees and shrubs (Fig. 7). The power relationship for single-stemmed trees had an R^2 of 0.7496 (*N* =

2,994), for multi-stemmed trees had an R^2 of 0.5916 (N = 3,493), while for shrubs the relationship had an R^2 of 0.6862 (N = 2,800).



Figure 7: Relationship between stem diameter and the height of an individual shrub, single- or multi-stemmed tree. Datasets used are from Paul et al. (2016) and the new data from Bourke, and excluded shrubs and trees of relatively large size (*D10* >30 cm).

3.3 Relationship between stand-level above-ground biomass and canopy cover

Although there was large variation between plots, there was nevertheless a clear relationship between TBC and the crown cover of a stand. A power relationship could be fitted to these datasets, with an R² of 0.8269 (N = 892) (Fig. 8). This relationship appeared to be generic, with no clear indication that it differed between the different types of stands. However, there was a large amount of prediction error for 'Other native vegetation', probably due to variation in remnant trees included within their inventory assessments. For environmental plantings, these TBC-crown relationships are anticipated to vary largely based on the configuration in which the shrubs and trees are established, e.g. rows with wide inter-row spaces cf. dense block plantings. Of most interest is the TBC-crown relationship for stands of natural regeneration. For datasets from stands of natural regeneration, the power relationship could be fitted with an R² of 0.7865 (N = 349) (Fig. 8).



Figure 8: Relationship between the above- and below-ground total biomass carbon (TBC) and woody canopy cover of a stand (m² m⁻²) in moderate-low rainfall and semi-arid regions of Australia. Datasets used are given in Table 2.

3.4 Relationship between stand-level above-ground biomass and average height

The stand-level relationship between TBC and average height was relatively poor (Fig. 9). This was particularly the case for 'Other native vegetation' where not all remnant trees were excluded from the inventory assessments given the difficulty in distinguishing remnant trees from those regenerating. Indeed a number of 'Other native vegetation' stands with TBC of 4 to 7 t C ha⁻¹ probably contained some remnant trees given their relatively high heights (> 5 m). These same stands also contributed to the relatively high TBC for a given canopy cover of only about 0.05-0.08. See sites circles in red in Fig. 8 and 9.

For regenerating stands, the fitted power relationship had an R^2 of only 0.1596 (Fig. 9), with typical heights of regenerating stands being 1.0 to 5.5 m. However, it appeared that there were still a proportion of regenerating stands that did not attain an average height of 2 m at the 3.85 t C ha⁻¹ of TBC required to reach a canopy cover of 0.2 (Fig. 8).



Figure 9: Relationship between the above-ground biomass (AGB) and average height of a stand in moderate-low rainfall and semi-arid regions of Australia. Datasets used are given in Table 2.

3.5 Comparison of observed versus predicted canopy cover and height

The 14 plots measured at Bourke were the only stands where both measured and predicted canopy cover and average height were available. Therefore these plots provided a test of how well predictions of canopy cover and average height matched that observed. Our results showed that when applying the power relationship shown in Fig. 6, there was negligible bias in prediction of canopy area of individual trees and shrubs measured (Fig. 10a), and hence, there was also negligible bias in the plot-based estimates of canopy cover (Fig. 10c). Similarly, when applying the power relationships shown in Fig. 7, there was negligible bias in prediction of the height of individual trees and shrubs measured (Fig. 10b), and hence, there was also negligible bias in the plot-based estimates of negligible bias in the plot-based estimates of average stand height (Fig. 10d).



Figure 10: For the study sites near Bourke, a comparison between observed and predicted: (a) canopy area of individual trees and shrubs, when applying the power relationship fitted to data shown in Fig. 6; (b) height of individual trees and shrubs measured, when applying the power relationships fitted to data shown in Fig. 7; (c) plot-average canopy cover at the 14 plots measured, when applying the power relationship fitted to data shown in Fig. 6 and accounting for the area of the plots, and (d) plot-average height at the 14 plots measured, when applying the power relationships fitted to data shown in Fig. 7 and accounting for the area of the plots.

4 Conclusions

The relationship between stem diameter and crown area of individual trees and shrubs appears to be robust (R² = 0.83) for the semi-arid woodland and shrubland regions included in this study. Further work is required to test if this relationship holds for different climatic regions. A reasonable relationship between stand-level estimates of canopy cover and above-ground biomass was found, particularly for natural regeneration, although this varied according to the extent to which stands included remnant trees. If this relationship can be validated more broadly, crown areas could be utilised to estimate biomass from aerial surveys, either from detailed plot-based drone surveys or from broad-scale airborne or satellite imagery. Crown areas shown on current imagery and compared to historic images, could be an effective method to estimate changes in biomass over varying time scales. We suggest additional tree crown area studies in a broader range of woodland systems, such as those in the southern tablelands of NSW and south western Queensland, to further test the relationship between crown area and stem diameter.

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CONTACT US

 t 1300 363 400 +61 3 9545 2176
 e enquiries@csiro.au
 w www.csiro.au

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Emissions Reduction Fund:

Proposed amendments to the *Carbon Credits (Carbon Farming Initiative) Rule 2015* relating to native vegetation regeneration projects

Consultation paper

August 2018

Making a submission

The Australian Government invites written submissions from all interested businesses and members of the community on the Emissions Reduction Fund Consultation Paper - Proposed amendments to the *Carbon Credits (Carbon Farming Initiative) Rule 2015* relating to native vegetation regeneration projects.

Submissions are due by 5:00pm AEST, Thursday 13 September 2018. Any submissions received after this date will be considered at the Government's discretion.

Submission guidelines

Where possible, submissions should be sent electronically, preferably in Microsoft Word or other text-based formats, to the email address listed below. Alternatively, submissions may be sent to the postal address below to arrive by 5:00pm AEST on the above due date.

All submissions must include a cover sheet, available at www.environment.gov.au. The submission and coversheet should be provided as separate files if sent electronically.

Submissions can be forwarded to:

Email: ERFforests@environment.gov.au (preferred)

Postal: Forests Section Department of the Environment and Energy GPO Box 787 CANBERRA ACT 2601

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Introduction

The Australian Government is considering amendments to the *Carbon Credits (Carbon Farming Initiative) Rule 2015* (the rule) to:

- ensure the Clean Energy Regulator has the information necessary to assess compliance with requirements in Emissions Reduction Fund methods for native vegetation regeneration projects; and
- provide clarity around the timeframes within which land under regeneration methods must attain forest cover to obtain further carbon credits.

Purpose of the proposed amendments

The proposed rule amendments would clarify the intent of the *Carbon Credits (Carbon Farming Initiative) (Human-Induced Regeneration of a Permanent Even-Aged Native Forest — 1.1) Methodology Determination 2013 (as varied in 2018) (the Human-Induced Regeneration Method) Carbon Credits (Carbon Farming Initiative) (Native Forest from Managed Regrowth) Methodology Determination 2013.*

The method provides opportunities for projects involving changes in land management to regenerate native vegetation to attain forest cover. The amendments are designed to support robust implementation and ongoing integrity of the method over the long term. They would provide assurance that crediting aligns with on-ground progress of regenerating vegetation towards forest cover.

The Clean Energy Regulator is developing guidance on stratification, evidence and records for projects under the method. The proposed rule amendments and the guidance are complementary. For example, the guidance requires that at five-yearly intervals proponents must demonstrate that eligible land with forest potential has made progress towards attaining forest cover. Projects that continue to meet the requirements of the Clean Energy Regulator's guidance would be likely to be on track to meet the requirements of the proposed rule amendments later in their crediting period. For this reason, the proposed rule amendments are being released for consultation alongside the draft guidance.

To provide further clarification, the CFI Mapping Guidelines will also be amended following consultation. The method requires use of the CFI Mapping Guidelines when mapping projects. For consultation purposes, geospatial mapping requirements are included in the Clean Energy Regulator's draft guidance. Relevant mapping requirements will be incorporated in the CFI Mapping Guidelines following consultation.

The Government will take submissions on the draft rule amendments into account in considering whether to adopt the rule amendments and make them into law.

Overview of proposed rule amendments

The proposed amendments to the *Carbon Credits (Carbon Farming Initiative) Rule 2015* are to:

- ensure the Clean Energy Regulator has the information necessary to assess compliance with requirements in Emissions Reduction Fund methods for regeneration projects; and
- provide clarity around the timeframes within which land under regeneration methods must attain forest cover to obtain further carbon credits.

The proposed amendments would apply to the <u>Carbon Credits (Carbon Farming Initiative)</u> (Human-Induced Regeneration of a Permanent Even-Aged Native Forest – 1.1) Methodology Determination 2013 and its variants They would also apply to any projects transferring from this method to the Carbon Credits (Carbon Farming Initiative) (Native Forest from Managed Regrowth) Methodology Determination 2013. Thisese methods provides opportunities for projects involving changes in land management to regenerate native forests. The methods defines land as having forest cover if it has an area of at least 0.2 of a hectare, with trees that are two metres or more in height and which provide crown cover of at least 20% of the land.

Legislative background

Under the *Carbon Credits (Carbon Farming Initiative) Act 2011* (the Act) the issuance of Australian carbon credit units is separate to the declaration of eligible offsets projects and offsets reporting under the applicable methodology determination. After submitting an offsets report, project proponents can submit an application for a certificate of entitlement in respect of the reporting period covered by the offsets report. Under subsection 15(2) of the Act the Regulator cannot issue a certificate of entitlement unless satisfied of a number of requirements. Paragraph 15(2)(h) includes in that list any additional requirements specified in the regulations or legislative rules.

Under the Act, offsets reports must include both information required by the applicable methodology determination and information required by legislative rules.

Proposed rule amendments

Central to the proposed amendments is a requirement for a certificate of entitlement such that where requirements for attaining forest cover are not met, crediting is restricted for the applicable carbon estimation areas (CEAs).

Amendments are also proposed clarifying the information necessary to demonstrate that the forest potential requirements of the methods are being met. They complement guidance to be published by the Clean Energy Regulator setting out information to be provided by proponents at five-year intervals to demonstrate that land within carbon estimation areas continues to have forest potential and has made progress towards attaining forest cover.

Land under existing projects (those registered before 1 July 2018) would be required to attain forest cover by 15 years after the declaration of the project. The proposed amendments would limit crediting after the 15 year period for CEAs that have not substantially reached forest cover. They would have no effect on crediting for CEAs that have reached forest cover within 15 years. Proponents could re-stratify CEAs so that

crediting would only be limited for areas of CEAs that have not substantially reached forest cover.

For projects registered after 1 July 2018 or land added to an existing project after 1 July 2018, the same rule would apply but the 15 year period would have a different starting point. It would be the 15 years after the commencement of the modelling of forest regeneration.

The proposed amendments make allowances for projects affected by disturbances or growth pauses, by allowing for the date of the test to be extended by up to five years for 'eligible growth disruptions'. This supports the principle that regeneration projects should be undertaken on land with existing forest potential that is capable of attaining forest cover. The rule also ensures that the forest attainment date falls no later than five years prior to the end of the crediting period.

The proposed amendments are supported by data on growth of vegetation in regions where regeneration projects may be undertaken, including the time this vegetation generally takes to reach forest cover. The data shows that forest cover would have been attained if the on-ground regrowth corresponded with the modelled regeneration estimates over the periods set out.

Limiting the crediting of projects yet to meet the forest cover requirements would support consistency between modelled abatement estimates and on-ground project performance. The offsets integrity standards under the Act require that methods provide for conservative estimates of abatement.

Provisions are included that would ensure vegetation in low productivity areas is required to attain forest cover within timeframes realistic for those conditions. In particular, modelling undertaken in accordance with the relevant method would need to show the CEA has more than [5]¹ tonnes of carbon per hectare for the forest cover requirement to apply.

¹ The Department of the Environment and Energy will confirm the final value during the consultation period.

Detailed explanation of proposed rule amendments

The legislative text for the proposed rule amendments is presented in blue text.

Strengthened offsets reporting requirements

Sections 70 and 71 of the *Carbon Credits (Carbon Farming Initiative) Rule 2015* are proposed to be amended to specify the information that must be included in offsets reports for demonstrating progress towards forest cover at five-year intervals and the attainment of forest cover once the forest cover assessment date (see below) passes. The information provided would need to take into account any guidelines issued by the Regulator.

Section 70, regarding the information that must be included in offsets reports, would be amended to include the following subsection:

Information for human-induced regeneration NFMR projects

- (3A) The offsets report for a human induced regeneration NFMR project must set out the following information:
 - (a) if:
 - (i) a carbon estimation area has never previously been included in an offsets report for a human induced regeneration NFMR project; or
 - (ii) the Regulator requests, in writing, the following information in relation to a carbon estimation area,

an explanation, for the carbon estimation area, of how pre-existing forest cover has been excluded from the carbon estimation area taking into account any guidelines published by the Regulator on its website for the purpose of this paragraph, as in force from time to time;

Note: In 2018, the Regulator's website was http://www.cleanenergyregulator.gov.au

- (b) if:
 - (i) the offsets report is the first offsets report to be submitted after the end of the 5th, 10th, 15th or 20th year of the human induced regeneration NFMR project's last or only crediting period; or
 - (ii) the offsets report for the human induced regeneration NFMR project must be accompanied by a report of a subsequent audit; or
 - (iii) the offsets report is the first offsets report for a human induced regeneration NFMR project where there has been modelling of forest regeneration or growth for a total of 5 or more years before the start of the project's crediting period,

an explanation, for each carbon estimation area included in the offsets report that has not already attained forest cover:

- (iv) of the progress towards or attainment of forest cover in each such carbon estimation area and evidence supporting that progress or attainment; and
- (v) of how the project mechanism has continued to be implemented in each such carbon estimation area and evidence supporting that continued implementation;

taking into account any guidelines published by the Regulator on its website for the purpose of this paragraph, as in force from time to time;

Note: In 2018, the Regulator's website was http://www.cleanenergyregulator.gov.au if:

- (c) if:
 - (i) the offsets report includes a carbon estimation area that has passed its forest cover assessment date; and

(ii) the information required by this paragraph has not already been included in an offsets report,

an explanation of the evidence that demonstrates whether or not the requirements of subsection 9AA(3) are satisfied in relation to the carbon estimation area, taking into account any guidelines published by the Regulator on its website for the purpose of this paragraph, as in force from time to time;

Note: In 2018, the Regulator's website was http://www.cleanenergyregulator.gov.au

- (d) for each carbon estimation area included in the offsets report:
 - (i) the date that the modelling of forest regeneration commenced; and
 - (ii) the estimated forest cover assessment date; and
 - (iii) details of any eligible growth disruption; and
 - (iv) an explanation of whether forest cover has been obtained; and
 - (v) the total carbon stock at the end of the reporting period, in both tonnes of carbon and tonnes of carbon per hectare, under the modelling undertaken in accordance with the applicable methodology determination for the reporting period; and
 - (vi) any previous assessment by the Regulator of whether the land included in the carbon estimation area had pre-existing forest cover.
- (3B) The Regulator may not make a request under subparagraph (3A)(a)(ii) more than once for the same carbon estimation area.
- (6) In this section:

carbon estimation area has the meaning given by subsection 9AA(7).

eligible growth disruption has the meaning given by subsection 9AA(7).

forest cover assessment date has the meaning given by subsection 9AA(6).

human-induced regeneration NFMR project has the meaning given by subsection 9AA(7).

pre-existing forest cover, for a carbon estimation area, means forest cover that existed:

- (a) if the applicable methodology determination for the reporting period is the *Carbon Credits* (*Carbon Farming Initiative*) (*Native Forest from Managed Regrowth*) *Methodology Determination 2013* or an earlier version of that methodology determination applicable to the project in accordance with sections 125, 126, 127 or 130 of the Act—at the time of the decision to implement the project mechanism (within the meaning of those determinations) in the carbon estimation area;
- (b) if the applicable methodology determination for the reporting period is the Carbon Credits (Carbon Farming Initiative) (Human Induced Regeneration of a Permanent Even Aged Forest 1.1) Methodology Determination 2013 as in force at any time until 21 March 2016 immediately before project commencement (within the meaning of that determination) for the carbon estimation area;
- (c) if the applicable methodology determination for the reporting period is the Carbon Credits (Carbon Farming Initiative) (Human Induced Regeneration of a Permanent Even Aged Forest—1.1) Methodology Determination 2013 as in force at any time after 21 March 2016—at any time during the baseline period (within the meaning of that determination) for the carbon estimation area.

Section 71, regarding documents that must accompany an offsets report, would be amended to include the following paragraph.

(c) if the offsets report for a human induced regeneration NFMR project is required to contain information under subsection 70(3A)—documents to support the information, taking into account any guidelines published by the Regulator on its website for the purpose of this paragraph, as in force from time to time.

Note: In 2018, the Regulator's website was http://www.cleanenergyregulator.gov.au

Eligibility requirements for a certificate of entitlement regarding forest cover attainment

A section 9AA would be introduced to set out eligibility requirements for obtaining a certificate of entitlement applicable when projects have passed their forest cover assessment date and in relation to the information required above. Whether or not this section is satisfied would not affect the declaration of the project, whether the project complies with the applicable methodology determination, any credits already issued for the project or whether a certificate of entitlement will be issued for a subsequent reporting period.

9AA Issue of certificate of entitlement—eligibility requirements for human-induced regeneration NFMR projects

- (1) For paragraph 15(2)(h) of the Act, this section specifies eligibility requirements that must be met in order for a certificate of entitlement to be issued in respect of an eligible offsets project that is a human induced regeneration NFMR project for a reporting period.
 - Note: The fact that these requirements are not met in relation to a reporting period does not mean that they cannot be met in relation to a subsequent reporting period within the crediting period; for example, if at the end of that subsequent reporting period forest cover has been attained.

Subsection (2) would ensure the information requirements set out in subsections 70(3A)(b) and paragraph 71(c) are adequately met in order for a regeneration project to be eligible for a certificate of entitlement.

(2) If the offsets report for the reporting period was required to include information in accordance with paragraph 70(3A)(b)—it is an eligibility requirement that the information provided in the report, and any documents included in accordance with paragraph 71(c) to support such information, are sufficient to enable the Regulator to determine if the forest potential requirement of the applicable methodology determination for the reporting period is satisfied in relation to all carbon estimation areas that are included in the offsets report.

Subsection (3) is the central proposed additional requirement to ensure that all CEAs that are past their forest cover assessment date must have attained forest cover to be eligible for a certificate of entitlement.

- (3) It is an eligibility requirement that all carbon estimation areas that:
 - (a) are included in the offsets report for the reporting period; and
 - (b) are past their forest cover assessment date;

have attained forest cover by or before the end of the reporting period.

- Note 1: Under the applicable methodology determination for the human induced regeneration NFMR project a project proponent may choose to re-stratify the carbon estimation areas to ensure that this requirement is met in relation to a reporting period. Under section 77A of the Act a project proponent may also choose to report on all carbon estimation areas that meet this requirement in advance of any carbon estimation areas which do not meet this requirement.
- Note 2: It is intended that audit reports provided under section 79A or otherwise provided to the Regulator will be used to assist the Regulator to verify this requirement. Under subsection 9(2) if

an audit report does not set out a reasonable assurance conclusion or qualified reasonable assurance conclusion a certificate of entitlement may not be issued.

Subsection (4) would set out what is required for a CEA to be taken to have attained forest cover. The proposed requirements are designed to ensure only those areas of land within a CEA meeting the methods' definition of forest cover can be taken to have attained forest cover. In order to reliably determine whether forests meet the minimum area of 0.2 hectares, the assessment of forest cover must be undertaken at the 0.2 hectare scale. Any land of 0.2 hectares (or more) in area that does not have trees two metres or more in height and providing crown cover of at least 20% of the land does not meet the forest cover definition. Therefore the proposed amendments require assessment at the 0.2 hectare scale.

Paragraph (4)(a) provides for a simplified assessment approach; if the forest cover mapping used by the National Inventory Report to report sequestered carbon shows over 90% of the area of the carbon estimation area as having forest cover, the CEA is taken to have attained forest cover. This approach is permitted because the National Inventory Report forest cover mapping is undertaken at a scale of less than 0.2 hectares (0.0625 ha) and applies the requirement of a minimum contiguous forest area of 0.2 hectares to classify land as having forest cover. Paragraph (4)(b) provides for a more detailed assessment such that when a CEA is considered as 0.2 hectare portions, and over 90% of those 0.2 hectare portions have attained forest cover.

If land were to be credited for abatement where it does not attain forest cover in at least 90% of the 0.2 hectare portions by the forest cover assessment date, the crediting is unlikely to be conservative. This is because the models used for estimating abatement under the methods are calibrated to provide estimates of abatement where each 0.2 hectare portion of land attains forest cover. The proposed requirements would help ensure carbon abatement credited under the regeneration methods is conservative.

Allowing for 90% of 0.2 hectare portions to have attained forest cover, rather than 100%, would reduce the need for re-stratification if a small proportion of a CEA has not attained forest cover. Furthermore, where a small proportion of the CEA (10% or less of the 0.2 hectare portions) may be on the margins of having attained forest cover, the whole of the CEA would not be prevented from being taken to have attained forest cover.

Subsection (5) provides for requirements to be set out in the Carbon Farming Initiative Mapping Guidelines to guide assessment of carbon estimation areas under paragraph (4)(b) and further guidance by the Clean Energy Regulator.

- (4) For the purpose of subsection (3), a carbon estimation area has *attained forest cover* if:
 - (a) over 90% of the area of the carbon estimation area is identified as having forest cover in accordance with the most recent version of the maps that form the basis of the National Inventory Report; or
 - (b) when assessed in 0.2 hectare portions, over 90% of those portions have attained forest cover such that the land in each portion has trees that:
 - (i) are 2 metres or more in height; and
 - (ii) provide crown cover of at least 20% of the land.
 - Note: The fact that a carbon estimation area is considered to have attained forest cover under this subsection does not mean that any requirements relating to forest cover or forest potential under the applicable methodology determination for the project are satisfied.
- (5) The assessment of 0.2 hectare portions for a carbon estimation area under paragraph (4)(b) must:

- (a) comply with any requirements set out in the CFI Mapping Guidelines for the purpose of this paragraph; and
- (b) take into account any guidelines published by the Regulator on its website for the purpose of this paragraph, as in force from time to time.

Note: In 2018, the Regulator's website was http://www.cleanenergyregulator.gov.au.

Subsection (6) would define when a CEA has passed the forest cover assessment date. This occurs once both the tonnes of carbon per hectare amount under paragraph (a) and the time period set out under paragraph (b) or (c) have been surpassed.

Where the time period has been surpassed, but not the tonnes of carbon amount (or vice versa), the forest cover assessment date has not yet passed.

The provision under paragraph (a) ensures land is only required to have attained forest cover once it is reasonable to expect it to have done so. The relationship between tonnes of carbon present in regenerating forest and canopy cover informs this provision. However, it does not apply for the last 5 years of a project's crediting period.

Paragraphs (b) and (c) set-out separate timing for existing CEAs (an area that was part of the project area for a regeneration project on 1 July 2018) and non-existing CEAs (as of 1 July 2018).

For existing CEAs, under paragraph (b), the timing is the later of 15 years after declaration, or 15 years after the commencement of modelling of forest regeneration, disregarding up to 5 years of eligible growth disruption in either case. For this purpose the declaration is the day the Regulator made the decision to declare the project and not when it may have taken effect under earlier provisions in the Act which allowed the backdating of the effect of the declaration.

For non-existing CEAs, under paragraph (c), the timing is 15 years since the modelling of forest regeneration commenced, disregarding up to 5 years of eligible growth disruption.

- (6) A carbon estimation area has passed its *forest cover assessment date*, when paragraph (a) and either paragraph (b) or (c) are satisfied:
 - (a) either:
 - (i) the carbon estimation area contains more than [5] tonnes of carbon per hectare under the modelling undertaken in accordance with the applicable methodology determination for the reporting period for the purpose of preparing the offsets report; or
 - (ii) the carbon estimation area is part of an eligible offset project with less than 5 years of its crediting period remaining;
 - (b) if the carbon estimation area is an existing CEA—the date is after the later of:
 - (i) the date that is 15 years since the day the eligible offsets project first including the area was declared under section 27 of the Act disregarding up to 5 years of any eligible growth disruption; and
 - (ii) the date that is 15 years since the modelling of forest regeneration commenced for the carbon estimation area disregarding up to 5 years of any eligible growth disruption;
 - (c) if the carbon estimation area is not an existing CEA—the date more than 15 years since the modelling of forest regeneration commenced for the carbon estimation area disregarding up to 5 years of any eligible growth disruption.
 - Note 1: The periods of eligible growth disruption need not be at the same time. For example, under paragraph (c) if the third and fifth year after modelling of forest regeneration commenced was an eligible growth disruption the forest cover assessment date would be 17 years after that

modelling commencement (assuming over [5] tonnes of carbon per hectare was present at the end of the reporting period according to the modelling).

Note 2: The modelling of when forest regeneration commences is often described as a regeneration event in the model where carbon stocks begin to increase in the carbon estimation area.

Subsection (7) would provide for further definitions.

(7) In this section:

carbon estimation area, for an eligible offsets projects, has the meaning given by the applicable methodology determination for the reporting period.

The definition for 'eligible growth disruption' would cover any period of time during which carbon stocks decrease or are modelled to be stable, for example due to a growth pause event. An eligible growth disruption would run for the period that the model shows a zero or negative change in abatement from one step to the next, rather than the period of time it takes carbon stocks to recover to previous levels (in the event of a disturbance, for example).

eligible growth disruption, in relation to a period, means any period of time meeting the following criteria:

- (a) occurs after carbon stocks have begun to increase following the modelling of regeneration;
- (b) during which carbon stocks are modelled not to increase under the applicable methodology determination for the reporting period;
- (c) if subparagraph (6)(b)(i) applies—does not include a period before the day the project was declared under section 27 of the Act.

existing CEA means a carbon estimation area consisting only of an area that was part of the project area for a human induced regeneration NFMR project on 1 July 2018.

forest potential requirement means a requirement for an area of land to have forest potential, within the meaning of the applicable methodology determination for the reporting period, for the land to be included in a carbon estimation area for the project.

The definition for 'human-induced regeneration NFMR project' includes projects under the *Carbon Credits (Carbon Farming Initiative) (Human-Induced Regeneration of a Permanent Even-Aged Native Forest — 1.1) Methodology Determination 2013*; and projects under the *Carbon Credits (Carbon Farming Initiative) (Native Forest from Managed Regrowth) Methodology Determination 2013* which have any land that was previously part of a project under the *Credits (Carbon Farming Initiative) (Human-Induced Regeneration of a Permanent Even-Aged Native Forest — 1.1) Methodology Determination 2013*.

human-induced regeneration NFMR project means either:

(a) a project whose applicable methodology determination for the reporting period is the Carbon Credits (Carbon Farming Initiative) (Human Induced Regeneration of a Permanent Even Aged Native Forest 1.1) Methodology Determination 2013 or an earlier version of that determination applicable to the project in accordance with sections 125, 126, 127 or 130 of the Act; or

- (b) a project:
 - (i) whose applicable methodology determination for the reporting period is the Carbon Credits (Carbon Farming Initiative) (Native Forest from Managed Regrowth) Methodology Determination 2013 or an earlier version of that methodology determinations applicable to the project in accordance with sections 125, 126, 127 or 130 of the Act; and

 (ii) whose project area includes land that was previously part of an eligible offsets project covered by the Carbon Credits (Carbon Farming Initiative) (Human-Induced Regeneration of a Permanent Even Aged Native Forest - 1.1) Methodology Determination 2013 or an earlier version of that determination applicable to the project in accordance with sections 125, 126, 127 or 130 of the Act.

National Inventory Report means the report of that name produced by Australia in fulfilment of its obligations under the Climate Change Convention and the Kyoto Protocol, as in force from time to time.

Note: In 2018, the National Inventory Report could be accessed from http://www.environment.gov.au.

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

Supporting auditing requirements

The draft rule amendment provisions introduced in this section set out additional audit requirements relating to forest cover. Projects that have passed the forest cover assessment date would need to be audited. Projects would be exempt from this requirement if a previous audit found that the requirement to attain forest cover (subsection 9AA(3)) has already been satisfied, or where the Regulator agrees in writing that this is unnecessary. One of the reasons why an audit would be unnecessary is where a subsequent audit has been scheduled or rescheduled to cover the relevant period.

79A Forest cover audits of human-induced regeneration NFMR projects

- (1) An eligible offsets project that is a human induced regeneration NFMR project must be audited if:
 - (a) an offsets report for a reporting period will be submitted which includes one or more carbon estimation areas that have past their forest cover assessment date; and
 - (b) a previous audit report:
 - (i) prepared under this Division; or
 - (ii) prepared at the request of the project proponent and conducted in accordance with the requirements of section 80;

has not been provided to the Regulator confirming, by way of a reasonable assurance conclusion or a qualified reasonable assurance conclusion, that the requirements of subsection 9AA(3) are satisfied for each carbon estimation area that is included in the offsets report and has passed its forest cover assessment date.

- (2) However, an audit need not be prepared if the Regulator agrees, in writing, that it is unnecessary.
- (3) The audit must be about whether the requirements of subsection 9AA(3) are satisfied in relation to the reporting period.
- (4) The report of the audit must accompany the offsets report for the reporting period mentioned in paragraph (1)(a).

Section 74 would be amended to include the following subsection to enable audit reports to cover any matter identified by the Regulator on a risk-basis with mutual agreement of the project proponent, similar to paragraph 76(2)(c):

(2A) If requested in writing by the Regulator after agreement between the Regulator and the project proponent, the initial audit must also be about any matter identified by the Regulator in a risk-based assessment of the project.



EMISSIONS REDUCTION ASSURANCE COMMITTEE

Review of the Human-Induced Regeneration and Native Forest from Managed Regrowth methods

Findings and Next Steps

3 December 2018

Overall findings

- With amendments to the CFI Rule, the HIR and NFMR methods comply with the offsets integrity standards
- The methods should be varied to ensure the methods reflect best practice
Additionality

Findings:

- Given the HIR method's dependence on having no forest cover in the baseline period to demonstrate additionality, a 10-year baseline period may not be sufficient
- Complexity of land clearing regulations, particularly in relation to fodder harvesting, makes it difficult to assess whether projects meet the regulatory additionality test

Additionality

Recommendations:

- Vary the HIR method to strengthen evidence requirements and possibly lengthen the baseline period
- Clarify the HIR method to improve the application of the regulatory additionality test

Estimating project abatement

Findings:

- The regeneration methods have over-crediting risks due to inclusion of land that:
 - has pre-existing forest cover
 - lacks forest potential
 - regenerates slower than assumed in FullCAM
- The methods clearly require:
 - the exclusion of land with pre-existing forest cover or that lack forest potential
 - forest to be assessed at a 0.2 ha scale for all relevant purposes
- Clean Energy Regulator guidelines will reduce the risks associated with preexisting forest and forest potential
- CFI Rule amendments reduce forward- and over-crediting risks associated with slow regeneration

Concerns about NFMR

- Some members of ERAC have three concerns about NFMR:
 - the method's additionality requirement for at least one previous clearing event may not be sufficient to support the BAU assumption that land would be periodically cleared
 - scope for crediting of pre-project regeneration potentially excessive and illogical
 - scope for inclusion of fires in baseline scenario potentially too broad
- Position of ERAC on these issues still to be resolved

Estimating project abatement

Recommendations:

- Clarify requirements to assess forest potential and forest cover at 0.2 ha scale
- Clarify that regeneration must be demonstrated at 0.2 hectare scale for all land in a CEA
- Vary the HIR method to establish 5-year gateways similar to those in the CFI Rule and Regulator guidelines
 - Gateways should establish the levels of crown cover or biomass needed for continued crediting
 - Gateways should take into account regional differences in biomass-crown cover relationships (i.e. tailored gateways)
 - Proponents should have option of measuring biomass where biomass-crown cover tests not satisfied

Estimating project abatement

Recommendations:

- Consider developing a simplified version of HIR, using only National Accounts data
 - Method would have biomass-crown cover gateways
 - Look at incorporation of other streamlining options (e.g. around auditing)
 - Use discounts to manage integrity risks
- Consider developing a direct measurement HIR method

Project leakage

Finding:

• Available evidence did not indicate material leakage from projects

Project emissions

Finding:

• Emissions from fuel use are not material

Recommendation:

• Remove requirements to account for emissions from fuel use

Permanence

Findings:

- The permanence period discount for projects with 25-year permanence periods may need to be increased to manage nonpermanence risks
- Allowing projects to transition from 25-year to 100-year permanence period likely to be beneficial

Recommendation:

• Consider increasing the permanence period discount and allowing projects to transition from 25-year to 100-year permanence period

Other matters

Finding:

• There may be better alternatives to the HIR method's 1.5 km radius requirement for CEAs to manage risks associated with heterogeneous rates of regeneration

Recommendation:

 Investigate alternatives to the 1.5 km radius requirement that can lower transaction costs and maintain integrity

Other matters

Finding:

• The way risks associated with method design errors are shared between proponents and the Government could be improved

Recommendation:

 Develop a more robust and sustainable risk-sharing framework for method design errors

Other reform proposals

- Other proposals
 - Develop method (or variation) that allows crediting of increased biomass in woody vegetation in sub-forest ecosystems and pre-existing forests; e.g.
 - regeneration of vegetation with <20% crown cover at maturity
 - increase in biomass in forest systems (i.e. that start with >20% crown cover)
 - Biggest challenge is additionality devising sufficiently robust baselines, particularly in degraded ecosystems + that account for impact of climate variability on growth
 - Allow direct seeding and planting with projects
 - Consider adding requirement for vegetation to be managed so as to ensure it has structure and species mix representative of native vegetation in the region (as per Avoided Deforestation method)
 - Questions regarding allowing fodder harvesting or increased ecological thinning

Next steps

- ERAC meeting on 10 December to consider draft report aim to finalise findings and recommendations
- Report to be released in early 2019 (possibly late Jan but more likely Feb)
- Department to consider review recommendations in early 2019
- Depending on views, Department to commence work on variations in early- to mid-2019 (noting election likely in May)



Relating canopy cover and average height to the biomass of the stand

John Larmour, Micah Davies, Keryn Paul, Jacqui England, Stephen Roxburgh

August 2018

Report prepared for the Department of the Environment and Energy



Citation

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1 Background

1.1 Objectives

The aim of this study was to explore the relationship between the above-ground biomass of a stand of woody vegetation and the canopy cover in semi-arid regions of Australia. The specific objective was to develop individual tree- or shrub-based relationships between stem diameter and crown area that could then be applied to plot-based inventories of stem diameter to derive crown areas and scale-up to stand-based estimates of crown cover. The focus of the new field work was on providing additional datasets to build confidence that the relationships derived using existing datasets are more broadly applicable.

2 Methods

2.1 Individual-level measurements of shrub and tree stem diameter and crown area

We identified existing datasets of 1,677 individual shrubs, multi-stemmed trees or single-stemmed trees where stem diameter and crown area were measured in semi-arid regions of Western Australia (WA), New South Wales (NSW) and Queensland (Qld) (Table 1). Just over half of these measurements (59%) were taken especially for this study from locations near Bourke and Charleville (Fig. 1).

Plant Functional Type & Genus	Region	N
Shrubs		
Atriplex spp.	Near Canna, Central West, WA	54
Rhagodia spp.	Near Canna, Central West, WA	52
Melaleuca spp.	Near Canna, Central West, WA	47
Acacia tree spp. ²	Near Canna, Central West, WA	124
Melaleuca spp.	Near Ravensthorpe, South-West WA	40
Dodonaea spp.	Near Cobar, W NSW	46
Eremophila sturtii (turpentine bush)	Near Cobar, W NSW	50
Dodonaea viscosa	SW of Bourke, NSW	195
Eremophila sturtii	SW of Bourke, NSW	106
Multi		
Acacia shrub spp. ¹	Near Canna, Central West, WA	124
Eucalyptus horistes (mallee)	Near Canna, Central West, WA	152
Acacia aneura (mulga)	Near Bourke, W NSW	198
Acacia aneura (mulga)	Near Charleville, Qld	54
Trees		
Allocasuarina cristata	Near Bourke, W NSW	47
Flindersia maculosa	Near Bourke, W NSW	27
<i>Eucalyptus populnea</i> (poplar box)	Near Bourke, W NSW	39
Corymbia intermedia	Near Charleville, Qld	42
Corymbia tessellaris	Near Charleville, Qld	58
Callitris glaucophylla	Near Charleville, Qld	57
Eucalyptus melanoploia	Near Charleville, Qld	47
Eucalyptus coolabah	Near Charleville, Qld	57
<i>Eucalyptus populnea</i> (poplar box)	Near Charleville, Qld	61
Total		1,677

Table 1: Type and number of shrubs and trees that were measured for both stem diameter and crown area within semi-arid regions of Australia.

¹A. acuminata, A. saligna

²A. hemiteles, A. murrayana, A. victoriae



Figure 1: Examples of some of the individuals measured for stem diameter and crown area: a) & b) shrub-dominated plots measured at Bourke; c) & d) tree-form species from Bourke region.

For all 1,677 individuals measured, crown area was calculated as pi times half the crown length (diameter) measured in an East-West orientation, and times half the crown length measured in a North-South orientation. The stem diameter was measured at 10 cm height above the ground (*D10*). Given all of the shrubs and trees measured were from semi-arid regions of Australia, most of the individuals measured were multi-stemmed (Fig. 2). All measurements of multi-stemmed individuals (D_i) were converted to a single value (equivalent stem diameter, $D_e = \sqrt{\sum} D_i^2$, cm), such that the total basal area (cm²) for all stems was equal to the basal area of an individual with this equivalent single diameter.



Figure 2: Examples of multi-stemmed individuals measured for stem diameter.

These datasets were used to determine if there was a generic relationship between D10 and crown area across all datasets, as well as across only datasets where D10 < 30 cm given this subset of data better represented smaller regenerating individuals. We also used ANCOVA analysis to assess whether this relationship was dependent on the plant functional type; namely whether the individual was a shrub, multi-stemmed tree, or single-stemmed tree.

2.2 Individual-level measurements of shrub and tree stem diameter and height

Empirical relationships that relate height to stem diameter of key plant functional types in Australia have been reported previously by Paul et al. (2016; see Table S2 of Supplementary Material). Here we used the same dataset of Paul et al. (2016) and derived relationships for shrubs, multi-stemmed trees (namely multi-stemmed acacias and mallees) and single-stemmed trees excluding relatively large (D10 > 30 cm) individuals from the analysis. For all plant functional types, heights were related to the stem diameter measured at 10 cm above the ground. A further 738 and 142 individuals with D10 > 30 cm were also included in the dataset from the recent survey at Bourke and Charleville, respectively. Therefore the total dataset included 2,800 shrubs, 3,493 multi-stemmed trees, and 2,994 single-stemmed trees. These datasets were used to determine if there was a generic relationship between D10 and height of an individual shrub, multi-stemmed tree or single-stemmed tree.

2.3 Stand-level estimates of biomass, canopy cover and height

Plot-based surveys of woody biomass traditionally use plot- or transect-based inventories of stem diameter. These inventory datasets are then used to estimate woody biomass through the application of allometric relationships for above-ground biomass (Paul et al. 2016) and below-ground biomass (Paul et al. 2018). Using the diameter-based relationship for prediction of crown area (Section 2.1) or height (Section 2.2), these same inventories may also be utilised to provide corresponding estimates of stand-based canopy cover and stand-based estimates of average height of the woody vegetation.

Here we collated plot-based inventories of stem diameter from 790 existing datasets, the primary focus being semi-arid regions of Australia (Table 2). To be included in the data analysis the inventory datasets were required to meet the following criteria:

- 1. Estimated total (above-ground and below-ground) biomass carbon, TBC <10 t C ha⁻¹;
- 2. Plot size > 0.04 ha, and;
- 3. >10 individuals measured per plot.

As outlined in Table 2, there were three types of stands assessed:

- 1. Natural regeneration, where remnant trees within the measured plots were excluded from the analysis (Fig. 3);
- 2. Environmental plantings, where remnant trees within the measured plots were excluded from the analysis (Fig. 4), and;
- 3. Other native vegetation (Fig. 5).

The latter group generally included sites where the management history was not well known, and/or where it was difficult to distinguish the remnant vegetation from that which has been recently regenerated. A total of 14 new plots were measured in the Bourke region for individual canopy areas, heights and stem diameters of trees/shrubs. This region of western NSW typically has large areas dominated by shrubs (hop and turpentine bush) with limited natural regeneration of trees, typically as a consequence of competition from shrubs and high levels of grazing pressure from feral goats. Based on the types of stands available, it was necessary to modify the plot measurement methodology in order to measure enough individual trees for

crown area and height. Thus only five of the 14 plots were included in the dataset for stand-level estimates; the other plots did not meet the criteria above of having a TBC < 10 t C ha⁻¹.

plantings of other native vegetation in semi-arid areas of Australia. NBL refers to the National					
Type of stand	Source	Ν			
Natural regeneration					
Canegrass and Wallal sites, near Charleville	CSIRO	209			
Curra and Meadows sites, near Cobar	CSIRO	16			
Conservation areas, near Bourke	CSIRO	5			
Gidgee sites	NBL	2			
Mulga sites	NBL	108			
Environmental plantings					
22 sites, SE Australia	CSIRO	47			
9 sites, Central West, WA	CSIRO	326			
Other native vegetation					
9 studies	NBL	63			
9 studies	CSIRO	103			
Total		879			

 Table 2: Number of stem-diameter inventory plots (N) collated from stands under regeneration, environmental plantings or other native vegetation in semi-arid areas of Australia. NBL refers to the National Biomass Library.

The datasets in Table 2 were used to explore whether there was a relationship between stand-average height and stand-average TBC, and whether this relationship differed between the three types of stands. Similarly, the collated datasets were used to explore whether there was a relationship between stand-average woody canopy cover and the stand-average TBC, and whether this relationship differed between stand types.

Stand-average TBC (t C ha⁻¹) was calculated as the sum of the above- and below-ground biomass of all individuals in the plot, multiplied by 0.5, and divided by the area of the plot. Stand-average woody canopy cover (m² m⁻²) was calculated by summing the crown areas of all individuals within the plots and dividing this total crown area by the area of the plot.

The 14 plots measured at Bourke were the only stands where both measured and predicted canopy cover and average height were available. Therefore these plots provided a test of how well predictions of canopy cover and average height matched that observed.



Figure 3: Example of natural regeneration stands where inventories of stem diameter were undertaken.



Figure 4: Example of environmental planting stands where inventories of stem diameter were undertaken.



Figure 5: Example of 'other native vegetation' where inventories of stem diameter were undertaken.

3 Results and Discussion

3.1 Relationship between stem diameter and crown area of individuals

The empirical relationship between stem diameter (*D10*) and crown area of individual shrubs and trees (see Section 2.1) was best described by a power relationship (Canopy area = $0.0807D_{10}^{1.7626}$), with an R² of 0.867 and RMSE of 19.9 (*N* = 1,677) (Fig. 6). This relationship appeared to be generic, with no indication that it differed between shrubs and trees. However for this study, our interest was mostly in the smaller regenerating individuals with D₁₀ < 30 cm. For these individuals, the best power relationship describing this smaller subset of data (Canopy area = $0.1699D_{10}^{1.5161}$; *N* = 1,387) gave and R² of 0.663 and RMSE of 4.9 (Fig. 6).



Stem diameter at 10 cm height (cm)

Figure 6: Relationship between stem diameter and the canopy area of an individual shrub or tree (N = 1,677). Datasets used are given in Table 1.

3.2 Relationship between stem diameter and height of individuals

The individual shrub and tree datasets compiled by Paul et al. (2016) and the additional data from Bourke were used to determine an empirical relationship between stem diameter (*D10*) and height as described in Section 2.2. A power relationship could be fitted to the dataset, but with the relationship clearly differing between trees and shrubs (Fig. 7). The power relationship for single-stemmed trees had an R^2 of 0.7496 (*N* =

2,994), for multi-stemmed trees had an R^2 of 0.5916 (N = 3,493), while for shrubs the relationship had an R^2 of 0.6862 (N = 2,800).



Figure 7: Relationship between stem diameter and the height of an individual shrub, single- or multi-stemmed tree. Datasets used are from Paul et al. (2016) and the new data from Bourke, and excluded shrubs and trees of relatively large size (*D10* >30 cm).

3.3 Relationship between stand-level above-ground biomass and canopy cover

Although there was large variation between plots, there was nevertheless a clear relationship between TBC and the crown cover of a stand. A power relationship could be fitted to these datasets, with an R² of 0.8269 (N = 892) (Fig. 8). This relationship appeared to be generic, with no clear indication that it differed between the different types of stands. However, there was a large amount of prediction error for 'Other native vegetation', probably due to variation in remnant trees included within their inventory assessments. For environmental plantings, these TBC-crown relationships are anticipated to vary largely based on the configuration in which the shrubs and trees are established, e.g. rows with wide inter-row spaces cf. dense block plantings. Of most interest is the TBC-crown relationship for stands of natural regeneration. For datasets from stands of natural regeneration, the power relationship could be fitted with an R² of 0.7865 (N = 349) (Fig. 8).



Figure 8: Relationship between the above- and below-ground total biomass carbon (TBC) and woody canopy cover of a stand (m² m⁻²) in moderate-low rainfall and semi-arid regions of Australia. Datasets used are given in Table 2.

3.4 Relationship between stand-level above-ground biomass and average height

The stand-level relationship between TBC and average height was relatively poor (Fig. 9). This was particularly the case for 'Other native vegetation' where not all remnant trees were excluded from the inventory assessments given the difficulty in distinguishing remnant trees from those regenerating. Indeed a number of 'Other native vegetation' stands with TBC of 4 to 7 t C ha⁻¹ probably contained some remnant trees given their relatively high heights (> 5 m). These same stands also contributed to the relatively high TBC for a given canopy cover of only about 0.05-0.08. See sites circles in red in Fig. 8 and 9.

For regenerating stands, the fitted power relationship had an R^2 of only 0.1596 (Fig. 9), with typical heights of regenerating stands being 1.0 to 5.5 m. However, it appeared that there were still a proportion of regenerating stands that did not attain an average height of 2 m at the 3.85 t C ha⁻¹ of TBC required to reach a canopy cover of 0.2 (Fig. 8).



Figure 9: Relationship between the above-ground biomass (AGB) and average height of a stand in moderate-low rainfall and semi-arid regions of Australia. Datasets used are given in Table 2.

3.5 Comparison of observed versus predicted canopy cover and height

The 14 plots measured at Bourke were the only stands where both measured and predicted canopy cover and average height were available. Therefore these plots provided a test of how well predictions of canopy cover and average height matched that observed. Our results showed that when applying the power relationship shown in Fig. 6, there was negligible bias in prediction of canopy area of individual trees and shrubs measured (Fig. 10a), and hence, there was also negligible bias in the plot-based estimates of canopy cover (Fig. 10c). Similarly, when applying the power relationships shown in Fig. 7, there was negligible bias in prediction of the height of individual trees and shrubs measured (Fig. 10b), and hence, there was also negligible bias in the plot-based estimates of negligible bias in the plot-based estimates of average stand height (Fig. 10d).



Figure 10: For the study sites near Bourke, a comparison between observed and predicted: (a) canopy area of individual trees and shrubs, when applying the power relationship fitted to data shown in Fig. 6; (b) height of individual trees and shrubs measured, when applying the power relationships fitted to data shown in Fig. 7; (c) plot-average canopy cover at the 14 plots measured, when applying the power relationship fitted to data shown in Fig. 6 and accounting for the area of the plots, and (d) plot-average height at the 14 plots measured, when applying the power relationships fitted to data shown in Fig. 7 and accounting for the area of the plots.

4 Conclusions

The relationship between stem diameter and crown area of individual trees and shrubs appears to be robust (R² = 0.83) for the semi-arid woodland and shrubland regions included in this study. Further work is required to test if this relationship holds for different climatic regions. A reasonable relationship between stand-level estimates of canopy cover and above-ground biomass was found, particularly for natural regeneration, although this varied according to the extent to which stands included remnant trees. If this relationship can be validated more broadly, crown areas could be utilised to estimate biomass from aerial surveys, either from detailed plot-based drone surveys or from broad-scale airborne or satellite imagery. Crown areas shown on current imagery and compared to historic images, could be an effective method to estimate changes in biomass over varying time scales. We suggest additional tree crown area studies in a broader range of woodland systems, such as those in the southern tablelands of NSW and south western Queensland, to further test the relationship between crown area and stem diameter.

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CONTACT US

 t 1300 363 400 +61 3 9545 2176
 e enquiries@csiro.au
 w www.csiro.au

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Proposed amendments to the *Carbon Credits (Carbon Farming Initiative) Rule* 2015 affecting native vegetation regeneration projects

The following proposed amendments (blue text) to the rule:

- extend coverage of provisions requiring attainment of forest cover within a specified period to continue to obtain certificates of entitlement, to apply to projects under the Native Forest from Managed Regrowth method in addition to existing applicability to projects under the Human-Induced Regeneration method
- ensure that where regeneration projects are stratified in accordance with the Clean Energy Regulator's *Guidelines on stratification, evidence and records for projects under the Human-Induced Regeneration of a Permanent Even-Aged Native Forest and Native Forest from Managed Regrowth methods,* the process used to identify forest for the assessment of forest cover attainment can be repeated.

9AA Issue of certificate of entitlement—eligibility requirements for humaninduced-regeneration projects

- (1) For paragraph 15(2)(h) of the Act, this section specifies eligibility requirements that must be met in order for a certificate of entitlement to be issued in respect of an eligible offsets project that is a human induced regeneration project for a reporting period.
 - Note: The fact that these requirements are not met in relation to a reporting period does not mean that they cannot be met in relation to a subsequent reporting period within the crediting period; for example, if at the end of that subsequent reporting period forest cover has been attained.
- (2) If the offsets report for the reporting period was required to include information in accordance with paragraph 70(3A)(a)—it is an eligibility requirement that the information provided in the report, and any documents included in accordance with paragraph 71(c) to support such information, are sufficient to enable the Regulator to determine if the forest potential requirement of the applicable methodology determination for the reporting period is satisfied in relation to all carbon estimation areas that are included in the offsets report.
- (3) It is an eligibility requirement that all carbon estimation areas that:
 - (a) are included in the offsets report for the reporting period; and
 - (b) are past their forest cover assessment date;

have attained forest cover by or before the end of the reporting period.

- Note 1: Under the applicable methodology determination for the human-induced regeneration project a project proponent may choose to re-stratify the carbon estimation areas to ensure that this requirement is met in relation to a reporting period. Under section 77A of the Act a project proponent may also choose to report on all carbon estimation areas that meet this requirement in advance of any carbon estimation areas which do not meet this requirement.
- Note 2: It is intended that audit reports provided under section 79A or otherwise provided to the Regulator will be used to assist the Regulator to verify this requirement. Under subsection 9(2) if an audit report does not set out a reasonable assurance conclusion or qualified reasonable assurance conclusion a certificate of entitlement may not be issued.

- (4) For the purpose of subsection (3), a carbon estimation area has *attained forest cover* if:
 - (a) both of the following apply:
 - (i) over 90% of the area of the carbon estimation area is identified as having forest cover in accordance with the most recent version of the maps that form the basis of the National Inventory Report;
 - (ii) that version of the maps does not identify any pre-existing forest cover in the carbon estimation area, taking into account any guidelines published by the Regulator on its website for the purpose of this subparagraph, as in force from time to time; or

Note: In 2019, the Regulator's website was http://www.cleanenergyregulator.gov.au.

- (b) when assessed in 0.2 hectare portions, over 90% of those portions have attained forest cover such that the land in each portion has trees that:
 - (i) are 2 metres or more in height; and
 - (ii) provide crown cover of at least 20% of the land.
- Note: The fact that a carbon estimation area is considered to have attained forest cover under this subsection does not mean that any requirements relating to forest cover or forest potential under the applicable methodology determination for the project are satisfied.
- (5) The assessment of 0.2 hectare portions for a carbon estimation area under paragraph (4)(b) must:
 - (a) comply with any requirements set out in the CFI Mapping Guidelines for the purpose of this paragraph; and
 - (aa) use data sources and data processing approaches that:
 - (i) are the same as those relied upon to demonstrate that the carbon estimation area did not have any pre-existing forest cover; and
 - (ii) are approved by the Regulator on a list published on its website or are otherwise approved by the Regulator in writing; and
 - (b) take into account any guidelines published by the Regulator on its website for the purpose of this paragraph, as in force from time to time.

Note: In 2018, the Regulator's website was http://www.cleanenergyregulator.gov.au.

- (6) A carbon estimation area has passed its *forest cover assessment date*, when paragraph (a) and either paragraph (b) or (c) are satisfied:
 - (a) either:
 - (i) the carbon estimation area contains more than 5 tonnes of carbon per hectare under the modelling undertaken in accordance with the applicable methodology determination for the reporting period for the purpose of preparing the offsets report; or
 - (ii) the carbon estimation area is part of an eligible offsets project with less than 5 years of its crediting period remaining;
 - (b) if the carbon estimation area is an existing CEA—the date is after the later of:
 - (i) the date that is 15 years since the day the eligible offsets project first including the area was declared under section 27 of the Act disregarding any eligible growth disruption period; and

- (ii) the date that is 15 years since the modelling of forest regeneration commenced for the carbon estimation area disregarding any eligible growth disruption period;
- (c) if the carbon estimation area is not an existing CEA—the date more than 15 years since the modelling of forest regeneration commenced for the carbon estimation area disregarding any eligible growth disruption period.
- Note: The modelling of when forest regeneration commences is often described as a regeneration event in the model where carbon stocks begin to increase in the carbon estimation area.
- (7) In this section:

carbon estimation area, for an eligible offsets projects, has the meaning given by the applicable methodology determination for the reporting period.

eligible growth disruption period, means the total period of time meeting the following criteria:

- (a) occurs after carbon stocks have begun to increase following the modelling of regeneration;
- (b) during which carbon stocks are modelled not to increase under the applicable methodology determination for the reporting period;
- (c) if subparagraph (6)(b)(i) applies—does not include a period before the day the project was declared under section 27 of the Act; and
- (d) if so much of the total period that occurs after the start of the project's last or only crediting period exceeds 5 years, that period is taken to be 5 years.
- Example: If a project to which paragraph (6)(c) applies had 2 years of its eligible growth disruption period before the start of its crediting period and 6 years of eligible growth disruption after the start of its crediting period, its eligible growth disruption period would be 2+5=7 years.

existing CEA means a carbon estimation area consisting only of an area that was part of the project area for a human induced regeneration project on 15 August 2018.

forest potential requirement means a requirement for an area of land to have forest potential, within the meaning of the applicable methodology determination for the reporting period, for the land to be included in a carbon estimation area for the project.

human-induced regeneration project means either:

- (a) a project whose applicable methodology determination for the reporting period is the *Carbon Credits (Carbon Farming Initiative) (Human-Induced Regeneration of a Permanent Even-Aged Native Forest—1.1)* Methodology Determination 2013 or an earlier version of that determination applicable to the project in accordance with sections 125, 126, 127 or 130 of the Act; or
- (b) a project:
 - (i) whose applicable methodology determination for the reporting period is the *Carbon Credits (Carbon Farming Initiative) (Native Forest from Managed Regrowth) Methodology Determination 2013* or an earlier version of that methodology determinations applicable

to the project in accordance with sections 125, 126, 127 or 130 of the Act; and

(ii) whose project area includes land that was previously part of an eligible offsets project covered by the Carbon Credits (Carbon Farming Initiative) (Human Induced Regeneration of a Permanent Even Aged Native Forest 1.1) Methodology Determination 2013 or an earlier version of that determination applicable to the project in accordance with sections 125, 126, 127 or 130 of the Act.

National Inventory Report means the report of that name produced by Australia in fulfilment of its obligations under the Climate Change Convention and the Kyoto Protocol, as in force from time to time.

Note: In 2018, the National Inventory Report could be accessed from http://www.environment.gov.au.

pre-existing forest cover, for a carbon estimation area, means forest cover that existed:

- (a) if the applicable methodology determination for the reporting period is the *Carbon Credits (Carbon Farming Initiative) (Native Forest from Managed Regrowth) Methodology Determination 2013* or an earlier version of that methodology determination applicable to the project in accordance with sections 125, 126, 127 or 130 of the Act—at the time of the decision to implement the project mechanism (within the meaning of that determination) in the carbon estimation area;
- (b) if the applicable methodology determination for the reporting period is the *Carbon Credits (Carbon Farming Initiative) (Human-Induced Regeneration of a Permanent Even-Aged Forest—1.1) Methodology Determination 2013* as in force at any time until 21 March 2016— immediately before project commencement (within the meaning of that determination) for the carbon estimation area;
- (c) if the applicable methodology determination for the reporting period is the *Carbon Credits (Carbon Farming Initiative) (Human-Induced Regeneration of a Permanent Even-Aged Forest—1.1) Methodology Determination 2013* as in force at any time after 21 March 2016—at any time during the baseline period (within the meaning of that determination) for the carbon estimation area.

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

70 Information that must be set out in offsets reports

(1) For paragraph 76(4)(b) of the Act, this section specifies information that must be set out in an offsets report about an eligible offsets project for a reporting period.

•••

Information for human-induced regeneration projects
- (3A) The offsets report for a human induced regeneration project must set out the following information:
 - (a) if:
 - (i) a reporting period ends more than 5 years after the start of the project's last or only crediting period and the information required by this paragraph has not been included in an offsets report within the last 5 years; or
 - (ii) the Regulator requests, in writing, some or all of the following information in relation to a carbon estimation area after a risk based assessment of the project;

an explanation, for each carbon estimation area included in the offsets report that has not already attained forest cover:

- (iii) of the progress towards or attainment of forest cover in each such carbon estimation area and evidence supporting that progress or attainment; and
- (iv) of how the project mechanism has continued to be implemented in each such carbon estimation area and evidence supporting that continued implementation;
- (v) of how the boundaries and stratification of the carbon estimation area meet the requirements of the applicable methodology determination;

taking into account any guidelines published by the Regulator on its website for the purpose of this paragraph, as in force from time to time;

Note: In 2018, the Regulator's website was http://www.cleanenergyregulator.gov.au (b) if:

- (i) the offsets report includes a carbon estimation area that has passed its forest cover assessment date; and
- (ii) the information required by this paragraph has not already been included in an offsets report;

an explanation of the evidence that demonstrates whether or not the requirements of subsection 9AA(3) are satisfied in relation to the carbon estimation area, taking into account any guidelines published by the Regulator on its website for the purpose of this paragraph, as in force from time to time;

Note: In 2018, the Regulator's website was http://www.cleanenergyregulator.gov.au

- (c) for each carbon estimation area included in the offsets report:
 - (i) the date that the modelling of forest regeneration commenced; and
 - (ii) the estimated forest cover assessment date; and
 - (iii) details of any eligible growth disruption period; and
 - (iv) an explanation of whether forest cover has been attained; and
 - (v) the total carbon stock at the end of the reporting period, in both tonnes of carbon and tonnes of carbon per hectare, under the modelling undertaken in accordance with the applicable methodology determination for the reporting period.
- (6) In this section:

attained forest cover, in relation to a carbon estimation area, has the meaning given by subsection 9AA(4).

carbon estimation area has the meaning given by subsection 9AA(7).

eligible growth disruption period has the meaning given by subsection 9AA(7).

forest cover assessment date has the meaning given by subsection 9AA(6).

human-induced regeneration project has the meaning given by subsection 9AA(7).

71 Documents that must accompany offsets reports

For paragraph 76(4)(d) of the Act, an offsets report about an eligible offsets project for a reporting period must be accompanied by the following documents:

- (a) any document that, under the applicable methodology determination, is required to be provided to the Regulator with the offsets report;
- (b) if the project is an area-based offsets project and the project proponent has chosen to divide the project into parts in accordance with section 77A of the Act—a scale map identifying the project area to which the offsets report relates;
- (c) if the offsets report for a human induced regeneration project is required to contain information under subsection 70(3A)—documents to support the information, taking into account any guidelines published by the Regulator on its website for the purpose of this paragraph, as in force from time to time.

Note: In 2018, the Regulator's website was http://www.cleanenergyregulator.gov.au

79A Forest cover audits of human-induced regeneration projects

- (1) An eligible offsets project that is a human-induced regeneration project must be audited if:
 - (a) an offsets report for a reporting period will be submitted which includes one or more carbon estimation areas that have past their forest cover assessment date; and
 - (b) a previous audit report:
 - (i) prepared under this Division; or
 - (ii) prepared at the request of the project proponent and conducted in accordance with the requirements of section 80;

has not been provided to the Regulator confirming, by way of a reasonable assurance conclusion or a qualified reasonable assurance conclusion, that the requirements of subsection 9AA(3) are satisfied for each carbon estimation area that is included in the offsets report and has passed its forest cover assessment date.

(2) However, an audit need not be prepared if the Regulator agrees, in writing, that it is unnecessary.

- (3) The audit must be about whether the requirements of subsection 9AA(3) are satisfied in relation to the reporting period.
- (4) The report of the audit must accompany the offsets report for the reporting period mentioned in paragraph (1)(a).
- (5) In this section:

carbon estimation area has the meaning given by subsection 9AA(7).

forest cover assessment date has the meaning given by subsection 9AA(6).

human-induced regeneration project has the meaning given by subsection 9AA(7).





Australian Government

Department of the Environment and Energy

COVER SHEET FOR SUBMISSIONS

PROPOSED AMENDMENTS TO THE CARBON CREDITS (CARBON FARMING INITIATIVE) RULE 2015 RELATING TO EMISSIONS REDUCTION FUND NATIVE FOREST REGENERATION PROJECTS

Overview

The Australian Government is considering amendments to the *Carbon Credits (Carbon Farming Initiative) Rule 2015.* The Department of the Environment and Energy is inviting members of the public and industry to provide submissions. Submissions should be provided by 5:00pm AEST on Thursday 14th March 2019.

Contact details

Organisation (if applicable)		9)	Devine Agribusiness Carbon Pty Ltd	
Title	Mr	Name (required)	Dominic Devine	
Position within organisation (if applicable)		sation (if applicable)	Director	
Postal address (required)			GPO Box 948, Brisbane, Q, 4001	
Email address (required)			dac@devineagribusiness.com.au	
Phone number (optional)				

Confidentiality and publication

Unless you indicate that your submission is confidential, it will be treated as a public document. It may be published in full on the Department's website, or included in a published summary report of submissions.

If you do indicate that your submission is confidential, it will not be published on the Department's website.

Is this a confidential submission?



(If yes, please clearly mark each page of your submission 'confidential')

If only a part of your submission is confidential, for example because it contains a small amount of commercially sensitive information, please provide two clearly marked versions of the submission, a full version and one with the confidential information removed, for publication.

If your submission is published, the Department will include identifying details (author name and state/territory). Contact information (such as names, signatures, addresses or phone numbers) and information may be included in published submissions.

While the Department values public consultation highly and seeks to be transparent, it is under no obligation to publish submissions it receives, and it reserves the right not to publish submissions on its website that raise legal or other concerns.



Privacy

The Department will deal with personal information contained in, or provided in relation to, submissions in accordance with its Privacy Policy (<u>www.environment.gov.au/privacy-policy</u>).

Contact information is collected for the purposes of identifying authors and in case we need to get in touch with you in relation to your submission. Contact information and other personal information contained in submissions may be used, and disclosed within the Department and to other persons, for the purposes of consulting on the proposed amendments to the *Carbon Credits (Carbon Farming Initiative) Rule 2015*, for related purposes, and otherwise as required or permitted by law. Submissions may also be shared with other Government agencies.

If you are making a submission which contains the personal information of another

person, and you have not obtained the person's consent to their information:

- being included in your submission; and
- being used and potentially published by the Department for the purposes set out in this notice,

please de-identify or otherwise remove the personal information before providing your submission to the Department.

Liability

The views contained in published submissions are the responsibility of the authors and should not be taken to represent the views of the Department or the Australian Government. Publication does not in any way constitute endorsement of the views of the authors.

The Department does not verify the information contained in published submissions and makes no representation or warranty about the accuracy, reliability, currency or completeness of any material contained in submissions.

The Department disclaims liability, to the extent permitted by law, for any liabilities, losses, damages and costs arising from any information contained in published submissions.

Freedom of Information

A request may be made under the *Freedom of Information Act 1982* for access to a submission, including a submission marked 'confidential'. Such requests, including determining whether information is exempt from release, will be handled in accordance with provisions of the Act.

Submission instructions

Submissions are due by 5:00pm AEST on Thursday 14th March 2019. Any submissions received after this date will be considered at the Department's discretion.

Where possible, submissions should be sent electronically, preferably in Microsoft Word or other text-based formats, to the email address below.

All submissions must include this cover sheet and reference the project name.

Submissions should be sent to:

Email: <u>ERFforests@environment.gov.au</u>

Post: Forests Section Climate Change Division Department of the Environment and Energy GPO Box 787 CANBERRA, ACT 2601

Summary

The proposed rule change is for an improper purpose.

- The Carbon Credits (Carbon Farming Initiative) Act 2011 was specifically designed to provide regulatory certainty to project participants and stakeholders.
- This was done through sections 114 and 126, which provide specific provisions for amending a methodology determination, and provide that despite any future variation, the original methodology determination continues to apply to existing projects.
- The proposed rule change is, in substance if not in form, a variation to the NFMR methodology determination¹ which has potentially significant commercial implications for project participants and stakeholders.
- It would appear, and it has not been denied, that the adoption of a rule change to introduce method specific variations is specifically designed to avoid sections 114 and 126 of the Act.

The proposed rule change is unjustifiable, premature and lacks procedural fairness.

- No scientifically rigorous justification for the change has been provided.
- No scientifically rigorous demonstration of overcrediting within NFMR projects has been provided.
- No objective measurement of actual abatement *vis-à-vis* NFMR modelled abatement has been undertaken.
- An ERAC review of NFMR method is underway, however it is not complete, and its findings have not yet been published.
- It is therefore premature and procedurally unfair to impose the rule change prior to the finalisation of the ERAC review.

The proposed rule change is grossly unfair and denies natural justice to NFMR stakeholders.

- In these circumstances the question arises, why pursue this variation to the method dressed up as a rule change?
- In the absence of any alternative plausible explanation, the only remaining explanation is perhaps the worst kept secret in the ERF; the regulator has substantially overcredited a number of HIR projects, and the provisions of the Act require that a rule change (rather than a method change) is now necessary to paper over those mistakes.
- The NFMR project stakeholders are small businesses and farmers. These people committed their resources and land to the ERF in good faith and entered into other binding commercial arrangements based upon the regulatory certainty provided by the sections 114 and 126 of the Act.
- The effect of the rule change is that despite having faithfully applied the NFMR method since project inception, the NFMR stakeholders must now potentially pay for the past mistakes of the regulator, because the bureaucracy lacks the necessary courage to address these issues in a forthright and transparent manner.
- How this situation arose is a matter of public interest and this submission is therefore not confidential.

¹ For example, the rule change imposes a time frame for the achievement of forest cover where none currently exists. The explanatory statement suggests that it only 'clarifies' this time frame, however this is misleading, as it implies that some timeframe currently exists requiring clarification, when it does not. We are not suggesting it is unreasonable to impose a timeframe, only that it is improper, premature and unfair to impose one in the manner proposed.







s22	FOI 190318 Document 32
From: Sent: To: Subject: Attachments:	s22 Tuesday, 2 April 2019 9:59 AM Erfforests S22 S22 Item 5 - Native forests from managed regrowth.pdf; S22 S22

From: Emissions Reduction Assurance Committee							
Sent: Friday, 9 June 2017 3:00 PM							
To: 'andrew.macintoshs22 '; Wilson, Helen; 'Andy Lloyd'; 'Mick Keogh'; 'Paul.Grahams22 ';							
s47F	; 'Beverley Henr	y' ; 'Hilary Smith	' ; 'Suzanne A	A Jones'			
Cc: s22	;s22;	Katrina Maguir	e ; s22	;s22	;s22	;s22	;
s22	;s22	;s22	;s22	;s22	;s22	;s22	;
s22							

Subject: ERAC - Papers 26 June 2017 meeting [SEC=UNCLASSIFIED]

Dear ERAC members,

Please find <u>attached</u> your papers for the Monday 26 June 2017 meeting:

- Agenda



Item 5 – Method discussion: Native Forests from Managed Regrowth



s22

Kind regards

s22

S22
Policy Officer | ERF Governance and Policy Section
Domestic Emissions Reduction Division
Department of the Environment and Energy
☑ GPO BOX 787 Canberra, ACT, 2601

🕾 (s22 | s22 @environment.gov.au

EMISSIONS REDUCTION ASSURANCE COMMITTEE

26 June 2017 Meeting

Agenda Item 5: Native Forests from Managed Regrowth Method

For Discussion

Recommendation

That the ERAC:

1. **note** the Department is working with the Clean Energy Regulator to assess some issues with the calculation of abatement in the existing *Native Forests from Managed Regrowth* method, and will provide further advice at a later meeting.

Purpose

This paper provides, for information and discussion, an outline of aspects of abatement calculations in the *Native Forests from Managed Regrowth* (NFMR) method being assessed to help inform decisions on next steps.

Background

Overview of the NFMR method

The NFMR method (2013) provides for projects to regenerate native vegetation on previously cleared land. In the absence of a project, the land would be periodically recleared for livestock grazing. Projects must stop mechanical or chemical destruction, or suppression, of regrowth. There must be a documented decision to change land management to enable regeneration. Projects may also involve encouraging regeneration by excluding livestock, changing grazing management, or managing feral animals or weeds.

To be eligible for a NFMR project, land must:

- have been comprehensively cleared at least once in the past
- have had forest cover (trees at least two metres high, with crown cover of at least 20 per cent and covering at least 0.2 hectare) before it was cleared
- at the time of the decision to promote regeneration, have the potential to reach forest cover and not have existing forest cover.

The method credits the difference between simulated carbon stocks (calculated using FullCAM) for baseline and project scenarios.

A zero baseline can be applied if ongoing and active suppression of regrowth has resulted in immaterial carbon stocks in the 10 years before the project. Alternatively, where carbon stocks have reached a material level during that 10-year period, a baseline representing the long-term average carbon stock is calculated.

Carbon stocks for the project are estimated from vegetation regrowth occurring since the last comprehensive clearing event (before project commencement), adjusted for disturbance events such as fires.

NFMR project activities are similar to those under the *Human-Induced Regeneration* method. The two methods also have some similarities in abatement estimation. However, unlike the NFMR approach, the Human-Induced Regeneration method does not issue credits for carbon already accumulated in woody vegetation at the project registration date.

The NFMR method is scheduled for review in mid-2019.

Current projects

There are 34 registered NFMR projects, of which 23 have contracts with the Clean Energy Regulator. Devine Agribusiness Carbon Pty Ltd is the proponent for 32 projects. The projects are located in southwest Queensland.

Around 1.3 million Australian Carbon Credit Units have been issued to NFMR projects, placing the method fifth in terms of credits issued, although well below the top four methods. Total contracted abatement for NFMR projects is around four million tonnes; this compares to 80 million tonnes for the HIR method.

Abatement calculations



The method adopts a default 15-year clearing cycle (based on known typical periods between re-clearing) for modelling baseline carbon stocks. Proponents can use this default even where the actual period is longer (for example, some project reports indicate the land was last cleared in the 1990s). Where this occurs, the baseline amount deducted from the project carbon stock could be underestimated.

The method allows the Regulator to request evidence that grazing in a project area has not prevented regrowth. However, it does not require project carbon stock estimates to take into account any suppression of regrowth by grazing or other factors. If suppression is material and not accounted for, abatement could be overestimated.

In cases where projects are on land last cleared more than 20 years ago, there may be a need to assess the conditions under which vegetation has grown large enough to sequester the substantial levels of carbon reported, but has not reached forest cover at project commencement.

Consultation

The Department has consulted the Clean Energy Regulator.

Next Steps

The Department will provide more specific advice at the next meeting, depending on findings from the work discussed above.







47G

47G

47G

FOI 190318	
Document 35	

s22				
From: Sent: To: Cc: Subject:	Andrew Macintosh <andrew.macintosh@s47f Tuesday, 19 December 2017 5:45 PM Maguire, Katrina s22 ; s22 ; Wilson, Helen; s22 Re: update on NEMR FullCam guidelines [SEC=UNCLASSIFIED]</andrew.macintosh@s47f 			
Categories:	Copied to SharePoint			
Thanks Katrina.				
I appreciate all the wo	ork at this time of year.			
In short, very support preferably with 1-2 of	ive of guidelines being amended asap. s47G I'm also keen to attend the proposed site visit, ther members.			
If you have a moment	t tomorrow, I'll call to discuss.			
А				
From: Maguire, Katrina Sent: Tuesday, 19 Dece To: Andrew Macintosh Cc: s22 ; s3 Subject: update on NFN Hi Andrew I just wanted to give yo Managed Re-growth m We have discussed the it. s22 , s22 and I ha Devine fully support the FullCam guidelines in a	mber 2017 4:41:14 PM 22 ; Wilson, Helen; <u>\$22</u> AR FullCam guidelines [SEC=UNCLASSIFIED] u an update on progress with amending the FullCam guidelines for the Native Forest from ethod, as discussed at the most recent ERAC meeting. proposed amendment with the Clean Energy Regulator and they are now comfortable with live spoken to Dominic Devine at length about the change and sent them the draft guidelines. e reviews of the NFMR and HIR methods and do not support us making an amendment to the dvance of the method review. <u>\$47G</u>			
Our plan is to load, as p	per the discussion at ERAC, the amended FullCam guidelines by the end of this week, s47G Please let us know soon if you have a different view.			
to have any members of	to visit his properties in fate reprudity, which it ve salu we uper happy to and he is also happy			

Dominic has invited us to visit his properties in late February, which I've said we'd be happy to and he is also happy to have any members of ERAC who would like to attend. The Department, hopefully with the Regulator will probably take the opportunity, at the same time, to bring together representatives from the local NRM group and any interested local stakeholders and NFMR/HIR project participants to discuss the ERF and vegetation projects. ERAC may also like us to use that forum or organise other discussions specifically to inform the NFMR and HIR reviews. Stakeholders are very supportive of the NFMR and HIR reviews and my sense is many people will be willing to share their views and intel.

Just before uploading the amended guidelines I will send an email to other aggregators who have been part of the Regulator's discussions on their operational policy and posture.

Please let us know if you'd like the secretariat to pass this update on to all ERAC members. Katrina Maguire

Assistant Secretary Land and Outreach Branch Climate Change Division Department of the Environment and Energy t: 02 6159 7600 | m: s22 e: katrina.maguire@environment.gov.au GPO Box 787 | Canberra ACT 2601 www.environment.gov.au





An Australian Government Initiative

FOI 19	0318
Docum	ent 36

s22				
From: Sent: To:	s22 Thursday, 1 March 2018 4:26 'hilarys47F	PM '; 'beverley.henry	(@s47F'	
Cc: Subject: Attachments:	Katrina Maguire; s22 ; s			

Dear Hilary and Beverley,

I have attached a briefing pack for your visit to Charleville. We will be happy to provide a hard-copy (tabbed) for you when the team sees you on Monday, if that would be useful?

Please note that the included talking points are only for your guidance – you don't need to follow them word for word.

If there is anything else you would like included, please let Katrina or s22 know tomorrow.

Kind regards,

s22

s22Assistant Director, ForestsClimate Change DivisionDepartment of the Environment and Energys22g22

Please note I work Monday to Thursday


Background briefing for Charleville trip 5-9 March 2018

s22	
Logistics	12
Site visit information and projects in the region	
s22	



Logistics

Contact numbers

Department of the	Clean Energy	ERAC members	Queensland	Carbon service providers and others	
Environment and Energy	Regulator		Government		
Katrina Maguire:	Mary-Anne Wilson:	Beverley Henry:	s47F	Vicki Franklin (Agforce):	Dominic Devine (Leichardt):
s22	s22	s22	s22 1	s47F	s47F
s22 :	s22 :	Hilary Smith:	s22	Skye Glenday (Climate	Rhonda Toms-Morgan
s22	s22	s22	s22	Friendly):s47F	(ConnectAg): s47F
s22 :				Gary Wyatt (Corporate	Terri (Charleville RSL):
s22				Carbon): s47F	(07) s47F
s22 :					
s22					
s22 -					
Canberra:					
s22					

Itinerary



S	22		
Thursday 8	Depart Cunnamulla ~ 06.00- 06.30 to meet Dominic Devine at Bollon Café by 08.30 (Google Maps says 2 hrs 21 mins, Dominic says 2 hrs) for breakfast	All day. Leichardt (formerly Devine Agribusiness) site visits: S47G(1)(b)	Merino Motor Inn 78 Victoria Street St George Ph: 07 4625 3333
	Hire cars to/from Bollon; cars provided and driven by Dominic Devine and Graham Kenny around Leichardt properties	Dominic to provide lunch (sandwiches) at Department's expense Contacts: Dominic Devine, Graham Kenny s22 and s22 (tbc): catch-up over dinner with s47F	
Friday 9	Depart St George by ~ 07.30 to allow for 2 hrs 10 mins travel time (Google Maps), return of hire cars and any delays	Return cars to Roma Airport Commercial Vehicles Airport Drive, Roma Ph: 07 4638 2999	

Flights:	The car hire office will be closed (opens 10.30am). Please park the car and	
• QF2541: depart Roma	leave the keys in the after-hours drop off box. Leave parking ticket in the	
11:05, arrive Brisbane	vehicle to avoid fine	
12:15		
• QF1549: depart Brisbane		
14:10, arrive Canberra		
17:00		





Site visit information and projects in the region

Projects to be visited

Day	Project name	Project ID	Scheme participant	Method	Carbon service provider	
			1		1	
	4 -			NFMR	Leichardt	
Thursday 8	S47	′G(1)(b)		(Devine)	



Annual rainfall in Maranoa area



Major vegetation groups in Queensland



























































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s22								
From		- 11						
FIUIII.		522 Friday 11 M	Day 2010 4.1					
Sent:		Friday, 11 IV	iay 2018 4:1					
То:		'Hilary Smith	ו'; 'Beverley	Henry'; 'Mick	: Keogh';	'Andrew M	lacintosh'	
Cc:		s22	; Magu	ire, Katrina; s	22		; s22	; s22
		; s22	; s	22	s22	; s47F		
Subject:		ERAC subco	mmittee me	eting 14 Ma	y: papers	SEC=UNC	CLASSIFIED]	
Attachments:		s22			· · ·	-		
						Consultat	ion Charlev	ille site visit
		summary.do)CX; s22				-	_
		,						

Dear subcommittee members

The following papers for Monday's meeting are attached. Apologies for not getting these to you earlier.



- Detailed notes from Queensland and New South Wales site visits. These are combined notes from Department representatives and Committee members. We have provided them as a general reference source.





Regards

s22 Director, Forests Section Climate Change Division Department of the Environment and Energy Ts22 M s22 s22 @environment.gov.au To: 'Hilary Smith' ; s22 Cc: Beverley Henry ; Mick Keogh ; Andrew Macintosh Subject: RE: NFMR meeting on 14th [SEC=UNCLASSIFIED]

Hi Hilary

We are putting an agenda and other papers together, and will send them as soon as possible.

The meeting is 10-12 on Monday, in the John Gorton Building.

Regards

s22

From: Hilary Smith [mailto:hi	lary@s47F		
Sent: Tuesday, 8 May 2018 1	2:31 PM		
To: s22 s22 @e	environment.gov.au>; s22	s22	@environment.gov.au>
Cc: Beverley Henry <s47f< td=""><td>>; Mick Keogh</td><td><s47f< td=""><td>>; Andrew Macintosh</td></s47f<></td></s47f<>	>; Mick Keogh	<s47f< td=""><td>>; Andrew Macintosh</td></s47f<>	>; Andrew Macintosh
<andrew.macintoshs47f< td=""><td>></td><td></td><td></td></andrew.macintoshs47f<>	>		
Subject: NFMR meeting on 14	4th		

Dear **s22** Do we have an agenda and venue for this meeting? Can you please confirm details. Thanks Hilary

Sent from my Sony XperiaTM smartphone

Summary of Charleville site visits - Emissions Reduction Fund: native forest revegetation methods

Tuesday 6th -8th March 2018

Emissions Reduction Assurance Committee: Hilary Smith, Beverley Henry

<u>Clean Energy Regulator</u> : s47F	, s22
Department: Katrina Maguire -22	-22
Department: Katrina Maguire, SZZ	, SZZ

These notes on the site visits in the Charleville area have been compiled by the Department and incorporate comments from participating members of the ERAC subcommittee. They have been prepared to document what was seen and heard on the visits, for use by the subcommittee and Department in undertaking the method reviews.

Projects visited

Day	Project name	Project ID	Scheme participant	Method	Carbon service provider	
\frown						
Thursday 8	170	ERF102124	170	NFMR	Leichardt	
inuisuay o	47G		47G		(Devine)	







S47F

S47F

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s45, s22

s45, s22

FOI 190318 Document 39

s22	
From:	Beverley Henry <beverley.henry@qut.edu.au></beverley.henry@qut.edu.au>
Sent:	Thursday, 26 July 2018 10:16 PM
То:	s22
Cc:	Hilary Smith; Andrew Macintosh; Katrina Maguire; s22 s22 s22 ;
	s22 s22 ; mjkeogh@s22
Subject:	Re: Details for Tuesday's subcommittee meeting [SEC=UNCLASSIFIED]

His22

That timing's fine thanks. My flight isn't until around 4pm. Kind regards Beverley Sent from my iPhone

On 26 Jul 2018, at 9:09 pm, s22 s22 @environment.gov.au> wrote:

Sorry Hilary. A couple of clarifications. We expect the meeting with the aggregators at the CER to run from 9.00 to 10.30, subject to confirmation with the CER. We are suggesting then going back to John Gorton Building for the follow-up discussions with you and the phone call with Dominic Devine, and allowing up to 2.00 for these.

Paul						
From: Hilary S	mith [<u>mailto</u>	<u>o:hilary@</u> s2	2]	
Sent: Thursday	, 26 July 20	18 9:05 PM				
To: 'Andrew M	acintosh' < <u>a</u>	ndrew.maci	ntosh@s22	>; Bev	erley Henry	,
< <u>beverley.henry</u>	<u>y@</u> s22	>; s22	s22	<u>@enviror</u>	<u>1ment.gov.a</u>	<u>u</u> >
Cc: Maguire, K	atrina < <u>Katr</u>	ina.Maguire	e@environn	<u>nent.gov.au></u> ;	, s22	
s22	@environme	<u>ent.gov.au</u> >;	s22			
s22	@enviror	nment.gov.a	<u>u</u> >;s22			
s22	@environm	ent.gov.au>	;s22			
s22	<u>@envi</u>	ronment.gov	<u>v.au</u> >; <u>mjkeo</u>	ogh@s22		
Subject: RE: D	etails for Tu	esday's sub	committee n	neeting [SEC	UNCLAS	SIFIED]

Hi s22

Can you please clarify whether you want up to 2 hours for the discussion (taking the meeting to 11:00 or 12:00?) or up to 2:00PM?

And it also sounds like you want to relocate back to John Gorton Building after the meeting in Civic - is that correct?

Thanks

Hilary

Sent from my Sony XperiaTM smartphone

---- s22 wrote ----

Dear Beverley, Hilary and s22

We have confirmed with the Clean Energy Regulator that we will meet aggregators in Canberra on Tuesday, before the Regulator holds another workshop with them on its technical guidance.

We aim to start the meeting at 9.00, at the Regulator's offices, 5 Farrell Place, Civic. We expect representatives from Climate Friendly, Corporate Carbon, GreenCollar, Select Carbon

and CO2 Australia will attend. We expect to receive a paper from the aggregators on their proposal for an alternative to the Department's proposed amendment to the Rule, before the meeting.

Following the subcommittee, we propose to come back to the Department to discuss the alternative proposal as well as the data analysis supporting the Rule proposal and the review report with you. We will also schedule a telephone discussion with Dominic Devine, who is aware of the alternative proposal. We would like to allow up to around 2.00 for these discussions. Please let us know if you will have any problems with availability for this amount of time.

Regards

s22

Director, Forests Section

Climate Change Division

Department of the Environment and Energy

T - 22	Magg
ISZZ	INI SZZ

s22 <u>@environment.gov.au</u>

From: Andrew Macintosh [mailto:andrew.macintosh@s22]]						
Sent: Wedr	Sent: Wednesday, 25 July 2018 5:20 PM					
To: Maguir	e, Katrina < <u>Katrina.Magui</u>	re@environm@	ent.gov.au>; s22			
s22	@environment.gov.au>; S2	22	Andrew.Bray@environment.gov.au>			
Cc: Beverle	y Henry < <u>beverley.henry@</u>	<u>@</u> s22 >;	Hilary Smith			
< <u>hilary@</u> s2	2	>; <u>mjkeogh@</u>	s22			
Subject: Tu	lesday sub com meeting					

Arvo All

As discussed, the sub com would like to hold a face to face meeting on next Tuesday morning. **\$22** and Katrina, could you please organise relevant travel and a venue?

As part of the meeting, we would like to offer aggregators an opportunity to address the sub com. The Regulator also has a meeting with aggregators on Tuesday starting at 10am so we could arrange for the meetings to run back to back.

Sorry Sub com members but it will mean an early start if you are coming in the morning.

For clarity, the sub com is expecting the public consult to start as close to Wednesday as possible, although we acknowledge that timing is ultimately up to the minister.

Thanks



FOI 1	90318
Docur	nent 40

s22		
From: Sent: To: Cc: Subject: Attachments:	s22 Monday, 30 July 2018 6:40 PM 'Andrew Macintosh'; Beverley Henry; 'Hilary Smith' Maguire, Katrina; s22 ; s22 Papers for meetings tomorrow [SEC=UNCLASSIFIED] Agenda_ERAC and CER_31 July 2018.docx; s22	s22
	s4	.5
Follow Up Flag: Flag Status:	Follow up Completed	

Hi Andrew, Beverley and Hilary

A draft agenda for the meetings tomorrow is attached. This is for your use, to give you an idea of how we see the discussions going.



We will bring hardcopies of the papers.

See you tomorrow.

s22 Director, Forests Section **Climate Change Division** Department of the Environment and Energy Ts22 M s22 s22 @environment.gov.au

Emissions Reduction Assurance Committee Subcommittee – HIR and NFMR method reviews

Draft Agenda: Tuesday 31 July 2018 Location 1: 5 Farrell Place, Canberra Location 2: John Gorton Building, Parkes, Canberra

		1. Meeting with aggregators, Clean Energy Regulator and Department, 9.00 – 10.30 (5 Farrell Place)	
Time	No	Item	Lead
S		22	
		2. Subcommittee meeting with Department	
		11.30 – 2.00 (John Gorton Building)	
s22			
12:15pm	2)	Teleconference with Dominic Devine	Chair
Sź	2	2	

Please see following page for list of expected participants.

Expected participants

Emissions Reduction Assurance Committee

Andrew Macintosh (Chair), Beverley Henry, Hilary Smith

Industry (attendees not confirmed) - Part 1 of meeting

Climate Friend	lly
s47F	
s47F	

Corporate Carbon - Gary Wyatt

Terra Carbon/GreenCollar Group

s47F	
s47F	
s47F	
CO ₂ Australia - s47F	
Select Carbon – s47F , s47	′F

Leichardt Group - Dominic Devine and Graham Kenny (separate teleconference)

Department of the Environment and Energy

Katrina Maguire, Assistant Secretary, Land Branch

Rob Sturgiss, Assistant Secretary, National Inventory Systems and International Reporting Branch (Part 2 of meeting)

s22 , Director, Geospatial Analysis Unit (Part 1)

s22, Land Inventory Team (Part 1)

- s22, Director, Forests Section
- s22, Forests Section
- s22, Forests Section
- Australian Government Solicitor

s22, Counsel (TBC)

Clean Energy Regulator

- s22 , General Manager, Contact Centre and Metrics and Markets.
- s22, Manager, Regulatory Improvement and Strategy

s22

From:	s22
Sent:	Friday, 17 August 2018 11:14 AM
То:	'Andrew Macintosh'
Subject:	Devine Agribusiness Carbon - correspondence [SEC=UNCLASSIFIED]
Attachments:	Rule Amendment_Devine Agribusiness_Minister reply_draft.docx

Hi Andrew

Our early draft reply to the letter from Devine Agribusiness is attached for your information.

Kristin mentioned she is catching up with you today. I gave her a short update on where things are up to.

s22

From: s22

Sent: Thursday, 16 August 2018 5:28 PMTo: 'Andrew Macintosh'Subject: FW: Devine Agribusiness Carbon - CFI Rule change [SEC=UNCLASSIFIED]

Hi Andrew

When you have a few minutes I can give you some more background. I also have some questions for you on handling with the ERAC.

Thanks

s22

From: s47F	
Sent: Thurso	y, 16 August 2018 5:11 PM
To: Andrew	acintosh < <u>andrew.macintosh@</u> s22 >; Williamson, Mark
< <u>Mark.Willia</u>	<pre>ison@cleanenergyregulator.gov.au>; Maguire, Katrina <katrina.maguire@environment.gov.au></katrina.maguire@environment.gov.au></pre>
Cc: s22	s22 <u>@environment.gov.au</u> >; s47F s47F
	<u>cleanenergyregulator.gov.au</u> >

Subject: RE: Devine Agribusiness Carbon - CFI Rule change [SEC=UNCLASSIFIED]

UNCLASSIFIED

Hi Andrew,

I am writing to provide a brief update on the discussion with Dominic Devine today. **\$22** and Mark might want to add more to the summary. **\$47C**

47G, s47C

s47C, 47G

Let me know if you require further information?

s47F



s47F

Manager

Market Intelligence and Client Support Scheme Entry and Entitlement Division (02) 6159 s47F www.cleanenergyregulator.gov.au

Think before you print

UNCLASSIFIED

From: And	rew Macin	tosh < <u>andrew.macintosh@</u> s22 >	
Sent: Frida	iy, 10 Augu	ust 2018 9:08 AM	
To: Willian	nson, Mark	<pre>x <<u>Mark.Williamson@cleanenergyregulator.gov.au</u>>; Maguire, Katrina</pre>	
< <u>Katrina.</u>	1aguire@ei	nvironment.gov.au>	
Cc: s22	s22	<u>@environment.gov.au</u> >; s47F	; Wilson,
s47F	s47F	@cleanenergyregulator.gov.au>	
Subject: RI	E: Devine A	gribusiness Carbon - CFI Rule change [SEC=UNCLASSIFIED]	

Will do

From: Willia	amson, N	lark < <u>Mark.Williamson@cleanenerg</u>	yregulator.gov.au>	
Sent: Friday	y, 10 Augi	ust 2018 9:06 AM		
To: Andrew	/ Macinto	sh < <u>andrew.macintosh@</u> s22	>; Maguire, Katrina	
< <u>Katrina.M</u>	aguire@e	nvironment.gov.au>		
Cc: s22	s22	<u>@environment.gov.au</u> >; s47F		;s47F ,
s47F	s47F	<u>@cleanenergyregulator.</u>	gov.au>	

Subject: RE: Devine Agribusiness Carbon - CFI Rule change [SEC=UNCLASSIFIED]

UNCLASSIFIED

Thanks Andrew

My landline is best if you can.

Mark



Mark Williamson Executive General Manager

Scheme Entry and Entitlement Division

(02) 6159 3961 | mark.williamson@cleanenergyregulator.gov.au

www.cleanenergyregulator.gov.au

🔇 Think before you print

UNCLASSIFIED

 From: Andrew Macintosh <<u>andrew.macintosh@s22</u>
 >

 Sent: Friday, 10 August 2018 8:33 AM
 To: Maguire, Katrina <<u>Katrina.Maguire@environment.gov.au</u>>; Williamson, Mark

 <<u>Mark.Williamson@cleanenergyregulator.gov.au</u>>;
 Williamson, Mark

 Cc: s22
 s22
 @environment.gov.au>; s47F
 ; Wilson,

 s47F
 s47F
 @cleanenergyregulator.gov.au>

 Subject: Day Daving Agribusinges Carbon
 CFL Dulo shange [SEC=LUNCLASSUFIED]

Subject: Re: Devine Agribusiness Carbon - CFI Rule change [SEC=UNCLASSIFIED]

I can do 9.10 and can arrange the 3 way. I'm booked from 10-10.30, and from 12 until about 3pm.

А

From: Maguire, Katrina <<u>Katrina.Maguire@environment.gov.au</u>>
Sent: Thursday, 9 August 2018 7:25:30 PM
To: Williamson, Mark
Cc: Andrew Macintosh; s22 ; s22 ; s47F
Subject: Re: Devine Agribusiness Carbon - CFI Rule change [SEC=UNCLASSIFIED]

I can do 9:10 but can't organise a three way conference until I get in in the morning

Sent from my iPhone

On 9 Aug 2018, at 6:50 pm, Williamson, Mark <<u>Mark.Williamson@cleanenergyregulator.gov.au</u>> wrote:

UNCLASSIFIED

Hi Andrew

Yes, certainly open to a chat. However, my calendar is tight from 9.30am to midday. I could do before or after that.

Katrina, I agree the Department should coordinate both our comments to **s22** and the proposed reply. Mary-Anne will take the lead at our end on that.

Regards

Mark

Mark Williamson Executive General Manager

Scheme Entry and Entitlement Division (02) 6159 3961 | <u>mark.williamson@cleanenergyregulator.gov.au</u> <u>www.cleanenergyregulator.gov.au</u>

UNCLASSIFIED

From: Andrew Macintosh <<u>andrew.macintosh@s22</u> > Sent: Thursday, 9 August 2018 6:13 PM To: Maguire, Katrina <<u>Katrina.Maguire@environment.gov.au</u>>; Williamson, Mark <<u>Mark.Williamson@cleanenergyregulator.gov.au</u>> Cc: s22 s22 @environment.gov.au> Subject: RE: Devine Agribusiness Carbon - CFI Rule change [SEC=UNCLASSIFIED]

I reckon we should have a quick chat in the morning to discuss.

Anyone interested?

 From: Maguire, Katrina < Katrina.Maguire@environment.gov.au</td>

 Sent: Thursday, 9 August 2018 5:48 PM

 To: Williamson, Mark < Mark.Williamson@cleanenergyregulator.gov.au</td>

 Cc: Andrew Macintosh < andrew.macintosh@s22</td>

 s22
 @environment.gov.au

 Subject: RE: Devine Agribusiness Carbon - CFI Rule change [SEC=UNCLASSIFIED]

Hi Mark and Andrew – to avoid sending s22 3 different responses can you pls send us your views on the letter and we'll pull it together in a draft response and email to s22 Thanks KAtrina

From: s22

 Sent: Thursday, 9 August 2018 1:12 PM

 To: Williamson, Mark <<u>Mark.Williamson@cleanenergyregulator.gov.au</u>>

 Cc: Andrew Macintosh <<u>andrew.macintosh@s22</u> >; Maguire, Katrina

 <<u>Katrina.Maguire@environment.gov.au</u>>; s22 s22 @environment.gov.au>

 Subject: Re: Devine Agribusiness Carbon - CFI Rule change [SEC=UNCLASSIFIED]

I agree, before. Just part of the ongoing stakeholder engagement.

Sent from my iPhone

On 9 Aug 2018, at 12:37 pm, Williamson, Mark <<u>Mark.Williamson@cleanenergyregulator.gov.au</u>> wrote:

UNCLASSIFIED

Yes, agree with Andrew's comment.

s47F and I are planning a visit to see Mr Devine shortly to show him our improving geospatial capability and to step him through the requirements of the law and how we will apply that. As he says in part of his letter, that includes removing areas without forest potential.

s22, we may need to discuss whether our meeting with him may be best before or after the Minister's reply. I think before.

Regards

Mark

Mark Williamson Executive General Manager

Scheme Entry and Entitlement Division (02) 6159 3961 | <u>mark.williamson@cleanenergyregulator.gov.au</u> <u>www.cleanenergyregulator.gov.au</u>

UNCLASSIFIED

From: Andrew Macintosh <<u>andrew.macintosh@s22</u> > Sent: Thursday, 9 August 2018 12:15 PM To: s22 s22 <u>@environment.gov.au</u>>; Maguire, Katrina <<u>Katrina.Maguire@environment.gov.au</u>>; s22 s22 <u>@environment.gov.au</u>>; Williamson, Mark <<u>Mark.Williamson@cleanenergyregulator.gov.au</u>> Subject: RE: Devine Agribusiness Carbon - CFI Rule change

Thanks **s22**. We'll take a look and report back.

А

 From: s22
 s22
 @environment.gov.au>

 Sent: Thursday, 9 August 2018 11:54 AM

 To: Andrew Macintosh <andrew.macintosh@s22</td>
 >; Maguire, Katrina

 <Katrina.Maguire@environment.gov.au>; s22

 s22
 @environment.gov.au>; Williamson, Mark

 <Mark.Williamson@cleanenergyregulator.gov.au>

 Subject: Fwd: Devine Agribusiness Carbon - CFI Rule change

Welcome any views next week

Thanks

Sent from my iPhone

Begin forwarded message:

From: "Graham Kenny" <<u>graham.kenny@leichardt.com.au</u>> To: "s22 " s22 @environment.gov.au>

Cc: "Dominic Devine" <<u>dominic.devine@leichardt.com.au</u>> Subject: Devine Agribusiness Carbon - CFI Rule change

Dear s22,

We attach a letter from Devine Agribusiness Carbon to the Minister outlining our concerns regarding the proposed CFI rule change as discussed with you recently, together with some supporting information.

Could you please see that it receives the Minister's attention.

Regards

Graham Kenny Devine Agribusiness Carbon Pty. Ltd.

graham.kenny@leichardt.com.au T: 07 3226 7777 GPO Box 948, Brisbane Qld 4001 Level 22, 127 Creek Street, Brisbane Qld 4000

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s22

From:	Andrew Macintosh <andrew.macintosh@s22></andrew.macintosh@s22>
Sent:	Thursday, 18 October 2018 4:16 PM
То:	s22 ; Thompson, Shayleen; Katrina Maguire; s22
Subject:	Devine Agribusiness

Arvo All

I just noticed Devine Agribusiness has either changed its name or been acquired by another entity. See: <u>http://www.leichardt.com.au/</u>.

The website suggests it was just a name change. s47C

А

Andrew Macintosh Professor ANU Law School ANU College of Law Wk: 61 2 6125 3832 Mb: s47F s22

From:	Erfforests
Sent:	Friday, 29 March 2019 9:50 AM
То:	s22
Subject:	FW: Draft slides and meeting notes for presentation on Monday [SEC=UNCLASSIFIED]
Attachments:	ERAC review findings overview 2 Dec 2018.pptx

From: Andrew Macintosh [mailto:andrew.macintosh@s47FSent: Sunday, 2 December 2018 5:27 PMTo: s22; Hilary Smith ; Beverley Henry ; mjkeogh@s47FCc: s22

Subject: Re: Draft slides and meeting notes for presentation on Monday [SEC=UNCLASSIFIED]

Hi All

Please find attached revised slides for the meeting tomorrow.

Plan re NFMR is to discuss issues but state that the ERAC has not reached a position on it - i.e. the truth.

s22 and s22 , I'm happy for these to be circulated when you are ready (others, sorry about the late notice).

А

From: s22

Sent: Friday, 30 November 2018 6:53:05 PM To: Andrew Macintosh Cc: s22

Subject: Draft slides and meeting notes for presentation on Monday [SEC=UNCLASSIFIED]

Hi Andrew

Draft slides for Monday are attached for you to consider. They are based on this afternoon's version of the findings.



I've added a final slide on next steps as discussed.

Once you get back to me on the final version, I'll send it to other subcommittee members together with the info below, and we'll send it to meeting attendees on Monday morning.

Notes for presentation

• Suggested agenda:

- o Update on rule amendment
- o Where the review of the methods is up to
- o Overview of findings and recommendations
 - Mention handling of other NFMR findings and recommendations

o Next steps:

- Process aspects: ERAC consideration, finalisation, write to Minister [Indicative timing?]
- Future directions for the methods
- o We have ordered morning tea for 10.30
- Update on rule
 - o Amendment for HIR registered on Friday 30 November

o Department is still considering best approach for NFMR

Attendees

Climate Friendly: s47F	,s47F	(in perso	on)	
CO2 Australia: s47F (in person)				
Corporate Carbon: s47F (phone)				
Select Carbon: s47F	,s47F	(phone	2)	
GreenCollar: s47F	,s47F	(phone)		
Australian Integrated Carbon Financial Services: s47F (phone)				
Devine Agribusiness: Dominic Devine, Graham Kenny (phone)				
Clean Energy Technology: s47F (phone)				
Country Carbon: s47F (phone)				
Carbon Farmers of Austral	lia: s47F	(adviser – in	person)	

Note the CER is meeting the agents on Monday afternoon, in the first of planned regular meetings to discuss general scheme/project administration. They will be at our meeting, and can give a very update on the status of the guidelines if attendees ask.

Thanks

s22

s22

From:	s22	
Sent:	Wednesday, 5 December 2018 1:49 PM	
То:	'Beverley Henry'; 'mjkeogh@s47F	
Cc:	Katrina Maguire; s22 ; s22 ; 'Andrew Macintosh'; 'Hilary Smith'	
Subject:	Draft meeting outcomes - ERAC subcommittee meeting with stakeholders 3 Dec	
	2018 [SEC=UNCLASSIFIED]	
Attachments:	ERAC_review subcommittee stakeholder meeting outcomes_3dec2018.docx	

Hi Beverly and Mick

Please find attached draft notes from Monday's meeting with stakeholders. These have been drafted to support your update to ERAC next week. Please let me know if you have any amendments you would like me to incorporate.

Kind regards

s22

s22
Assistant Director
Forests Section
Climate Change Division
Department of the Environment and Energy
s22
Office Hours: 8am to 2:30pm, Monday-Friday

The Department acknowledges the traditional owners of country throughout Australia and their continuing connection to land, sea and community. We pay our respects to them and their cultures and to their elders both past and present



FOI 190318 Document 48

s22

From:	Beverley Henry <beverley.henry@s47f></beverley.henry@s47f>	
Sent:	Wednesday, 5 December 2018 4:17 PM	
То:	s22 ; 'mjkeogh@s47F '	
Cc:	Katrina Maguire; s22 s22 ; 'Andrew Macintosh'; 'Hilary Smith'	
Subject:	RE: Draft meeting outcomes - ERAC subcommittee meeting with stakeholders 3 Dec	
	2018 [SEC=UNCLASSIFIED]	
Attachments:	ERAC_review subcommittee stakeholder meeting outcomes_3dec2018_bh.docx	

His22

Thanks for your support in Monday's meeting and for the comprehensive notes which are a very good record of the discussions. I've nothing major but have made a couple of additions/suggestions on the attached (subject to Mick's thoughts also).

Thanks again Beverley

Beverley Henry

Mob: s47F

Email: <u>beverley.henry@</u>s22

From: s22

Sent: Wednesday, 5 December 2018 1:49 PM

To: Beverley Henry ; 'mjkeogh@s22

Cc: Katrina Maguire ; s22 ; s22 ; 'Andrew Macintosh' ; 'Hilary Smith'

Subject: Draft meeting outcomes - ERAC subcommittee meeting with stakeholders 3 Dec 2018 [SEC=UNCLASSIFIED]

Hi Beverly and Mick

Please find attached draft notes from Monday's meeting with stakeholders. These have been drafted to support your update to ERAC next week. Please let me know if you have any amendments you would like me to incorporate.

Kind regards

s22

s22 Assistant Director Forests Section Climate Change Division Department of the Environment and Energy s22

Office Hours: 8am to 2:30pm, Monday-Friday

The Department acknowledges the traditional owners of country throughout Australia and their continuing connection to land, sea and community. We pay our respects to them and their cultures and to their elders both past and present


FOI 190318 Document 49

s22

From:	Andrew Macintosh <andrew.macintosh@s22></andrew.macintosh@s22>
Sent:	Wednesday, 5 December 2018 12:46 PM
То:	s22
Cc:	Katrina Maguire
Subject:	RE: Timing for talking to Devine Agribusiness about review outcomes
-	[SEC=UNCLASSIFIED]

Thanks s22

I'll call later to discuss. Could actually be good because it would be good to get the entire Committee's views on NFMR before consulting s47C

If the whole Committee agrees with the current drafting, we'll need to consulting him on basis of procedural fairness.

А

From: s22 Sent: Wednesday, 5 December 2018 12:25 PM To: Andrew Macintosh Cc: Katrina Maguire Subject: Timing for talking to Devine Agribusiness about review outcomes [SEC=UNCLASSIFIED]

Hi Andrew

I hope you are recovering.

Graham Kenny contacted me to say he is travelling and will come back to us at the end of the week about a time next week to discuss NFMR review outcomes.

Not ideal for the ERAC meeting, but there's not much we can do about it.

s22

FOI	190318	
Doc	ument 51	

s22	
From: Sent: To: Cc: Subject:	Hilary Smith <hilary@s22> Monday, 10 December 2018 8:13 AM 'Andrew Macintosh'; 'Beverley Henry'; s22 ; mjkeogh@s22 s22 ; s22 ; s22 RE: Availability for teleconference with Devine Agribusiness, 2.00 Tuesday 11 December [SEC=UNCLASSIFIED]</hilary@s22>
2-3PM on 11 th is fine for me. Hilary	
From: Andrew Macintosh Sent: Friday, 7 December 2018 3 To: Beverley Henry ; s22 ; Cc: s22 s22 Subject: Re: Availability for telect [SEC=UNCLASSIFIED]	:44 PM Hilary Smith ; mjkeogh@s22 ; s22 onference with Devine Agribusiness, 2.00 Tuesday 11 December
I can do 2pm but must be gone a From: Beverley Henry < <u>beverley</u>	it 3pm sharp . <u>henry@</u> s22 >

Sent: Friday, 7 December 2018 3:29:57 PM

To: s22 ; Andrew Macintosh; Hilary Smith; <u>mjkeogh@</u>s22

Cc: s22 ; s22 ; s22

Subject: RE: Availability for teleconference with Devine Agribusiness, 2.00 Tuesday 11 December [SEC=UNCLASSIFIED]

His22

I should be available at 2pm on 11th and am interested in joining the phone hook-up on NFMR.



Kind regards Beverley

Beverley Henry

Mob: s47F | Email: <u>beverley.henry@</u>s22

 From: s22
 s22
 @environment.gov.au>

 Sent: Friday, 7 December 2018 3:14 PM

 To: 'Andrew Macintosh' <andrew.macintosh@s22</td>
 >; Hilary Smith <hilary@s22</td>

 Beverley Henry <beverley.henry@s22</td>
 >; mjkeogh@s22

 Cc: s22
 s22
 @environment.gov.au>; s22

 s22
 genvironment.gov.au>; s22
 s22

Subject: Availability for teleconference with Devine Agribusiness, 2.00 Tuesday 11 December [SEC=UNCLASSIFIED]

Dear HIR and NFMR review subcommittee members

Devine Agribusiness have suggested 2.00pm on Tuesday 11 December to discuss the review's draft findings and recommendations on the NFMR method. Could you please let me know whether you would be able to dial in for a discussion at that time?

Also, our notes from the meeting held on Monday to discuss findings with carbon service providers are attached, to support discussion at the ERAC meeting on Monday. Mick, please feel free to add any comments.

Thanks

s22 Director, Forests Section Climate Change Division Department of the Environment and Energy T s22 M s22 s22 @environment.gov.au

FOI 190318 Document 52

s22

From:	s22
Sent:	Monday, 10 December 2018 1:06 PM
То:	'Andrew Macintosh'; Beverley Henry; Hilary Smith
Subject:	Teleconference details for discussion with Dominic Devine and Graham Kenny [SEC=UNCLASSIFIED]

Hi Andrew, Beverley and Hilary

I have confirmed the teleconference with Dominic Devine and Graham Kenny for 2 to 3 pm tomorrow.

The dial-in number is 1800 047 396 The participant code is 716464

Thanks

s22

s22 From: s22 Sent: Thursday, 13 December 2018 1:53 PM To: Beverley Henry; 'Andrew Macintosh'; Hilary Smith Cc: s22 Subject: For consideration: draft notes from teleconference with Devine Agribusiness [SEC=UNCLASSIFIED] Attachments: Consultation_ERAC_Devine Agribusiness_11Dec2018_Notes.docx

Hi Andrew, Beverley and Hilary

Our draft notes from the teleconference with Dominic Devine and Graham Kenny are attached for comment.

We have tried to capture the main points made, and have grouped them by ERAC comments and Devine Agribusiness comments. Please let us know whether you would like any points added, removed or revised.

We will forward the final notes to Dominic and Graham on your behalf.

s22

Thanks

s22

FOI 190318 Document 54

SZZ	
From:	Beverley Henry <beverley.henry@s47f></beverley.henry@s47f>
Sent:	Friday, 14 December 2018 1:19 PM
То:	Andrew Macintosh; s22 Hilary Smith
Cc:	s22
Subject:	RE: For consideration: draft notes from teleconference with Devine Agribusiness [SEC=UNCLASSIFIED]
Attachments:	Consultation_ERAC_Devine Agribusiness_ 11Dec2018_Notes_bh.docx

His22 and all

Thanks for the notes – they are a good record of the discussions. Like Andrew, I had a suggestion on the dot point on SLATS regrowth clearing. There were also two minor suggested edits – for consideration only.

On the SLATS point, Qld data reports regrowth clearing (i.e. clearing of veg that is regrowing but which has not achieved sufficient height and cover 'maturity' to be classed as remnant. It also reports repeat clearing based on a time series of clearing since 1988 which shows the same parcel of land having been cleared more than once. For the whole state repeat clearing was has been about 30% over the past years to 2016 (last report), bearing in mind that around half the clearing is in the Brigalow Belt (see below). The rate in the Mulga Lands is variable as shown in recent years by permitted clearing for fodder (although most has still been on Cat X land).

For interest I've also pasted a page from the 2008-09 at which time SLATS reported the number of times detected as cleared (no longer reported). The times cleared will very likely have increased over the past 10 yrs and regional data would be needed to understand what is happening in the NFMR project areas. **s47C**



Figure 14: Repeat woody vegetation clearing as a percentage of total woody vegetation cleared for each period (1988–2016)



1st event Repeat clearing event

Figure 23: Time series for clearing rates for initial and repeat clearing events (1988–2009).

For 2008–09 era, of the 99 940 ha/year cleared, 15 240 ha/year (15%) has previously been detected as woody vegetation clearing. Table 10 (this page) shows the rates of woody vegetation clearing of repeat clearing events for each era.

Table 10: Woody vegetation clearing by repeat incidence (1988-2009)

Period	Rate of woody vegetation change (,000ha/yr) for repeated clearing events						
	1 st event	2 nd event	3 rd event	4 th event	Total	% of repeat clearing	
1988-91	729.70	0.00	0.00	0.00	729.70	0.00	
1991-95	286.71	3.09	0.00	0.00	289.80	1.07	
1995-97	328.49	11.80	0.00	0.00	340.30	3.47	
1997-99	405.04	20.20	0.07	0.00	425.30	4.76	
1999-2000	709.56	47,93	0.30	0.00	757.78	6.36	
2000-01	338.45	41.45	0.30	0.00	380.20	10.98	
2001-02	428.61	67.95	1.34	0.00	497.90	13.92	
2002-03	510.72	42.40	0.79	0.00	553.91	7,80	
2003-04	410.88	69.21	2.25	0.01	482.36	14.82	
2004-05	290.16	58.50	2.20	0.02	350.88	17.30	
2005-06	328.77	44.47	1.87	0.03	375.13	12.36	
2006-07	206.30	26.96	1.55	0.02	234.83	12.15	
2007-08	105.44	16.19	1.11	0.03	122.78	14.11	
2008-09	84.70	14.41	0.81	0.01	99.94	15.25	

44

Land cover change in Queensland 2008–09

Beverley Henry

Mob: +61 s47F | Email: <u>beverley.henry@</u>s47F

From: Andrew Macintosh

Sent: Friday, 14 December 2018 10:58 AM

To: s22 ; Beverley Henry ; Hilary Smith

Cc: s22

Subject: RE: For consideration: draft notes from teleconference with Devine Agribusiness [SEC=UNCLASSIFIED]

Thanks s22 and co.

The only thing I question is the following:

• Queensland SLATS data also shows repeat clearing occurring. Like the National Accounts data, it shows the majority of clearing in recent years has been repeat clearing. However, it is consistent

with the National Accounts data in showing most land has only been cleared once within the timeframe the ERAC considered.

I thought that was expressed slightly differently = the SLATS data show there is extensive clearing of regrowth but it is not clear whether it also shows that a significant proportion of land that is cleared once (i.e. forest conversion) is subsequently cleared on a cyclical basis.

Other than that, I'm happy for it to be sent to Devine and Kenny after Bev and Hilary provide their comments.

s22

Thanks

Andrew

From: s22	s22	@environment.gov.	<u>au</u> >	
Sent: Thursday,	13 Decembe	er 2018 1:53 PM		
To: Beverley He	nry < <u>beverle</u>	<u>y.henry@</u> s47F	>; Andrew Macintosh < <u>andrew.macintosh@</u> s47F	>; Hilary
Smith < <u>hilary@</u> s	47F	>		
Cc: s22 s22	<u>@env</u>	/ironment.gov.au>		
Subject: For con	cidaration	draft notos from tols	conference with Devine Agribusiness [SEC-UNICLASSIE]	וחב

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We have tried to capture the main points made, and have grouped them by ERAC comments and Devine Agribusiness comments. Please let us know whether you would like any points added, removed or revised.

We will forward the final notes to Dominic and Graham on your behalf.



Thanks

s22

s22

From: Sent: To:	s22 Monday, 17 December 2018 1:38 PM Hilary Smith
Cc: Subject:	s22 FW: For consideration: draft notes from teleconference with Devine Agribusiness [SEC=UNCLASSIFIED]
Attachments:	Consultation_ERAC_Devine Agribusiness_ 11Dec2018_Notes_bh.docx

Hi Hilary

Just checking whether you have any comments to add on the teleconference notes. We have incorporated Beverley's changes.

Thanks

s22

From: Beverley Henry [mailto:beverley.henry@s47F] Sent: Friday, 14 December 2018 1:19 PM To: Andrew Macintosh ; s22 ; Hilary Smith Cc: s22

Subject: RE: For consideration: draft notes from teleconference with Devine Agribusiness [SEC=UNCLASSIFIED]

His22 and all

Thanks for the notes – they are a good record of the discussions.

Like Andrew, I had a suggestion on the dot point on SLATS regrowth clearing. There were also two minor suggested edits – for consideration only.

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Kind regards Beverley



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2000-01	338.45	41.45	0.30	0.00	380.20	10.98
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44

Table 10: Woody vegetation clearing by repeat incidence (1988-2009)

Land cover change in Queensland 2008--09

Beverley	Henry
----------	-------

Mob: s47F

| Email: <u>beverley.henry@</u>s47F

From: Andrew Macintosh <andrew.macintosh@s47F
Sent: Friday, 14 December 2018 10:58 AM
To: s22 s22 @environment.gov.au>; Beverley Henry <beverley.henry@s47F >; Hilary Smith
<hilary@s22 >
Cc: s22 s22 @environment.gov.au>

Subject: RE: For consideration: draft notes from teleconference with Devine Agribusiness [SEC=UNCLASSIFIED]

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S22 Thanks

Andrew

From: s22	s22	@environment.gov	<u>/.au</u> >
Sent: Thursday,	13 Decembe	er 2018 1:53 PM	
To: Beverley He	nry < <u>beverle</u>	<u>y.henry@</u> s47F	>; Andrew Macintosh < <u>andrew.macintosh@</u> s47F >; Hilary
Smith < <u>hilary@</u>	347F	>	
Cc: s22 s22	<u>@env</u>	vironment.gov.au>	
Subject: For con	nsideration: (draft notes from te	leconference with Devine Agribusiness [SEC=UNCLASSIFIED]

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We will forward the final notes to Dominic and Graham on your behalf.



Thanks

s22

FOI 190318 Document 1

s22

s22

From: Maguire, Katrina
Sent: Tuesday, 4 April 2017 5:37 PM
To: 'dominic@devineagribusiness.com.au' ; 'graham.kenny@leichardt.com.au'
Cc: s22 ; s22 @cleanenergyregulator.gov.au'
Subject: Emissions Reduction Fund projects [SEC=UNCLASSIFIED]

Hi Dominic and Graham

I tried to call you this afternoon at your office but understand you are out of town at the moment. I have also left a message on Dominic's mobile. Please find attached a letter relating to Emissions Reduction Fund projects registered under the names of Devine Agribusiness and Oratara Pty Ltd. Contact details for representatives from my Branch and the Clean Energy Regulator are in the attached letter if you'd like to discuss the issue.

Thanks

Katrina Maguire Assistant Secretary Land Branch Domestic Emissions Reduction Division Department of the Environment and Energy

t: 02 6159 7600 e: <u>katrina.maguire@environment.gov.au</u> GPO Box 787 | Canberra ACT 2601 <u>www.environment.gov.au</u>





Australian Government

Department of the Environment and Energy

Mr Dominic Devine dominic@devineagribusiness.com.au

Mr Graham Kenny graham.kenny@leichardt.com.au

Dear Mr Devine and Mr Kenny

I am writing to you in relation to the Emissions Reduction Fund Carbon Credits (Carbon Farming Initiative) (Native Forests from Managed Regrowth) Methodology Determination 2013 and the Full Carbon Accounting Model (FullCAM) guidelines for this method. I am writing to you as contacts for projects under this method registered by Devine Agribusiness Carbon Pty Ltd and Oratara Pastoral Pty Ltd.

The Emissions Reduction Fund is a key part of the Australian Government's plan to reduce Australia's emissions. All projects under the Fund are required to use an approved method. Methods set out the rules for accurately estimating emissions reductions from activities and ensuring emissions reductions are real and would not have occurred in the ordinary course of business. This is required under the *Carbon Credits (Carbon Farming Initiative) Act 2011*. The Department of the Environment and Energy continually reviews the guidelines that support methods to ensure utmost integrity in the Fund.

The Department and the Clean Energy Regulator recently identified an anomaly in the FullCAM guidelines, which could result in overcrediting in some circumstances.

Section 4.18 of the method requires the use of FullCAM to determine the project carbon stocks for a carbon estimation area. Section 4.18 also requires using project-specific inputs as specified in the FullCAM guidelines. Sections 4.19 and 4.22 of the method provide for modelling to cover the period beginning on the day after the last comprehensive clearing before the implementation date. Section 2.4 of the FullCAM guidelines provides for this modelling to estimate carbon sequestration in regrowth occurring since the clearing event. However, the FullCAM guidelines do not provide for the reductions in carbon stocks associated with suppression activities also occurring since the clearing event. This could lead to overcrediting if the FullCAM modelling does not fully reflect the actual events that have occurred prior to the project commencing.

The Department proposes to publish revised FullCAM guidelines to address this anomaly. The proposed revisions ensure abatement estimates accurately reflect the changes in land management required under the method to deliver genuine and additional abatement in accordance with the Act. These proposed revisions are consistent with the provisions in the FullCAM guidelines for the Carbon Credits (Carbon Farming Initiative) (Human-Induced Regeneration of a Permanent Even-Aged Native Forests-1.1) Methodology Determination Variation 2016.

In accordance with the definition of the FullCAM guidelines in the method, the revised guidelines would be applicable to any forthcoming project offsets reports at the time of their submission. The incorporation of documents in methodology determinations as in force from time to time is consistent with subsection 106(8) of the Act.

The proposed revised guidelines are enclosed. The revisions specific to modelling suppression activities are contained in section 3.10.4. The Department is providing the proposed revised guidelines to provide you with the opportunity to comment before a decision is made on whether to proceed with the revisions. Please provide any comments by close of business on Monday 10 April 2017.

The Department and the Clean Energy Regulator would be happy to arrange a time to further discuss this matter with you by telephone. The Department's contact is s22 Director, Forests Section, who can be contacted on s22 or at s22 @environment.gov.au.

s47G				
				The
Clean Energy Re	gulator's contact is s22		Manager, Auctions and Contracts	
Section, who can	be contacted on s22	or at		
s22 @	cleanenergyregulator.gov.au.			

Yours sincerely

Katrina Maguire Assistant Secretary Land Branch 4 April 2017

Enc.

FOI 190318 Document 2



From: Dominic Devine [mailto:dominic.devine@leichardt.com.au] Sent: Thursday, 6 April 2017 3:56 PM To: s22

Subject: Re: Comments on the proposed revision to FullCAM guidelines for the 'Native forest from managed regrowth' method [SEC=UNCLASSIFIED]

Thanks s22

Sent from my iPhone

On 6 Apr 2017, at 3:50 PM, s22 s22 <u>@environment.gov.au</u>> wrote:

Hi Dominic

Thanks for your time this afternoon. As discussed today, I can confirm the Department is willing to accept comments on the proposed revisions to the FullCAM guidelines for the 'Native forest from managed regrowth' method by close of business Thursday 13 April.

As you know, the Department periodically revises FullCAM guidelines for Emissions Reduction Fund methods, to reflect updates to FullCAM and to clarify application of the guidelines where necessary. More broadly, the Department reviews implementation of ERF methods and supporting materials such as FullCAM guidelines on an ongoing basis, to ensure they continue to meet the offsets integrity standards in the legislation. One of the standards particularly relevant to the FullCAM guidelines is ensuring that estimates, projections and assumptions are conservative (paragraph 133(1)(g) of the Act).

We will take your comments into account in making a decision to change to the guidelines as proposed. In the meantime, we will also give some thought to the comments you have already given us by phone.

As discussed yesterday, the Department also intends to include in the revised guidelines a clause to clarify that the changes to the guidelines do not apply to your projects that are already in the audit process.

Once the revised guidelines are published, you are welcome to raise any further comments with us or provide further suggestions that can be taken into account the next time the guidelines are revised.

Regards

s22 Director, Forests Section Domestic Emissions Reduction Division Department of the Environment and Energy T s22 M s22 s22 @environment.gov.au

FOI 190318 - Document 3

s22		
s22	2	
	_	
From: Michael Byrnes Sent: Wednesday, 26 To: s22 Cc: Peter Rowe ; s22 Subject: FW: Devine A [SEC=UNCLASSIFIED]	s [mailto:michaelbyrnes@ April 2017 4:24 PM ; s22 Agribusiness Carbon Pty I	@mrh.com.au] Ltd and Oratara Pastoral Pty Ltd-Revisions of FullCAM Guidelines.
Dear Mr <mark>s</mark> 22 a	nd Mr <mark>s</mark> 22 ,	
We note Mr s22 is o enclosure, in the ever	ut of the office until 28 A at the Department wishe	April 2017. Please see our below email to him with the attached as to consider it prior to Mr <mark>s22</mark> 's return.
Kind regards,		
LAWYERS		
Michael Byrnes Solic MRH Lawyers	itor	
P: 07 3012 6161 E: <u>michaelbymes@mrh.com.</u> www.mrh.com.au	au	
BUNDABERG 74 Woondooma Street P: 07 4154 5563 F: 07 4154 5590	BRISBANE Level 21 345 Queen Street P: 07 3229 1788 F: 07 4154 5590	JOHANNESBURG Block 4, Ground Floor Quadrum Office Park 50 Constantia Boulevard Roodepoort 1709 P: +27 (0) 11 534 8540
Liability limited by a Please Note: 1. The contents of this email ar in error, please contact t 2. This email is also subject to o personal information in t 3. Before opening or using any and /or defects. MRH Se This email message has been so	scheme approved und and any attachments are confidential the sender and then delete the ema copyright. No part of it should be re his email must be handled in accorr attachments, please check them for rvices Pty Ltd should be notified of canned for Viruses and Content and	Pr. +27 (0) 11 534 8401 Per professional standards legislation. I and privileged. Any unauthorised use of the contents is expressly prohibited. If you receive this email ail. eproduced, adapted or communicated without the written consent of the copyright owner. Any dance with the Privacy Act 1988 (Cth) or viruses and defects. The sender does not accept any liability for any damage caused by such viruses any issues on (07) 4154 5500 of any virus and /or defect should you discover same. d cleared by [NetIQ MailMarshal]
From: Michael Byrnes	5	

Sent: Wednesday, 26 April 2017 4:19 PM To: s22 Cc: Peter Rowe

1

Subject: RE: Devine Agribusiness Carbon Pty Ltd and Oratara Pastoral Pty Ltd-Revisions of FullCAM Guidelines. [SEC=UNCLASSIFIED]

Dear Mr s22

Further to the below, please find our correspondence attached.

Kind regards,



P: 07 3012 6161 E: <u>michaelbyrnes@mrh.com.au</u> www.mrh.com.au

BUNDABERG

74 Woondooma Street P: 07 4154 5563 F: 07 4154 5590 BRISBANE Level 21 345 Queen Street P: 07 3229 1788 F: 07 4154 5590

JOHANNESBURG Block 4, Ground Floor Quadrum Office Park 50 Constantia Boulevard Roodepoort 1709 P: +27 (0) 11 534 8540 F: +27 (o) 11 534 8401

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From: s22 [mailtos22 @environment.gov.au]

Sent: Thursday, 13 April 2017 10:46 AM

To: Peter Rowe

Cc: Dominic Devine; Graham Kenny (<u>graham.kenny@leichardt.com.au</u>); Maguire, Katrina; <u>s22</u> **Subject:** RE: Devine Agribusiness Carbon Pty Ltd and Oratara Pastoral Pty Ltd-Revisions of FullCAM Guidelines. [SEC=UNCLASSIFIED]

Dear Mr Rowe

Thank you for your email requesting an extension of time for your clients to provide comments on the Department of the Environment and Energy's proposed changes to the FullCAM guidelines for the *Carbon Credits (Carbon Farming Initiative) (Native Forests from Managed Regrowth) Methodology Determination 2013.*

The Department can provide a further extension of time for submitting comments on the proposed changes. Given the public holidays over the next two weeks, we are willing to accept comments by 11.00 am on Wednesday 26 April 2017.

Regards

s22 Director, Forests Section Domestic Emissions Reduction Division Department of the Environment and Energy T s22 M s22

 From: Peter Rowe [mailto:PeterRowe@mrh.com.au]

 Sent: Wednesday, 12 April 2017 4:14 PM

 To: s22
 s22

 @environment.gov.au>

 Cc: Dominic Devine <dominic.devine@leichardt.com.au>; Graham Kenny (graham.kenny@leichardt.com.au)

 <graham.kenny@leichardt.com.au>

 Subject: Devine Agribusiness Carbon Pty Ltd and Oratara Pastoral Pty Ltd-Revisions of FullCAM Guidelines.

Dear Mr s22,

We act for Devine Agribusiness Carbon Pty Ltd ACN 160 651 052 and Oratara Pastoral Pty Ltd ACN 609 515 808 in relation to various registered projects under the Carbon Credits (Carbon Farming Initiative) Act 2011. We are instructed that the Department proposes to make revisions to the existing FullCAM guidelines upon which our clients' projects have been predicated.

s47G

We note that the Department requires our clients' comments to be submitted by tomorrow, 13 April, 2017. Unfortunately, our clients were only contacted by email just over a week ago.

It would seem in the interests of all parties that comprehensive submissions be made prior to the Department's determination. Accordingly, our clients seek an extension of time for comments to be submitted until Friday 21 April, 2017.

We trust that the Department will give due consideration to this request, given the apparent haste of the revisions s47G In any event, our clients reserve any rights in relation to review of the Department's administrative decisions.

We look forward to your response.

Regards,



Level 21, 345 Queen Street, Brisbane. GPO Box 5017, Brisbane QLD 4001 P: 07 32291788 | F: 07 4154 5592 | E: <u>peterrowe@mrh.com.au</u> www.mrh.com.au

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EMAIL TRANSMISSION

PartnerPeter RoweSolicitorMichael ByrDirect Line07 3229 178Direct Fax07 4151 592E-mailmichaelbyrrOur ReferencePR:MB:773Your Reference

Michael Byrnes 07 3229 1788 07 4151 5929 michaelbyrnes@mrh.com.au PR:MB:773148

26 April 2017

Department of the Environment and Energy c/o Mr s22

Email: s22 @environment.gov.au

Dear Mr s22

LAWYERS Level 21 245 Queen Street Brisbane Qld 4000

GPO Box 5017 BRISBANE QLD 4000 Australia

www.mrh.com.au

ABN 56 185 310 845

PROPOSED AMENDMENT TO FULLCAM GUIDELINES

We act for Devine Agribusiness Carbon Pty Ltd and Oratora Pastoral Pty Ltd. We refer to the Department's correspondence dated 4 April 2017 and subsequent emails with our clients and our office in relation to proposed changes to the Full Carbon Accounting Model guidelines ('FullCAM').

For reference, our clients' statement of the background to this matter is set out in the **enclosed Schedule 1**. We do not propose to improve upon that statement of background. Whilst the statement refers only to Devine Agribusiness Carbon Pty Ltd, please take this also as a reference to the other affected proponent namely Oratara Pastoral Pty Ltd.

Our clients:

- a) thank you for the opportunity to make submissions;
- b) acknowledge the Department's stated wish that neither our clients, nor their existing projects, be prejudiced by the proposed amendments to FullCAM;
- c) acknowledge that the Department intends only to apply the new FullCAM guidelines, once amended, to projects where the audit process has not yet commenced ("the concession");





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Retrospectivity

- 1. Projects for which ACCUs have already been issued to our clients and been sold to the Commonwealth.
 - a. For these projects, audits have of course already been completed and on the face of it the new guidelines would not apply due to the application of the concession.



5. The Guidelines Amendments.

- **a.** Our clients have concerns about the proposed amendments to the guidelines.
- **b.** They understand that for the period for which the amended guidelines may be implemented, the" grazing pause" introduced by those amendments will model a 100% reduction in abatement.
- **c.** This raises the possibility, for example, of a grazing event occurring for a three year period which results in a 20% reduction in actual abatement; however the application of the proposed guidelines would result in a 100% reduction in creditable abatement for that period. This would be an absurd outcome.
- **d.** We are instructed that the fact that the same process is contained within another method does not justify its inclusion into this method. There is nothing to be gained from having an erroneously designed process within both methods as opposed to only one.
- 6. Proposed Solutions.



We look forward to the Department's response. We request the right to make further submissions in response to the Department's initial response and our clients understand the urgency of these issues in that regard.

Please feel free to contact with us to discuss these matters further.

Yours faithfully

Peter Rowe Partner

Schedule 1

Background

- Devine Agribusiness Carbon Pty Ltd ("DAC") is a registered project proponent under the CFI Act.
- DAC has been undertaking registered carbon abatement projects for a number of years.
- DAC holds a number of federal government contracts under the ERF with a combined value of in excess of \$40M to deliver ACCU's from its projects over a ten-year period.
- DAC has entered into a number of contracts with landowners to develop carbon abatement projects their land to deliver ACCU's into the ERF contracts.
- All DAC projects have been developed using the "Native forests from managed regrowth methodology". A methodology co-authored by DAC at an investment of approx. \$900K.
- This methodology requires the use of FullCAM to determine project carbon carbon stocks for each carbon estimation area.
- The Department of Environment and Energy has advised they intend on making significant alterations to the FullCAM guidelines pertaining to this methodology. These alterations are a direct result of errors made by the department when determining the original guidelines.
- The Department is in discussions with DAC on the proposed amendments and has advised that it is the intention that DAC are not disadvantaged by the proposed changes to FullCAM.
- The Department and the CER have further advised that the new FullCAM guidelines will not apply to projects where applications for issuance have already been made to the CER and further projects where the Audit process has commenced using the existing FullCAM guidelines.
- DAC acknowledges that the department is trying to act in good faith and appreciates the opportunity to provide input into this process.



s47G

s22

s22

From: Peter Rowe [mailto:PeterRowe@mrh.com.au]
Sent: Wednesday, 26 April 2017 4:19 PM
To: s22
Cc: Michael Byrnes
Subject: Devine Agribusiness Carbon Pty Ltd and Oratara Pty Ltd- Submissions regarding FullCAM amendments.

Dear Mrs22,

I have just sent through the above submissions on behalf of my clients as named above.

You had asked for submissions by 11.00 am. Unfortunately, although I sent virtually complete submissions to my clients last week, they have been travelling out west and have been difficult to contact. Accordingly, I was only able to finalise their instructions this afternoon.

My apologies for the late lodgement of the submissions. I seek your indulgence to allow the department to take account of those submissions notwithstanding that they were delivered, due to circumstances, after your requested time of 11.00 am today.

Thank you Mr s22 .

Regards,



Level 21, 345 Queen Street, Brisbane. GPO Box 5017, Brisbane QLD 4001 P: 07 32291788 | F: 07 4154 5592 | E: peterrowe@mrh.com.au www.mrh.com.au

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s22

From: s22 Sent: Friday, 19 May 2017 11:21 AM To: 'Peter Rowe' Cc: s47F '; Katrina Maguire ; s22 Subject: RE: Devine Agribusiness Carbon Pty Ltd and Oratara Pastoral Pty Ltd-Revisions of FullCAM Guidelines. [SEC=UNCLASSIFIED]

Dear Mr Rowe

Thank you for your letter of 26 April 2017 on behalf of Devine Agribusiness Carbon Pty Ltd and Oratara Pastoral Pty Ltd concerning the Department of the Environment and Energy's proposed changes to the FullCAM guidelines for the Carbon Credits (Carbon Farming Initiative) (Native Forests from Managed Regrowth) Methodology Determination 2013.

As mentioned in my email to your clients on 6 April 2017, the Department conducts ongoing monitoring and review of existing Emissions Reduction Fund methods as well as the tools and guidelines incorporated in methods by reference. This is an important part of ensuring the continued integrity of the Fund. The Department's work supports the Emissions Reduction Assurance Committee in carrying out its functions under the *Carbon Credits (Carbon Farming Initiative) Act 2011* (CFI Act). These functions include monitoring compliance of methods with the offsets integrity standards in the Act, and undertaking periodic reviews of methods.

The Department uses FullCAM in estimating land sector greenhouse gas emissions as part of the National Greenhouse Accounts prepared in accordance with Australia's international climate change commitments. The methodologies for developing the National Greenhouse Accounts, including FullCAM, need to conform to international guidelines and will continue to be refined as new information emerges and as international practice evolves. Ongoing refinement of FullCAM for international reporting purposes also helps ensure Emissions Reduction Fund methods that use FullCAM continue to meet the offsets integrity standards. Ongoing improvements to the guidelines for using FullCAM for Emissions Reduction Fund methods are necessary to reflect updates to FullCAM as well as feedback from users and findings from the Department's monitoring of implementation.

In monitoring and reviewing Emissions Reduction Fund methods and the supporting tools and information, the Department considers implications for scheme participants, in consultation with the Clean Energy Regulator. The Department values feedback from participants with practical experience in implementing methods, and appreciates your clients' comments on the proposed changes to the Native Forests from Managed Regrowth FullCAM guidelines.

The Department has taken your clients' comments into account in further revising the Native Forests from Managed Regrowth FullCAM guidelines. The revised guidelines are attached. The Department has adopted a revised approach to modelling grazing by livestock, and other disturbance events, as set out in sections 3.10.4 and 3.10.5 of the guidelines. The 'grazing by livestock' event has the effect of applying a reduction to carbon stocks where grazing by livestock has occurred. This reduction is approximately 30 per cent and is supported by recent work undertaken by CSIRO for the Department comparing the carbon stocks between disturbed and undisturbed vegetation in Western NSW and South-West Queensland. Where grazing by livestock ceases, carbon stocks will recover to close to

'undisturbed' levels over a number of years. The 'other disturbances' event applies a growth pause for disturbance events other than grazing by livestock, fire or thinning.

For Native Forest from Managed Regrowth projects subject to grazing by livestock, and which have been issued credits based on undisturbed carbon stock levels under previous versions of the FullCAM guidelines, the effect of the change is that it will take some years for project carbon stocks to surpass previously credited levels. The exact duration will vary according to the years since regeneration for the project. This approach allows for proponents to continue grazing in CEAs and still generate credits, but ensures the impacts of grazing are more accurately accounted for in the modelling. Ensuring FullCAM provides a best estimate is important for the integrity of the method.

The Department has also introduced provisions to the FullCAM guidelines (see section 1.6) which ensure an offsets report submitted before 31 December 2017 that needs to be audited and for which the assurance engagement terms were agreed before 1 May 2017, can use the version of the FullCAM guidelines published on 16 December 2016.

As well as the changes discussed above, we identified some other necessary clarifications in the guidelines, and have incorporated these in the revised version. These include clarifications to reflect the above changes, minor clarifications to explanations, and formatting improvements. For clarity, the attached version highlights all text changes compared to the 16 December 2016 version.

We are happy to consider any comments from your clients on the further revisions to the FullCAM guidelines before finalising them for publication. Please provide any comments by Tuesday 30 May 2017 if possible. We are also happy to discuss with you and your clients the revisions made to the guidelines and any further queries.

Your letter raised a number of questions regarding crediting and provision of information for your clients' existing Native Forest from Managed Regrowth projects. Under the CFI Act, the Department has responsibility for developing and maintaining methods for proponents to use to estimate emissions reductions, whereas the Clean Energy Regulator is responsible for the issuing of Australian Carbon Credit Units on achievement of emissions reductions and compliance with the CFI Act. The Clean Energy Regulator is independent of the Department and operates under the *Clean Energy Regulator Act 2011*. As the questions on crediting and information provision relate to the Clean Energy Regulator's responsibilities, with your agreement we can forward your letter to the Regulator on your behalf. Alternatively, you can submit your queries directly to the Regulator.

Regards

s22 Director, Forests Section Domestic Emissions Reduction Division Department of the Environment and Energy T s22 M s22 s22 @environment.gov.au

From: s47F

@mrh.com.au]

Sent: Wednesday, 26 April 2017 4:19 PM

To: s22 s22 @environment.gov.au>

Cc: Peter Rowe <<u>PeterRowe@mrh.com.au</u>>

Subject: RE: Devine Agribusiness Carbon Pty Ltd and Oratara Pastoral Pty Ltd-Revisions of FullCAM Guidelines. [SEC=UNCLASSIFIED]

Dear Mr s22,

Further to the below, please find our correspondence attached.

Kind regards,





BUNDABERG 74 Woondooma Street P: 07 4154 5563 F: 07 4154 5590

Level 21 345 Queen Street P: 07 3229 1788 F: 07 4154 5590

BRISBANE

JOHANNESBURG Block 4, Ground Floor Quadrum Office Park 50 Constantia Boulevard Roodepoort 1709 P: +27 (0) 11 534 8540 F: +27 (o) 11 534 8401

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From: s22 [mailtos22 @environment.gov.au]

Sent: Thursday, 13 April 2017 10:46 AM

To: Peter Rowe

Cc: Dominic Devine; Graham Kenny (<u>graham.kenny@leichardt.com.au</u>); Maguire, Katrina; <u>s22</u> **Subject:** RE: Devine Agribusiness Carbon Pty Ltd and Oratara Pastoral Pty Ltd-Revisions of FullCAM Guidelines. [SEC=UNCLASSIFIED]

Dear Mr Rowe

Thank you for your email requesting an extension of time for your clients to provide comments on the Department of the Environment and Energy's proposed changes to the FullCAM guidelines for the *Carbon Credits (Carbon Farming Initiative) (Native Forests from Managed Regrowth) Methodology Determination 2013.*

The Department can provide a further extension of time for submitting comments on the proposed changes. Given the public holidays over the next two weeks, we are willing to accept comments by 11.00 am on Wednesday 26 April 2017.

Regards

s22 Director, Forests Section Domestic Emissions Reduction Division Department of the Environment and Energy T s22 M s22 s22 @environment.gov.au

From: s47F @mrh.com.au]

Sent: Wednesday, 12 April 2017 4:14 PM To: s22 s22 @environment.gov.au>

Cc: Dominic Devine <<u>dominic.devine@leichardt.com.au</u>>; Graham Kenny (<u>graham.kenny@leichardt.com.au</u>) <<u>graham.kenny@leichardt.com.au</u>>

Subject: Devine Agribusiness Carbon Pty Ltd and Oratara Pastoral Pty Ltd-Revisions of FullCAM Guidelines.

Dear Mr s22,

We act for Devine Agribusiness Carbon Pty Ltd ACN 160 651 052 and Oratara Pastoral Pty Ltd ACN 609 515 808 in relation to various registered projects under the Carbon Credits (Carbon Farming Initiative) Act 2011. We are instructed that the Department proposes to make revisions to the existing FullCAM guidelines upon which our clients' projects have been predicated.



We note that the Department requires our clients' comments to be submitted by tomorrow, 13 April, 2017. Unfortunately, our clients were only contacted by email just over a week ago.

It would seem in the interests of all parties that comprehensive submissions be made prior to the Department's determination. Accordingly, our clients seek an extension of time for comments to be submitted until Friday 21 April, 2017.

We trust that the Department will give due consideration to this request, given the apparent haste of the revisions s47G In any event, our clients reserve

any rights in relation to review of the Department's administrative decisions.

We look forward to your response.

Regards,



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FOI 190318 Document 6



From: s22 Sent: Thursday, 25 May 2017 5:45 PM To: 'Peter Rowe' Cc: 'michaelbyrnes@mrh.com.au' ; Katrina Maguire ; s22 Subject: FW: Devine Agribusiness Carbon Pty Ltd and Oratara Pastoral Pty Ltd-Revisions of FullCAM Guidelines. [SEC=UNCLASSIFIED]

Dear Mr Rowe

I am writing in relation to the revised FullCAM guidelines for the *Carbon Credits (Carbon Farming Initiative) (Native Forests from Managed Regrowth) Methodology Determination 2013* provided in my email of 19 May 2017, and the Department's request for comments by 30 May 2017. As indicated to Mr Dominic Devine and Mr Graham Kenny by telephone on 24 May, I wish to advise that the Department is no longer seeking comments by 30 May 2017 on the version of the guidelines sent to you last week.

Your clients provided initial feedback by telephone on 19 and 22 May regarding the Department's revised approach to modelling the effects of livestock grazing. The Department has reviewed the proposed approach based on this feedback. In discussing the matter with your clients on 24 May, we indicated that we intended to further consider a suitable approach, taking into account their feedback together with the requirements of the method.

The Department appreciates the constructive input from your clients and their offer to work further with the Department on developing a suitable approach.

Your clients sought an indication from the Department of timing for a decision on a revision to the Guidelines, and also requested an assurance that the Department would provide final draft guidelines for comment at least 14 days before the revised guidelines are published. The Department will provide further advice on expected timing as soon as possible.

I have also emailed your clients following our discussion with them yesterday.

Regards

s22 Director, Forests Section Domestic Emissions Reduction Division Department of the Environment and Energy T s22 M s22 s22 @environment.gov.au

@environment.gov.au>

Subject: RE: Devine Agribusiness Carbon Pty Ltd and Oratara Pastoral Pty Ltd-Revisions of FullCAM Guidelines. [SEC=UNCLASSIFIED]

Dear Mr Rowe

Thank you for your letter of 26 April 2017 on behalf of Devine Agribusiness Carbon Pty Ltd and Oratara Pastoral Pty Ltd concerning the Department of the Environment and Energy's proposed changes to the FullCAM guidelines for the Carbon Credits (Carbon Farming Initiative) (Native Forests from Managed Regrowth) Methodology Determination 2013.

As mentioned in my email to your clients on 6 April 2017, the Department conducts ongoing monitoring and review of existing Emissions Reduction Fund methods as well as the tools and guidelines incorporated in methods by reference. This is an important part of ensuring the continued integrity of the Fund. The Department's work supports the Emissions Reduction Assurance Committee in carrying out its functions under the *Carbon Credits (Carbon Farming Initiative) Act 2011* (CFI Act). These functions include monitoring compliance of methods with the offsets integrity standards in the Act, and undertaking periodic reviews of methods.

The Department uses FullCAM in estimating land sector greenhouse gas emissions as part of the National Greenhouse Accounts prepared in accordance with Australia's international climate change commitments. The methodologies for developing the National Greenhouse Accounts, including FullCAM, need to conform to international guidelines and will continue to be refined as new information emerges and as international practice evolves. Ongoing refinement of FullCAM for international reporting purposes also helps ensure Emissions Reduction Fund methods that use FullCAM continue to meet the offsets integrity standards. Ongoing improvements to the guidelines for using FullCAM for Emissions Reduction Fund methods are necessary to reflect updates to FullCAM as well as feedback from users and findings from the Department's monitoring of implementation.

In monitoring and reviewing Emissions Reduction Fund methods and the supporting tools and information, the Department considers implications for scheme participants, in consultation with the Clean Energy Regulator. The Department values feedback from participants with practical experience in implementing methods, and appreciates your clients' comments on the proposed changes to the Native Forests from Managed Regrowth FullCAM guidelines.

The Department has taken your clients' comments into account in further revising the Native Forests from Managed Regrowth FullCAM guidelines. The revised guidelines are attached. The Department has adopted a revised approach to modelling grazing by livestock, and other disturbance events, as set out in sections 3.10.4 and 3.10.5 of the guidelines. The 'grazing by livestock' event has the effect of applying a reduction to carbon stocks where grazing by livestock has occurred. This reduction is approximately 30 per cent and is supported by recent work undertaken by CSIRO for the Department comparing the carbon stocks between disturbed and undisturbed vegetation in Western NSW and South-West Queensland. Where grazing by livestock ceases, carbon stocks will recover to close to 'undisturbed' levels over a number of years. The 'other disturbances' event applies a growth pause for disturbance events other than grazing by livestock, fire or thinning.

For Native Forest from Managed Regrowth projects subject to grazing by livestock, and which have been issued credits based on undisturbed carbon stock levels under previous versions of the FullCAM guidelines, the effect of the change is that it will take some years for project carbon stocks to surpass previously credited levels. The exact duration will vary according to the years since regeneration for the project. This approach allows for proponents to continue grazing in CEAs and still generate credits, but ensures the impacts of grazing are more accurately accounted for in the modelling. Ensuring FullCAM provides a best estimate is important for the integrity of the method.

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As well as the changes discussed above, we identified some other necessary clarifications in the guidelines, and have incorporated these in the revised version. These include clarifications to reflect the above changes, minor clarifications to explanations, and formatting improvements. For clarity, the attached version highlights all text changes compared to the 16 December 2016 version.

We are happy to consider any comments from your clients on the further revisions to the FullCAM guidelines before finalising them for publication. Please provide any comments by Tuesday 30 May 2017 if possible. We are also happy to discuss with you and your clients the revisions made to the guidelines and any further queries.

Your letter raised a number of questions regarding crediting and provision of information for your clients' existing Native Forest from Managed Regrowth projects. Under the CFI Act, the Department has responsibility for developing and maintaining methods for proponents to use to estimate emissions reductions, whereas the Clean Energy Regulator is responsible for the issuing of Australian Carbon Credit Units on achievement of emissions reductions and compliance with the CFI Act. The Clean Energy Regulator is independent of the Department and operates under the *Clean Energy Regulator Act 2011*. As the questions on crediting and information provision relate to the Clean Energy Regulator's responsibilities, with your agreement we can forward your letter to the Regulator on your behalf. Alternatively, you can submit your queries directly to the Regulator.

Regards

s22 Director, Forests Section Domestic Emissions Reduction Division Department of the Environment and Energy T s22 M s22 s22 @environment.gov.au

 From: Michael Byrnes [mailto:michaelbyrnes@mrh.com.au]

 Sent: Wednesday, 26 April 2017 4:19 PM

 To: s22
 @environment.gov.au

 Cc: Peter Rowe < PeterRowe@mrh.com.au</td>

Subject: RE: Devine Agribusiness Carbon Pty Ltd and Oratara Pastoral Pty Ltd-Revisions of FullCAM Guidelines. [SEC=UNCLASSIFIED]

Dear Mrs22,

Further to the below, please find our correspondence **attached**.

Kind regards,



P: 07 3012 6161 E: michaelbyrnes@mrh.com.au www.mrh.com.au

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From: s22

@environment.gov.au

Sent: Thursday, 13 April 2017 10:46 AM

To: Peter Rowe

Cc: Dominic Devine; Graham Kenny (<u>graham.kenny@leichardt.com.au</u>); Maguire, Katrina; <u>s22</u> **Subject:** RE: Devine Agribusiness Carbon Pty Ltd and Oratara Pastoral Pty Ltd-Revisions of FullCAM Guidelines. [SEC=UNCLASSIFIED]

Dear Mr Rowe

Thank you for your email requesting an extension of time for your clients to provide comments on the Department of the Environment and Energy's proposed changes to the FullCAM guidelines for the *Carbon Credits (Carbon Farming Initiative) (Native Forests from Managed Regrowth) Methodology Determination 2013.*

The Department can provide a further extension of time for submitting comments on the proposed changes. Given the public holidays over the next two weeks, we are willing to accept comments by 11.00 am on Wednesday 26 April 2017.

Regards

s22

Director, Forests Section Domestic Emissions Reduction Division Department of the Environment and Energy T s22 M s22 s22 @environment.gov.au

From: Peter Rowe [mailto:PeterRowe@mrh.com.au] Sent: Wednesday, 12 April 2017 4:14 PM

To: s22 @environment.gov.au>

Cc: Dominic Devine <<u>dominic.devine@leichardt.com.au</u>>; Graham Kenny (<u>graham.kenny@leichardt.com.au</u>) <<u>graham.kenny@leichardt.com.au</u>>

Subject: Devine Agribusiness Carbon Pty Ltd and Oratara Pastoral Pty Ltd-Revisions of FullCAM Guidelines.

Dear s22

We act for Devine Agribusiness Carbon Pty Ltd ACN 160 651 052 and Oratara Pastoral Pty Ltd ACN 609 515 808 in relation to various registered projects under the Carbon Credits (Carbon Farming Initiative) Act 2011. We are instructed that the Department proposes to make revisions to the existing FullCAM guidelines upon which our clients' projects have been predicated.



We note that the Department requires our clients' comments to be submitted by tomorrow, 13 April, 2017. Unfortunately, our clients were only contacted by email just over a week ago.

It would seem in the interests of all parties that comprehensive submissions be made prior to the Department's determination. Accordingly, our clients seek an extension of time for comments to be submitted until Friday 21 April, 2017.

We trust that the Department will give due consideration to this request, given the apparent haste of the revisions s47G In any event, our clients reserve any rights in relation to review of the Department's administrative decisions.

We look forward to your response.

Regards,



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s22 From: s22 Sent: Thursday, 25 May 2017 5:33 PM To: 'dominic@devineagribusiness.com.au'; Graham Kenny (graham.kenny@leichardt.com.au) Cc: s22 Subject: Revision of Native Forest from Managed Regrowth FullCAM guidelines: follow-up to telephone discussions [SEC=UNCLASSIFIED]

Dear Dominic and Graham

Thanks for your time on the phone yesterday, as well as last Friday and Monday. We appreciate your feedback and advice and your offer to continue to work with the Department on a suitable way to deal with the effects of grazing in the FullCAM guidelines for the Native Forest from Managed Regrowth method. As discussed yesterday, we will do some more work on an approach that takes your advice into account, and will come back to you for further advice.

I will also email Peter Rowe to formally advise we are no longer seeking comments on the version of the guidelines I sent last Friday and that we will provide further advice on timing as soon as possible.

Regards

s22

Director, Forests Section Domestic Emissions Reduction Division Department of the Environment and Energy T s22 M s22 s22 @environment.gov.au



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Dear Dominic and Graham

c22

I am following up on our previous discussions and correspondence about dealing with the effects of grazing in the FullCAM guidelines for the Native Forest from Managed Regrowth method. Thanks for your patience while we have been working on this since our conversation on 25 May. Dominic, I tried to call you earlier this week.

As discussed on 25 May, we have looked at a revised approach involving modelling a growth pause in circumstances where suppression such as grazing has a material effect on carbon stocks. In doing this, we have kept in mind concepts raised in our discussions with you, including ways to determine materiality and the effects different animal types have on different plants. We have done this in consultation with the Clean Energy Regulator, including to consider auditability aspects. As you suggested, we have also looked at the literature on vegetation systems and interactions with livestock and other management in southwest Queensland.

After looking at possible approaches closely, we have determined that there isn't currently a practical way to define a growth pause event representing material effects of suppression (particularly any historical effects) for the FullCAM guidelines for the Native Forest from Managed Regrowth method. We have not identified other modelling approaches for representing effects of suppression under this method either. Therefore we won't be amending the FullCAM guidelines at present.

As discussed in May, some aspects of the matters we've looked at with you in relation to the FullCAM guidelines may also be relevant to the Native Forest from Managed Regrowth method itself. Our discussions with you will help inform the Department's ongoing monitoring and review of the method.

If necessary, I would be happy to email Peter Rowe to advise him of this outcome.

Thanks again for taking the time to work through this issue with us and for your responsive and constructive advice. I will be out of the office for the rest of this week and next week. If you would like to discuss any aspects further, and I would be happy to do this when I get back, or otherwise s22 will be available this week and next week.

Regards

s22

Director, Forests Section Domestic Emissions Reduction Division Department of the Environment and Energy T s22 M s22 s22 @environment.gov.au

FOI 190318	
Document 9	

From:	s22
Sent:	Tuesday, 12 December 2017 5:18 PM
То:	'graham.kenny@leichardt.com.au'; 'dominic@devineagribusiness.com.au'
Cc:	s22 ; s22 ; s22
Subject:	FullCam guidelines [SEC=UNCLASSIFIED]

Hi Dominic and Graham

Would you have time in the next couple of days for us to give you a call to discuss some changes we are making to the FullCam Guidelines for new projects under the Native Forest from Managed Regrowth method? These changes are designed to address some specific concerns the Emissions Reduction Assurance Committee (ERAC) have about the time period for modelling regeneration prior to project registration. The ERAC review of both the NFMR and Human Induced Regeneration methods that I mentioned yesterday at the meeting with the Clean Energy Regulator will look more broadly to ensure both methods continue to meet all the offsets integrity standards.

Thanks Katrina

Katrina Maguire Assistant Secretary Land and Outreach Branch Climate Change Division Department of the Environment and Energy

t: 02 6159 7600 | m: s47F e: katrina.maguire@environment.gov.au GPO Box 787 | Canberra ACT 2601 www.environment.gov.au





An Australian Government Initiative

FOI 190318	
Document 10	

From:	Erfforests
Sent:	Wednesday, 13 December 2017 4:20 PM
To:	Dominic Devine
Cc:	Graham Kenny (graham.kenny@leichardt.com.au); Maguire, Katrina; s22
Subject: Attachments:	s22 For comment: NFMR FullCAM Guidelines changes [SEC=UNCLASSIFIED] FullCAM_2017 Guidelines update_NFMR (131217).docx

Dear Dominic

Thank you for your time on the phone today. We certainly found it a very helpful conversation and look forward to learning more about your projects in the new year.

As we noted, the Department intends to implement a change to the Native Forest from Managed Regrowth Method FullCAM Guidelines. The change will only apply to new projects and areas.

Under the FullCAM Guidelines update, project proponents will model the regeneration event in the project carbon scenario as commencing no more than 14 years prior to the project registration date.

The change ensures consistency with the method's default baseline assumption that the land would be cleared again after 14 years of regrowth for pastoral purposes.

The change is intended to apply to projects registered from today onwards, and new areas added to existing projects from today onwards. Existing projects will be unaffected aside from any new areas that are added. The Department intends to publish the change to the Guidelines by 22 December 2017. If you wish to make any comment, please reply to the Department by COB 20 December.

For your convenience, changes from the latest public version of the Guidelines are included in track in the attachment. There are also a number of minor editing changes, including changes to better express the timing of windrow and burn and management fire events. Some of these changes were contained within the draft version of the Guidelines that you were consulted on earlier in the year. The update also includes references to the requirements around the timing of the regeneration event that are contained within the Method.

I'm happy to talk you through any of the changes at any time if you wish to get in contact using the below details.

Regards

s22

Forests Section | Land & Outreach Branch

Climate Change Division | Department of the Environment and Energy

ps22 | es22 @environment.gov.au | m PO Box 787 ACT 2601

From:	Katrina Maguire
Sent:	Monday, 18 December 2017 2:16 PM
To:	'Dominic Devine'; 'graham.kenny@leichardt.com.au'
Cc:	s22 ; s22
Subject:	RE: Review of NFMR FullCAM Guidelines [SEC=UNCLASSIFIED]

Hi Dominic and Graham

s22 has spoken to Graham and explained the 14 years is the start of regeneration, not the date of last clearing.^{s47G} S47G

s47G I know you'd prefer us not to make the change at all, including on principle, in advance of the review and we will ensure ERAC are aware of your concerns.

Thanks Katrina

From: Dominic Devine [mailto:dominic.devine@leichardt.com.au]
Sent: Friday, 15 December 2017 4:46 PM
To: Maguire, Katrina
Subject: Fwd: Review of NFMR FullCAM Guidelines

Dear Katrina,

In following up our call earlier today following are the details you requested s47G



s47G

Regards

Dominic Devine Devine Agribusiness Carbon Pty. Ltd. M: \$47F GPO Box 948, Brisbane Qld 4001

From:	s22
Sent:	Friday, 9 February 2018 11:13 AM
То:	Dominic Devine
Cc:	s22 s22
Subject:	Update on planned visit to projects near St George [SEC=UNCLASSIFIED]

Hi Dominic

Just letting you know we are making progress on plans to come to Queensland, and the week starting 5 March looks like it will work.

Last time we spoke, we were looking at arriving in St George early in the week. Before we go any further with arrangements, I wanted to check whether later in the week would also suit you. This could mean either: arriving in St George late on Tuesday 6 March, visiting projects with you on the Wednesday and then leaving St George for Canberra on the Thursday; or arriving on Wednesday, visiting properties on Thursday and leaving on Friday.

The reason for looking at the different dates is that we are looking at flying into or out of Roma instead of St George, because the daily flights to both Roma and Charleville give us more flexibility at either end of the trip.

I look forward to hearing from you. We should then be able to confirm plans for the trip fairly soon.

Thanks

s22 Director, Forests Section Climate Change Division Department of the Environment and Energy T s22 M s22 s22 @environment.gov.au FOI 190318 Document 13

s22

Erfforests
Tuesday, 20 February 2018 10:39 AM
'dominic.devine@leichardt.com.au'
'graham.kenny@leichardt.com.au'
Invitation to Emissions Reduction Fund workshop [SEC=UNCLASSIFIED]

Dear Domenic,

Following on from recent discussions I'm writing to invite you to a workshop in Charleville on Tuesday 6 March regarding the Emissions Reduction Fund.

The workshop is being held by the Emissions Reduction Assurance Committee. You've been invited because you have an interest in the two 'methods' being reviewed by Committee:

- Native Forest from Managed Regrowth
- Human-Induced Regeneration of a Permanent Even Aged Native Forest.

The Committee wants to hear from people with knowledge and practical experience in land management as well as direct experience in running projects.

Together with staff from the Department of the Environment and Energy and the Clean Energy Regulator, the Committee is seeking the views of landholders, carbon service providers, local councils, NRM groups and other local community members to better understand how the methods are being implemented and inform the Committee's reviews of these methods. The workshop will also provide an opportunity for you to ask questions of representatives from the Committee, the Department and Regulator about the methods and the reviews.

Details of the workshop are below:

- Location: Charleville RSL, Cnr Watson and River Street, Charleville
- Day and time: Tuesday 6 March, 1-4pm (lunch will be provided from 12pm)

Please let me know by **Tuesday 27 February** whether or not you plan to attend or send someone on your behalf. Could you also please advise of any dietary requirements, and whether you intend to come for lunch. In addition, if there are others with experience of the methods or an informed view whom you believe should participate, I'd appreciate their names, interest and contact details.

Kind regards,

s22

FOI 190318 Document 14

s22

From:	s22
Sent:	Friday, 6 July 2018 4:35 PM
То:	'dominic.devine@leichardt.com.au'
Cc:	Maguire, Katrina; s22
Subject:	Proposed CFI Rule Amendment regarding forest cover attainment [SEC=UNCLASSIFIED]
Attachments:	Consultation_ERAC summary_workshop_180704.docx; Rule amendment_forest cover achievement.docx; CERSydney workshop_Legislative rule change_data_ 030718.docx

Hello Dominic

Thank you for your time on the phone this afternoon. As discussed, please find attached the draft CFI rule amendment concerning the attainment of forest cover within regeneration projects together with supporting data and the ERAC position summary. These documents were presented to stakeholders at Wednesday's workshop in Sydney. §42

Regards

s22

 Forests Section | Land & Outreach Branch

 Climate Change Division | Department of the Environment and Energy

 p s22
 @environment.gov.au | m PO Box 787 ACT 2601



From:	Graham Kenny <graham.kenny@leichardt.com.au></graham.kenny@leichardt.com.au>
Sent:	Monday, 30 July 2018 4:18 PM
То:	s22 ; Maguire, Katrina
Cc:	Dominic Devine
Subject:	RE: Phone call with ERAC members tomorrow [SEC=UNCLASSIFIED]
Attachments:	DACarbon Draft Position Paper - Proposed CFI rule change July 2018.pdf

Dear s22 and Katrina,

We attach our draft position paper containing some points for discussion on tomorrows call.

Regards

Graham Kenny Devine Agribusiness Carbon Pty. Ltd.

graham.kenny@leichardt.com.au T: 07 3226 7777 GPO Box 948, Brisbane Qld 4001 Level 22, 127 Creek Street, Brisbane Qld 4000

From: s22 Sent: Monday, 30 July 2018 2:17 PM To: Dominic Devine Cc: Graham Kenny Subject: RE: Phone call with ERAC members tomorrow [SEC=UNCLASSIFIED]

Thanks Dominic.

From: Dominic Devine [mailto:dominic.devine@leichardt.com.au]
Sent: Monday, 30 July 2018 2:06 PM
To: s22 s22 <u>@environment.gov.au</u> >
Cc: Graham Kenny <graham.kenny@leichardt.com.au></graham.kenny@leichardt.com.au>
Subject: Re: Phone call with ERAC members tomorrow [SEC=UNCLASSIFIED]
Sounds good s22
Sent from my iPhone
On 30 Jul 2018, at 1:29 pm, s22 s22 <u>@environment.gov.au</u> > wrote:
Hi Dominic
Would you be available for a phone call with ERAC members and the Department at 12.2 tomorrow?
The ERAC members will be Andrew Macintosh, Hilary Smith and Beverley Henry
We can call you.

Thanks

Director, Forests Section Climate Change Division Department of the Environment and Energy T s22 M s22 s22 @environment.gov.au

FOI 190318 Document 16

s22

From:	s22
Sent:	Monday, 30 July 2018 5:41 PM
То:	'Graham Kenny'; Maguire, Katrina
Cc:	Dominic Devine
Subject:	RE: Phone call with ERAC members tomorrow [SEC=UNCLASSIFIED]

Thanks Graham. We'll look forward to speaking with you tomorrow.

Regards

 s22

 Director, Forests Section

 Climate Change Division

 Department of the Environment and Energy

 T s22
 M s22

 s22
 @environment.gov.au

From: Graham Kenny [mailto:graham.kenny@leichardt.com.au]
Sent: Monday, 30 July 2018 4:18 PM
To: s22 ; Maguire, Katrina
Cc: Dominic Devine
Subject: RE: Phone call with ERAC members tomorrow [SEC=UNCLASSIFIED]

Dear s22 and Katrina,

We attach our draft position paper containing some points for discussion on tomorrows call.

Regards

Graham Kenny Devine Agribusiness Carbon Pty. Ltd.

graham.kenny@leichardt.com.au T: 07 3226 7777 GPO Box 948, Brisbane Qld 4001 Level 22, 127 Creek Street, Brisbane Qld 4000

 From: s22
 s22
 @environment.gov.au>

 Sent: Monday, 30 July 2018 2:17 PM

 To: Dominic Devine <dominic.devine@leichardt.com.au>

 Cc: Graham Kenny <graham.kenny@leichardt.com.au>

 Subject: RE: Phone call with ERAC members tomorrow [SEC=UNCLASSIFIED]

Thanks Dominic.

 From: Dominic Devine [mailto:dominic.devine@leichardt.com.au]

 Sent: Monday, 30 July 2018 2:06 PM

 To: s22
 s22

 @environment.gov.au>

 Cc: Graham Kenny <graham.kenny@leichardt.com.au>

 Subject: Re: Phone call with ERAC members tomorrow [SEC=UNCLASSIFIED]

Sounds good s22

On 30 Jul 2018, at 1:29 pm, s22 s22 <u>@environment.gov.au</u>> wrote:

Hi Dominic

Would you be available for a phone call with ERAC members and the Department at 12.15 tomorrow?

The ERAC members will be Andrew Macintosh, Hilary Smith and Beverley Henry

We can call you.

Thanks

s22 Director, Forests Section Climate Change Division Department of the Environment and Energy T s22 M s22 s22 @environment.gov.au



From:	s22
Sent:	Friday, 3 August 2018 5:02 PM
То:	Dominic Devine; 'Graham Kenny'
Cc:	Maguire, Katrina
Subject:	Emissions Reduction Assurance Committee review of Native Forest from Managed Regrowth method - further information [SEC=UNCLASSIFIED]

Dear Dominic and Graham

Thank you for making time to speak with Andrew Macintosh, Chair of the Emissions Reduction Assurance Committee (ERAC), Committee members Beverley Henry and Hilary Smith, and the Department on Tuesday. As requested, the following is further information on the evidence the Committee has considered.

The Department is available to meet with any of your clients or other people involved in your projects to explain how the rule would apply if you wish. The Chair of the ERAC has also asked that we reiterate his offer to talk again should you wish to do so.

Background

In the papers the Department circulated for the 4 July 2018 meeting in Sydney, we provided amalgamated data on the extent of vegetation cover within both Human-Induced Regeneration (HIR) and Native Forest from Managed Regrowth (NFMR) projects that have reported. We chose not to separate out data for the two methods to avoid allowing data to be attributed to your portfolio. The extent of vegetation cover was determined by overlaying the Department's vegetation cover layers (aka NCAS data) over the carbon estimation areas (CEAs) known from submitted reports. The NFMR project data are in the first table below.

As you are aware, the ERAC is reviewing whether the NFMR and HIR methods continue to meet the offsets integrity standards in the *Carbon Farming Initiative Act 2011*. The Committee's sources of information include data from project offsets reports that you have provided to the Clean Energy Regulator. The second table below lists the relevant NFMR projects. The Clean Energy Regulator has provided this information to the Committee and the Department in accordance with the information disclosure provisions of the *Clean Energy Regulator Act 2011*.

One of the offsets integrity standards requires methods to apply conservative estimates, projections and assumptions. In reviewing the methods against this standard, the Committee has been considering whether the method ensures the estimates of sequestration derived from FullCAM adequately (and conservatively) reflect the actual sequestration achieved in the CEAs. As the Chair of the ERAC stated on Tuesday, the ERAC has concerns about the potential for over-crediting and forward crediting due to the way FullCAM is applied in the method. In forming its views on this issue, the ERAC has relied on a number of different types and sources of information, including conceptual information on the requirements of the method, project data, spatial data from the Department on changes in vegetation cover extent in CEAs, and data from CSIRO and s22 on relationships between tree biomass and crown cover.

Data summary



Biomass to canopy cover data compiled by s22 and CSIRO suggest forest cover is attained in regenerating forest systems when approximately 5 tonnes of carbon has accumulated in trees and debris per hectare. The FullCAM model predicts this level is reached in areas where NFMR projects are currently located after 10-20 years of modelled regeneration.

s47G

The proposed rule is designed to test existing projects for the presence of forest cover 15 years from the project registration date. As NFMR projects were registered as early as 2014, this would mean the proposed Rule amendment would first apply to existing NFMR projects in 2029. **s**47C

To illustrate how the proposed Rule amendment would apply, a typical existing project registered in 2015, that modelled regeneration commencing in 2000 and which has been unhindered by any modelled disturbances or suppression, would be first tested for whether the CEA has developed forest cover between 2030 and 2035 (noting there is up to 5 years from the previous reporting period to submit the next offsets report, at which time the test occurs). As CSIRO and <u>s22</u> work suggests FullCAM is modelling regeneration occurring at a rate where forest cover is reached after 10-20 years, the test would apply at a time well beyond this period.

The Committee is aware of the limitations in interpreting remote sensing data, and has used the vegetation cover data for the purpose of considering the adequacy of the requirements in the methods for ensuring crediting of abatement appropriately reflects actual abatement.



NFMR projects considered

Projects examined
EOP100508
EOP100868
EOP100932
EOP100933
EOP100934
EOP100936
EOP100969
EOP100971
ERF101472
ERF101475
ERF101942
ERF102124

Regards

s22 Director, Forests Section Climate Change Division Department of the Environment and Energy T s22 M s22 s22 @environment.gov.au FOI 190318 Document 18

s22

s22
Friday, 17 August 2018 3:18 PM
'dominic.devine@leichardt.com.au'; 'graham.kenny@leichardt.com.au'
s22 s22 ; Maguire, Katrina
Biomass to canopy cover report and data [SEC=UNCLASSIFIED]
Final report - Stand biomass and canopy cover_8Aug18-v2.docx

Hello Dominic and Graham

Thanks for your time again yesterday. As requested, I've attached the CSIRO Report on the canopy cover to biomass relationship, along with the entirety of the data received from **s22** below, beginning with the data previously emailed through and provided at the Regulator workshop last month. Note that the CSIRO Report has only been finalised in recent days following peer review comments, including from **s22**, and has not yet been circulated to other stakeholders. The timing element of the draft rule amendment is driven by when FullCAM estimates biomass has attained levels where the relationship to canopy cover suggests forest cover would be present if on-ground regrowth matched the estimates.

Happy to talk you through any of this information at any point.

Regards

 S22

 Forests Section | Land & Outreach Branch

 Climate Change Division | Department of the Environment and Energy

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 @environment.gov.au | m PO Box 787 ACT 2601

<u>Canopy cover to biomass data from s22</u> (provided at the CER Workshop 4/7/18 and to Devine 6/7/18)

Figure 1. Relationship between above and below ground live tree biomass (tonnes per hectare dry weight equivalent), canopy cover (as percentage) and height (metres) for 110 sites in southern and central Queensland including brigalow (open circles), mulga (triangles) and poplar box (crosses)



Source: s22 , unpublished work using Biomass Plot Library data (accessible at <u>http://data.auscover.org.au/xwiki/bin/view/Product+pages/Biomass+Plot+Library</u>), 2018.

- This figure incorporates data from brigalow (71 sites), mulga (30 sites) and poplar box (9 sites).
- The entire dataset doesn't suggest significant differences among dominant species in terms of the relationship between stand biomass, height and cover.

Figure 2. Relationship between live tree biomass (above and below ground tonnes per hectare dry weight equivalent) and canopy cover for 3 subset height classes



Source: s22 , unpublished work using Biomass Plot Library data (accessible at <u>http://data.auscover.org.au/xwiki/bin/view/Product+pages/Biomass+Plot+Library</u>), 2018.

- Statistical modelling of live tree biomass versus height and canopy cover for three subset height classes suggests that regrowth 2.5 metres tall and providing 25 percent canopy cover (i.e. generous view of the forest cover threshold) would rarely be expected to exceed 5.2 tonnes per hectare of live tree biomass (silver highlight shows upper confidence interval for model fit).
- 5.2 tonnes per hectare of live tree biomass translates to 3.6 tonnes of carbon per hectare in the FullCAM trees and debris pools (5.2 tonnes of biomass per hectare figure multiplied by 0.49 to convert biomass to carbon, and then multiplied by 1.43 to convert tree carbon to tree and debris carbon based on FullCAM ratios).

Further graph provided by s22

Following the Workshop **s22** consolidated the data into this graph that he provided through, noting that a colleague had checked the model and came up with similar figures.



Original email with data from s22

Below is the original email provided by **s22** that was drawn upon for the data provided and explained at the Regulator Workshop, which **s22** also attended.

I've had a look through some stand level data for regrowth in southern and central Qld (110 sites from brigalow (71 sites, open circles in plot below), mulga (30 sites, triangles below) and poplar box (9 sites, + below)). An analysis of the entire dataset doesn't suggest significant differences among dominant species in terms of the relationship between stand biomass, height and cover.



Basic statistical modelling of biomass vs. height and cover for a subset of 33 sites with height under 4m and cover less than 40% suggest that regrowth 2.5m tall and 25% cover (i.e. a generous view of the forest threshold) would probably have about 4.7 t/ha of living biomass in trees, and would rarely be expected to exceed 6.2 t/ha (dashed line showing upper confidence interval for model fit). 6.2 t/ha of biomass translates to about 11 t CO2-e.



For comparison, an exponential fit through the whole dataset of 110 sites suggests tree biomass for 2.5m height and 25% cover is likely to be closer to 2 t/ha (interval 1.5-2.8 t/ha) but this is strongly influenced by the data well above the forest threshold, which is why I ran a more limited analysis on a subset with lower cover and height and forced it through the origin. The odd suggestions that zero cover would have more than 2 t/ha in the second figure above is because of the assumed height of 2.5 m. Larger points in the graph are from taller stands.

FOI 190318	
Document 19	

From: Sent:	s22 Thursday, 13 September 2018 5:35 PM
To:	Dominic Devine
Cc:	Katrina Maguire; <mark>s22 ; s22 ; </mark>
Subject:	Draft rule amendment - revised version for discussion [SEC=UNCLASSIFIED]
Attachments:	draft rule amendment_HIR_NFMR (003).docx

Hi Dominic

Katrina asked us to send you a version of the draft rule as it would be proposed to apply to the NFMR method. We have marked it up in track changes so you can see the difference from the HIR one.

We are progressing a written response from Minister Price to your letter to Minister Frydenberg. The Regulator has told us they have now sent you their draft guidance.s47G

As discussed with Katrina it would be great to discuss all this information with you and Graham. We can also discuss the links between the draft rule and the Clean Energy Regulator's guidance.

Regards

s22 Director, Forests Section Climate Change Division Department of the Environment and Energy Ts22 Ms22 s22 @environment.gov.au

FOI 190318	
Document 20	

From: Sent:	s22 Tuesday, 18 September 2018 5:39 PM
To:	'Dominic Devine'
Cc:	Graham Kenny; Katrina Maguire
Subject:	RE: Draft rule amendment - revised version for discussion [SEC=UNCLASSIFIED]

Hi Dominic

Thanks for getting back to me. I'll make sure to pass your comments on the guidance on to the Regulator.

We'll look forward to further discussion with you.

Regards

s22

From: Dominic Devine [mailto:dominic.devine@leichardt.com.au]
Sent: Tuesday, 18 September 2018 1:37 PM
To: s22
Cc: Graham Kenny
Subject: Re: Draft rule amendment - revised version for discussion [SEC=UNCLASSIFIED]

s22

Thank you for your email. When we have received the responses from the Minister and the CER we will be in a position to further discuss all of the information.

We also note the following passage within the guidance:

"If after implementing the final form of this Guidance, proponents believe that they may no longer be able to meet their current contracted obligations, they are encouraged to contact the Clean Energy Regulator to discuss concerns. Each case will be handled on a case-by-case basis in line with contract provisions and under commercial-inconfidence arrangements."

The proposed rule change not only foreshadows what are in effect, amendments to the eligibility criteria and evidentiary requirements of the NFMR method. It also foreshadows the Commonwealth's belief that it is entitled to do so outside of the CFI Act's provisions concerning the variation of methods.



s47G

Regards

Dominic Devine

Devine Agribusiness Pty Ltd

Sent from my iPhone

On 13 Sep 2018, at 5:34 pm, s22 s22 <u>@environment.gov.au</u>> wrote:

Hi Dominic

Katrina asked us to send you a version of the draft rule as it would be proposed to apply to the NFMR method. We have marked it up in track changes so you can see the difference from the HIR one.

We are progressing a written response from Minister Price to your letter to Minister Frydenberg. The Regulator has told us they have now sent you their draft guidance. **47G**

As discussed with Katrina it would be great to discuss all this information with you and Graham. We can also discuss the links between the draft rule and the Clean Energy Regulator's guidance.

Regards

s22 Director, Forests Section Climate Change Division Department of the Environment and Energy T s22 M s22 s22 @environment.gov.au
s22

From: Graham Kenny [mailto:graham.kenny@leichardt.com.au]
Sent: Monday, 26 November 2018 10:01 AM
To: Emissions Reduction Assurance Committee
Subject: RE: HIR/NFMR review meeting invitation [SEC=UNCLASSIFIED]

Good morning,

Dominic Devine and I will participate via teleconference.

Regards

Graham Kenny Devine Agribusiness Carbon Pty. Ltd.

graham.kenny@leichardt.com.au T: 07 3226 7777 GPO Box 948, Brisbane Qld 4001 Level 27, 32 Turbot Street, Brisbane Qld 4000

From: Emissions Reduction Assurance Committee
Sent: Thursday, 22 November 2018 3:22 PM
Cc: Emissions Reduction Assurance Committee
Subject: HIR/NFMR review meeting invitation [SEC=UNCLASSIFIED]

Dear all,

On behalf of the Emissions Reduction Assurance Committee, we would like to invite you to a meeting on the HIR and NFMR method review. At the meeting, the Committee will share the main findings of their review with you, ahead of finalising the review report and providing it to the Minister for the Environment.

The meeting details are as follows.

- Date and time: Monday 3 December, 9.30am-12pm.
- Location: Department of the Environment and Energy, John Gorton Building, King Edward Terrace, Parkes, Canberra.
- For those unable to attend in person, you may participate via teleconference (dial-in number: 1800 047 396; participant passcode: 716464).

Could you please let us know by Tuesday 27 November if you would like to attend.

Please note also that the Clean Energy Regulator would like to discuss some administrative matters with you on the afternoon of Monday 3 December, and will issue a separate invitation.

Kind regards,

s22 Director

Emissions Reduction Fund Governance and Policy Department of the Environment and Energy | Australian Government

T: s22 | M: s22

E: s22 @environment.gov.au

GPO Box 787, Canberra ACT 2601

s22 Erfforests From: Monday, 3 December 2018 9:14 AM Sent: @climatefriendly.com'; s22 @climatefriendly.com'; To: s47F @corporatecarbon.com.au'; s47F @selectcarbon.com'; s47F @greencollargroup.com.au'; s47F @greencollargroup.com.au'; s47F @biodiversecarbon.com'; 'dominic.devine@leichardt.com.au'; s47F 'graham.kenny@leichardt.com.au'; s47F @cleanenergytechnology.com.au'; s47F @countrycarbon.com.au'; s47F @co2australia.com.au'; @ResourceIntel.com.au'; 's22 s47F s22 @cleanenergyregulator.gov.au' 'Andrew Macintosh'; Mick Keogh s47F Cc: ; s22 Katrina Maguire; s22 @co2australia.com.au'; s22 ;s47F s47F @carbonfarmersofaustralia.com.au'; @climatefriendly.com'; @corporatecarbon.com.au'; s47F s47F Hilary Smith (hilary@s22); 'beverley.henry@s22 Subject: HIR-NFMR review: stakeholder meeting [SEC=UNCLASSIFIED] **Attachments:** ERAC review findings overview 2 Dec 2018.pptx

Good morning everyone,

Please find attached the slides for this morning's meeting on the main findings from the Emissions Reduction Fund Assurance Committee's review of the two regeneration methods (HIR-NFMR).

The meeting will commence shortly, at 9:30.

Thank you,

s22

Forests Section Climate Change Division

Australian Government Department of the Environment and Energy John Gorton Building, Parkes, ACT 2600 CPO Box 787, Canberra ACT 2601 | S22 Cenvironment.gov.au | Environment.gov.au



FOI 190318	
Document 23	

s22

From:	s22
Sent:	Tuesday, 4 December 2018 9:27 AM
То:	'Dominic Devine'
Cc:	Katrina Maguire
Subject:	Letter from Minister for the Environment and Energy - CFI Rule amendment [SEC=UNCLASSIFIED]
Attachments:	Devine Agribusiness reply.pdf

Hi Dominic

A copy of the Minister for the Environment and Energy's reply to your letter to the former Minister about amendments to the CFI Rule is attached for your information. The Minister's reply has been posted to you.

Regards

s22 Director, Forests Section Climate Change Division Department of the Environment and Energy T s22 M s22 s22 @environment.gov.au



THE HON MELISSA PRICE MP MINISTER FOR THE ENVIRONMENT

MC18-015257

Mr Dominic Devine Devine Agribusiness Carbon Pty Ltd GPO Box 948 BRISBANE QLD 4001

2 1 NOV 2018

Dear Mr Devine

Thank you for your letter to the former Minister for the Environment and Energy, the Hon Josh Frydenberg MP, regarding the Department of the Environment and Energy's proposal to amend the *Carbon Credits (Carbon Farming Initiative) Rule 2015*. This correspondence has been referred to me as it falls under my responsibilities as the Minister for the Environment.

The Emissions Reduction Fund is successfully supporting Australian businesses, communities and landholders to reduce emissions. So far it has secured more than 190 million tonnes of emissions reductions. Vegetation projects such as yours are making a significant contribution to the Fund's success and providing an income stream for participants.

The integrity of the Fund is paramount and the independent Emissions Reduction Assurance Committee (ERAC) has an important role in advising me whether the methods meet the Offsets Integrity Standards. As you know the Committee is currently reviewing the Native Forest from Managed Regrowth and Human-Induced Regeneration methods. The object of both methods is to regenerate native forest. The ERAC has indicated it is reviewing them at the same time because, while there are some differences, there are enough similarities in the two methods to warrant concurrent reviews. I understand the ERAC expects to complete its review in the next few months, and I look forward to seeing its report.

During the review, the ERAC has identified a risk that crediting could exceed the actual carbon that is stored if regenerating vegetation does not reach forest cover in a reasonable period of time. The ERAC identified this risk is relevant for both methods. While existing projects are in early stages of regeneration, this risk could arise in future, when the vegetation reaches an age at which it would be expected to have reached forest cover. The ERAC identified a need for the risk to be managed by the Australian Government being clear about its expectations of a reasonable timeframe for reaching forest cover; the means of assessing whether forest cover has been achieved; and aligning crediting with progress towards achieving forest cover.

As you know the Department released a proposed rule that would apply to projects under the Human-Induced Regeneration method for public consultation. This was released ahead of the proposed rule for projects operating under the Native Forest from Managed Regrowth method.

I approved the rule applying to projects under the Human-Induced Regeneration method on 21 November 2018. The rule is designed to clarify project reporting and crediting requirements. It also specifies, based on available science, a reasonable period of time to reach forest cover. The rule is designed to work in conjunction with the existing method and the Clean Energy Regulator's guidance on the methods. The Regulator's guidance will assist in cost-effectively identifying, and removing from projects, areas of land that are not progressing towards forest cover. The rule and the guidance are intended to provide more certainty about projects' performance over time.

I understand my Department, the Clean Energy Regulator and the Chair and members of ERAC worked closely with project participants to design the rule in a way that enhances the integrity of the methods and can be implemented. I encourage you to continue working with my Department to achieve the same outcome for projects under the Native Forest from Managed Regrowth method.

Thank you for bringing your concerns to my attention. I have copied this letter to the Hon David Littleproud MP, Member for Maranoa.

Yours sincerely

MELISSA PRICE

cc: The Hon David Littleproud MP

s22

From:	s22
Sent:	Monday, 10 December 2018 1:03 PM
То:	'Graham Kenny'
Cc:	'Dominic Devine'
Subject:	RE: Confirming 2.00 Tuesday for phone call on HIR/NFMR [SEC=UNCLASSIFIED]

Hi Graham

ERAC members participating in the discussion tomorrow will be Andrew Macintosh and Hilary Smith, with Beverley Henry still subject to confirmation. I'll be on the line from the Department.

Regards

s22

From: s22 Sent: Friday, 7 December 2018 4:17 PM To: 'Graham Kenny' Cc: 'Dominic Devine' ; Katrina Maguire Subject: Confirming 2.00 Tuesday for phone call on HIR/NFMR [SEC=UNCLASSIFIED]

Hi again Graham

I can confirm the discussion with ERAC members for 2-3pm Canberra time on Tuesday. I'll get back to you once we have confirmed all participants.

The dial-in number is 1800 047 396 The participant code is 716464

We'll look forward to speaking with you then.

s22

From: s22

Sent: Friday, 7 December 2018 2:54 PM
To: 'Graham Kenny' <graham.kenny@leichardt.com.au>
Cc: Dominic Devine <dominic.devine@leichardt.com.au>; Katrina Maguire <<u>Katrina.Maguire@environment.gov.au</u>>
Subject: RE: HIR/NFMR review meeting - suggested further discussion [SEC=UNCLASSIFIED]

Hi Graham

I am checking availability with the ERAC members. I might not be able to get back to you before Monday morning.

Regards

s22

From: Graham Kenny [mailto:graham.kenny@leichardt.com.au]Sent: Friday, 7 December 2018 11:45 AMTo: s22s22genvironment.gov.au>

Cc: Dominic Devine <<u>dominic.devine@leichardt.com.au</u>>; Katrina Maguire <<u>Katrina.Maguire@environment.gov.au</u>> Subject: RE: HIR/NFMR review meeting - suggested further discussion [SEC=UNCLASSIFIED]

s22

How is 2:00 PM on Tuesday? (That will be 1:00 PM in QLD).

Regards

Graham Kenny Devine Agribusiness Carbon Pty. Ltd.

graham.kenny@leichardt.com.au T: 07 3226 7777 GPO Box 948, Brisbane Qld 4001 Level 27, 32 Turbot Street, Brisbane Qld 4000

 From: s22
 s22
 @environment.gov.au>

 Sent: Wednesday, 5 December 2018 11:15 AM

 To: Graham Kenny <graham.kenny@leichardt.com.au>

 Cc: Dominic Devine <dominic.devine@leichardt.com.au>; Katrina Maguire <<u>Katrina.Maguire@environment.gov.au></u>

 Subject: RE: HIR/NFMR review meeting - suggested further discussion [SEC=UNCLASSIFIED]

Hi Graham

Thanks for getting back to us. We'll look forward to hearing from you.

Regards

s22

From: Graham Kenny [mailto:graham.kenny@leichardt.com.au]

Sent: Tuesday, 4 December 2018 4:44 PM

To: s22 s22 @environment.gov.au>

Cc: Dominic Devine <<u>dominic.devine@leichardt.com.au</u>>; Katrina Maguire <<u>Katrina.Maguire@environment.gov.au</u>> **Subject:** Re: HIR/NFMR review meeting - suggested further discussion [SEC=UNCLASSIFIED]

His22

I'm on the road for the next couple of days, so could we come back to you on Friday with some possible times for next week? We will also both be in the same place then so will make it a lot easier for us.

Graham.

On 3 Dec 2018, at 4:28 pm, s22 s22 <u>@environment.gov.au</u>> wrote:

Hi Dominic and Graham

Following on from the meeting this morning to discuss the Emissions Reduction Assurance Committee's findings from its review of the HIR and NFMR methods, I wanted to check your availability to discuss findings relating to the NFMR method with committee members. They would be happy to discuss the issues summarised in the slides circulated this morning (thanks for dialling in Graham), and the review more broadly.

Are you available any time this week?

Regards

s22

From: s22

Sent: Thursday, 29 November 2018 5:30 PM
To: 'Dominic Devine' <<u>dominic.devine@leichardt.com.au</u>>; Graham Kenny <<u>graham.kenny@leichardt.com.au</u>>; Graham Kenny <<u>graham.kenny@leichardt.com.au</u>; Graham Kenny

Hi Dominic and Graham

Thanks for letting us know you will be able to dial in to the Emissions Reduction Assurance Committee's briefing on findings of its review of the Human-Induced Regeneration and Native Forest from Managed Regrowth methods on Monday 3 December.

The Committee Chair, Andrew Macintosh, has also asked me to contact you to suggest a separate discussion with you on findings specific to the NFMR method. Would you be able to indicate a time that would suit you, either later on Monday or on another day?

You are also welcome to dial in for the discussion on Monday about the review's broader findings.

Regards

s22 Director, Forests Section Climate Change Division Department of the Environment and Energy T s22 M s22 s22 @environment.gov.au

From: Graham Kenny [mailto:graham.kenny@leichardt.com.au]
Sent: Monday, 26 November 2018 10:01 AM
To: Emissions Reduction Assurance Committee <<u>ERAC@environment.gov.au</u>>
Subject: RE: HIR/NFMR review meeting invitation [SEC=UNCLASSIFIED]

Good morning,

Dominic Devine and I will participate via teleconference.

Regards

Graham Kenny Devine Agribusiness Carbon Pty. Ltd.

graham.kenny@leichardt.com.au T: 07 3226 7777 GPO Box 948, Brisbane Qld 4001 Level 27, 32 Turbot Street, Brisbane Qld 4000

From: Emissions Reduction Assurance Committee <<u>ERAC@environment.gov.au</u>> Sent: Thursday, 22 November 2018 3:22 PM

Cc: Emissions Reduction Assurance Committee <<u>ERAC@environment.gov.au</u>> **Subject:** HIR/NFMR review meeting invitation [SEC=UNCLASSIFIED]

Dear all,

On behalf of the Emissions Reduction Assurance Committee, we would like to invite you to a meeting on the HIR and NFMR method review. At the meeting, the Committee will share the main findings of their review with you, ahead of finalising the review report and providing it to the Minister for the Environment.

The meeting details are as follows.

- Date and time: Monday 3 December, 9.30am-12pm.
- Location: Department of the Environment and Energy, John Gorton Building, King Edward Terrace, Parkes, Canberra.
- For those unable to attend in person, you may participate via teleconference (dial-in number: 1800 047 396; participant passcode: 716464).

Could you please let us know by Tuesday 27 November if you would like to attend.

Please note also that the Clean Energy Regulator would like to discuss some administrative matters with you on the afternoon of Monday 3 December, and will issue a separate invitation.

Kind regards,

s22

Director Emissions Reduction Fund Governance and Policy

Department of the Environment and Energy | Australian Government

T: s22 | M: s22

E: s22 @environment.gov.au

GPO Box 787, Canberra ACT 2601

s22	
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s22
Friday, 21 December 2018 9:13 AM
Dominic Devine; 'Graham Kenny'
'Andrew Macintosh'; Hilary Smith; Beverley Henry; mjkeogh@s22 ;
Katrina Maguire; s22 s22 s22
Native forest from managed regrowth method: meeting notes and next steps [SEC=UNCLASSIFIED]
Consultation_ERAC_Devine Agribusiness_ 11Dec2018_Notes.docx; CSIRO_Final report_Stand biomass and canopy cover_0818.pdf; Biomass to canopy cover report and data [SEC=UNCLASSIFIED]

Hi Dominic and Graham

Thank you for making the time to speak with the Emissions Reduction Assurance Committee members on 11 December.

As requested, the Department has prepared meeting notes for your reference. They aim to capture the main points discussed. Let me know if you have any questions or comments.

You asked the Department for any further information we had on the work done to assess the relationship between crown cover and biomass to inform the review of the methods. The CSIRO report on biomass to canopy cover (attached) and analysis conducted by **s22** of the Queensland Department of Environment and Science (included in the attached email) were both shared with you in August. I can confirm this is the complete set of information the Department holds on this work. I have provided a short overview of this analysis below.

As discussed during the meeting last week, the ERAC would be happy to consider any information you would like to provide by early next year in relation to its concerns about the NFMR method. You can send information to me, and we'll forward it to ERAC members.

Overview of biomass to canopy cover analysis

CSIRO's analysis looked at the biomass to canopy cover relationship, and found regrowth contains on average 3.85 tonnes of carbon per hectare in the above and below ground biomass when forest cover is attained (minimum 20% canopy cover and 2 metres in height, with canopy cover being the later of these two thresholds typically reached). Please refer to Figure 8 in the CSIRO report on canopy cover, as well as Figure 9 for height. The 3.85 tonne figure is multiplied by an expansion factor of 1.43 to convert the figure for the above-and-below ground biomass to that covering both the trees and debris pools within FullCAM. NCAS: Review of Allometric Relationships for Estimating Woody Biomass has further information on this expansion factor. This converts 3.85 tonnes of carbon per hectare in trees to approximately <u>5.5 tonnes of carbon per hectare</u> in the trees and debris pools.

s22 analysis of tree biomass, canopy cover and height suggests regrowth reaching 2.5 metres height and 25% canopy cover (above the 2 metre height / 20% canopy cover thresholds for forest cover as defined by the National Inventory) can be expected to have about <u>3.6 tonnes of carbon per hectare</u>, after accounting for carbon in debris. See the second point beneath Figure 2 in the attached email.

s22 also reviewed the CSIRO analysis before it was finalised. The CSIRO report and **s22** 's work show the sources of the data they used. The species and regions they cover give good representation of regions with HIR and NFMR projects.

Using the results from these analyses, the Department has looked at the canopy cover to biomass relationship from another angle. We used FullCAM to model the time it would take regrowth to reach the

levels of biomass equating to 20% crown cover in the analyses. The results showed regrowth in regions with existing NFMR projects reaching 3.6-5.5 tonnes of carbon (trees and debris) per hectare after 8-11 years.

As I mentioned following your discussion with ERAC members last week, the Department would like to discuss next steps on the CFI Rule amendment with you. We would like to meet you to discuss this during the week commencing 7 January, with a view to starting public consultation on the amendment later in January. We are happy to come to Queensland, or to discuss by phone if you aren't able to meet in person. Could you please let me know when you might be available?

We'll look forward to speaking with you next year. Best wishes for Christmas and the new year.

Regards

 s22

 Director, Forests Section

 Climate Change Division

 Department of the Environment and Energy

 T s22
 M s22

 s22
 @environment.gov.au

Emissions Reduction Assurance Committee's review of the Human-Induced Regeneration (HIR) and Native Forest for Managed Regrowth (NFMR) methods

Notes from teleconference, Tuesday, 11 December 2018

ERAC:

Department of the

•

- Andrew Macintosh (Chair)
- Beverley Henry
- Hilary Smith
- Environment and Energy:s22

s22

- Energy:
- Devine Agribusiness:Dominic Devine
 - Graham Kenny

<u>Purpose</u>

Emissions Reduction Assurance Committee (ERAC) members discussed the findings and recommendations of the review of the HIR and NFMR methods with carbon service providers on 3 December 2018. The purpose of the teleconference was to discuss in more detail three concerns about the NFMR method outlined by the ERAC on 3 December, and offer Devine Agribusiness an opportunity to provide further evidence for the ERAC to consider in finalising its review report s47C



s47C

s47C

Next steps

- 1) Devine Agribusiness will consider other evidence they may be able to provide for the ERAC to consider in relation to aspects of the method it has concerns about.
- 2) The Department will check for any information on the CSIRO and Queensland Department of Environment and Science assessments of the relationship between crown cover and biomass not already provided to Devine Agribusiness, and forward on any additional information.

s22

From:	s22
Sent:	Friday, 25 January 2019 4:34 PM
То:	Dominic Devine; 'Graham Kenny'
Cc:	s22 ; s22
Subject:	Proposed further CFI Rule amendment for regeneration projects [SEC=UNCLASSIFIED]
Attachments:	Rule amendment 2019 draft.docx

Hi Dominic and Graham

As mentioned in my email on 21 December and discussed with Dominic today, we would like to discuss next steps on the CFI Rule amendment with you. We have prepared a new draft amendment that would apply the same requirements adopted in the amendment made last year for Human-Induced Regeneration projects, to Native Forest from Managed Regrowth projects. Those amendments require HIR projects to attain forest cover within a specified period to continue to obtain certificates of entitlement.

The Department is also proposing further additions to the rule to ensure that where HIR and NFMR project proponents have stratified in accordance with the Clean Energy Regulator's *Guidelines on stratification, evidence and records for projects under the Human-Induced Regeneration of a Permanent Even-Aged Native Forest and Native Forest from Managed Regrowth methods,* they are able to repeat the process used to identify forest for the assessment of forest cover attainment. The proposed changes are set out in the attachment and further explained below.

The Department and Regulator plan to hold a teleconference to discuss these proposed amendments on Tuesday, 29 January, from 1.00 to 2.00 pm AEDT. We are inviting carbon service providers for HIR and NFMR projects to participate. Dial in details are: phone 1800 047 396, participant code 716 464.

We can discuss the proposed changes separately with you, if you prefer. As mentioned previously, we are happy to come to Queensland to do this, or otherwise we can discuss over the phone. We would also welcome any comments you'd like to send by email.

Explanation of revisions

Section 9AA of the *Carbon Credits (Carbon Farming Initiative) Rule 2015* sets out requirements for the assessment of forest cover at each carbon estimation area's 'forest cover assessment date'. There are currently two methods of demonstrating forest cover in subsection 9AA(4), namely:

- a) "over 90% of the area of the carbon estimation area is identified as having forest cover in accordance with the most recent version of the maps that form the basis of the National Inventory Report"; or
- b) "when assessed in 0.2 hectare portions, over 90% of those portions have attained forest cover such that the land in each portion has trees that are 2 metres or more in height and provide crown cover of at least 20% of the land".

Subsection 9AA(5) requires the second method of assessment to meet requirements in the CFI Mapping Guidelines and take into account guidelines published by the Regulator.

The Department is considering whether the rule should be amended so that:

1. The first method could only be used if the most recent version of the maps that form the basis of the National Inventory Report do not identify any pre-existing forest cover in the carbon estimation area taking into account any guidelines published by the Regulator on its website for the purpose of this subparagraph, as in force from time to time. Essentially this means that the latest Inventory does not see pre-existing forest cover in the carbon estimation area. The amendments provide that relevant provisions of the Regulator's guidelines are taken into account when

applying this method to pre-existing forest cover, which could include instructions for interpreting the available Inventory maps for example.

2. Subsection 9AA(5) of the rule makes it explicit that the assessment of forest cover at the forest cover assessment date (the second method) must use the same data sources and data processing approaches as are relied upon to demonstrate that the carbon estimation area does not have any pre-existing forest cover. This is currently a matter to be dealt with in the Regulator's guidelines, but would now be included in the rule. It would ensure a consistent approach to excluding pre-existing forest and attaining forest cover is used. The amendments also provide that those sources and approaches are approved by the Regulator on a list published on its website or are otherwise approved by the Regulator in writing. For example, the Regulator may list a range of generally approved data sources and processes, but is also able to individually approve particular data sources and processes for individual projects or proponents where that is appropriate.

To support these changes, the definition of 'pre-existing forest cover' previously included in the consultation draft of the rule would be included in subsection 9AA(7). That definition is available here: <u>http://www.environment.gov.au/climate-change/government/emissions-reduction-fund/consultation/erf-native-forest-regeneration</u> and is in the attachment.

The wording of subparagraph 70(3A)(a)(v) has also been clarified as the word 'boundaries' was always intended to include the concept of 'stratification' as understood by the method.

To apply the various rules to NFMR projects, the term 'human-induced regeneration project' would be replaced with the simpler term 'regeneration project' and that defined to include both HIR and NFMR projects. This is then relevant to:

- Certificates of entitlement in s 9AA;
- Offsets reporting in s 70;
- Documents to accompany offsets reports in s 71; and
- Audits in s 79A.

Regards

s22 Director, Forests Section Climate Change Division Department of the Environment and Energy T s22 M s22 s22 @environment.gov.au

s22

From:	Graham Kenny <graham.kenny@leichardt.com.au></graham.kenny@leichardt.com.au>
Sent:	Sunday, 17 February 2019 10:48 AM
То:	s22
Cc:	Dominic Devine
Subject:	RE: Proposed further CFI Rule amendment for regeneration projects
	[SEC=UNCLASSIFIED]

His22,

I am just confirming that we have secured a meeting room at the venue advised below; Swiss Bel-Hotel, 218 Vulture Street, South Brisbane.

Also just want to confirm that we are working on 10am QLD time, which will be 11am Canberra time. Just let us know if you have any delays on the way up.

Regards

Graham Kenny Devine Agribusiness Carbon Pty. Ltd.

graham.kenny@leichardt.com.au T: 07 3226 7777 GPO Box 948, Brisbane Qld 4001 Level 27, 32 Turbot Street, Brisbane Qld 4000

From: Graham Kenny
Sent: Monday, 11 February 2019 5:03 PM
To: s22
Cc: Dominic Devine
Subject: RE: Proposed further CFI Rule amendment for regeneration projects [SEC=UNCLASSIFIED]

His22,

Thanks for getting back to us. Let's make it a 10am start. Yes no problem for s22 to attend.

The tentative venue is Swiss Bel-Hotel, 218 Vulture Street, South Brisbane. We will organise a meeting room there.

Regards

Graham Kenny Devine Agribusiness Carbon Pty. Ltd.

graham.kenny@leichardt.com.au T: 07 3226 7777 GPO Box 948, Brisbane Qld 4001 Level 27, 32 Turbot Street, Brisbane Qld 4000 To: Graham Kenny <graham.kenny@leichardt.com.au>
 Cc: Dominic Devine <<u>dominic.devine@leichardt.com.au</u>>
 Subject: RE: Proposed further CFI Rule amendment for regeneration projects [SEC=UNCLASSIFIED]

Hi Graham

Thanks for the offer. Monday would work for us. **s22** and I can come. Would it suit you if we planned to start around 9.00 and allow up until lunchtime? If not, we'll work in with your availability.

Would you be comfortable for s22 from the Regulator to come as well, so we can talk about how the proposed rule changes tie in with the Regulator's guidelines?

Regards

s22

 From: Graham Kenny [mailto:graham.kenny@leichardt.com.au]

 Sent: Monday, 11 February 2019 9:36 AM

 To: s22
 s22

 @environment.gov.au>

 Cc: Dominic Devine <dominic.devine@leichardt.com.au>

 Subject: RE: Proposed further CFI Rule amendment for regeneration projects [SEC=UNCLASSIFIED]

His22,

Dominic will be in Brisbane next week and would like to know if you would be available to come up and meet with us, as suggested below, on Monday 18 February?

Regards

Graham Kenny Devine Agribusiness Carbon Pty. Ltd.

graham.kenny@leichardt.com.au T: 07 3226 7777 GPO Box 948, Brisbane Qld 4001 Level 27, 32 Turbot Street, Brisbane Qld 4000

 From: s22
 s22
 @environment.gov.au>

 Sent: Friday, 25 January 2019 3:34 PM

 To: Dominic Devine <dominic.devine@leichardt.com.au>; Graham Kenny <graham.kenny@leichardt.com.au>

 Cc: s22
 s22
 @environment.gov.au>; s22
 s22
 @ags.gov.au>

 Subject: Proposed further CFI Rule amendment for regeneration projects [SEC=UNCLASSIFIED]

Hi Dominic and Graham

As mentioned in my email on 21 December and discussed with Dominic today, we would like to discuss next steps on the CFI Rule amendment with you. We have prepared a new draft amendment that would apply the same requirements adopted in the amendment made last year for Human-Induced Regeneration projects, to Native Forest from Managed Regrowth projects. Those amendments require HIR projects to attain forest cover within a specified period to continue to obtain certificates of entitlement.

The Department is also proposing further additions to the rule to ensure that where HIR and NFMR project proponents have stratified in accordance with the Clean Energy Regulator's Guidelines on stratification, evidence and records for projects under the Human-Induced Regeneration of a Permanent Even-Aged Native Forest and Native

Forest from Managed Regrowth methods, they are able to repeat the process used to identify forest for the assessment of forest cover attainment. The proposed changes are set out in the attachment and further explained below.

The Department and Regulator plan to hold a teleconference to discuss these proposed amendments on Tuesday, 29 January, from 1.00 to 2.00 pm AEDT. We are inviting carbon service providers for HIR and NFMR projects to participate. Dial in details are: phone 1800 047 396, participant code 716 464.

We can discuss the proposed changes separately with you, if you prefer. As mentioned previously, we are happy to come to Queensland to do this, or otherwise we can discuss over the phone. We would also welcome any comments you'd like to send by email.

Explanation of revisions

Section 9AA of the *Carbon Credits (Carbon Farming Initiative) Rule 2015* sets out requirements for the assessment of forest cover at each carbon estimation area's 'forest cover assessment date'. There are currently two methods of demonstrating forest cover in subsection 9AA(4), namely:

- a) "over 90% of the area of the carbon estimation area is identified as having forest cover in accordance with the most recent version of the maps that form the basis of the National Inventory Report"; or
- b) "when assessed in 0.2 hectare portions, over 90% of those portions have attained forest cover such that the land in each portion has trees that are 2 metres or more in height and provide crown cover of at least 20% of the land".

Subsection 9AA(5) requires the second method of assessment to meet requirements in the CFI Mapping Guidelines and take into account guidelines published by the Regulator.

The Department is considering whether the rule should be amended so that:

- 1. The first method could only be used if the most recent version of the maps that form the basis of the National Inventory Report do not identify any pre-existing forest cover in the carbon estimation area taking into account any guidelines published by the Regulator on its website for the purpose of this subparagraph, as in force from time to time. Essentially this means that the latest Inventory does not see pre-existing forest cover in the baseline period but now sees over 90% forest cover in the carbon estimation area. The amendments provide that relevant provisions of the Regulator's guidelines are taken into account when applying this method to pre-existing forest cover, which could include instructions for interpreting the available Inventory maps for example.
- 2. Subsection 9AA(5) of the rule makes it explicit that the assessment of forest cover at the forest cover assessment date (the second method) must use the same data sources and data processing approaches as are relied upon to demonstrate that the carbon estimation area does not have any pre-existing forest cover. This is currently a matter to be dealt with in the Regulator's guidelines, but would now be included in the rule. It would ensure a consistent approach to excluding pre-existing forest and attaining forest cover is used. The amendments also provide that those sources and approaches are approved by the Regulator on a list published on its website or are otherwise approved by the Regulator in writing. For example, the Regulator may list a range of generally approved data sources and processes, but is also able to individually approve particular data sources and processes for individual projects or proponents where that is appropriate.

To support these changes, the definition of 'pre-existing forest cover' previously included in the consultation draft of the rule would be included in subsection 9AA(7). That definition is available here: http://www.environment.gov.au/climate-change/government/emissions-reduction-fund/consultation/erf-native-forest-regeneration and is in the attachment.

The wording of subparagraph 70(3A)(a)(v) has also been clarified as the word 'boundaries' was always intended to include the concept of 'stratification' as understood by the method.

To apply the various rules to NFMR projects, the term 'human-induced regeneration project' would be replaced with the simpler term 'regeneration project' and that defined to include both HIR and NFMR projects. This is then relevant to:

- Certificates of entitlement in s 9AA;
- Offsets reporting in s 70;
- Documents to accompany offsets reports in s 71; and
- Audits in s 79A.

Regards

s22

Director, Forests Section Climate Change Division Department of the Environment and Energy T s22 M s22 s22 @environment.gov.au

47G





FOI 190318	
Document 29	

s22

From:	s22
Sent:	Tuesday, 26 February 2019 5:41 PM
То:	Dominic Devine; 'Graham Kenny'
Cc:	Katrina Maguire; s22 ; s22
Subject:	Proposed CFI Rule amendments - follow up to last week's discussions [SEC=UNCLASSIFIED]

Hi Dominic and Graham

Thanks for meeting s22 , s22 and me in Brisbane on 18 February and for the phone call with Katrina and me on 19 February to discuss the proposed changes to the CFI Rule. From our perspective it was useful to talk through how the proposed changes to the Rule, together with the Clean Energy Regulator's guidelines, would apply to your Native Forest from Managed Regrowth projects.

We understand your concerns about the proposed changes to the Rule centre on the effects the changes would have on business certainty for you and your clients and investors. Thanks also for forwarding Katrina a copy of your letter to the Minister today, and apologies for the time taken to get back to you on the main concerns you raised last week. We thought it would still be useful to send you our responses to those concerns.

Time to attain forest cover

Based on the discussions last week, we understand one of your main concerns is about the additional assessment tasks, and associated costs, involved with the proposed requirement to demonstrate forest cover 15 years after the project declaration date.



Analysis we have discussed previously with you indicates regenerating vegetation typically attains forest cover in the regions where projects are located when the biomass reaches five tonnes of carbon per hectare in the tree and debris pools. FullCAM estimates for these regions show this level is reached within 15 years. Under the Rule, existing projects would be allowed 15 years from project declaration, in addition to the preceding period from commencement of modelling of regeneration, to reach forest cover. 47G

The proposed Rule also allows extra time, where appropriate, to take into account eligible growth disturbances or situations where slow growth results in vegetation not reaching 5 tonnes of carbon per hectare within 15 years.

Assessing forest cover

The other main concern you raised last week is the proposed requirement to use consistent data sources and data processing approaches for excluding pre-existing forest cover and assessing attainment of forest cover for all regeneration projects.



The National Inventory Report mapping is continuously improved, and can be expected to provide for robust assessment of forest cover attainment by the time the assessment dates are reached. Where the latest mapping

shows that areas identified as forest and excluded on the basis of earlier mapping did not actually have forest cover at the time, those areas could be included as eligible land in carbon estimation areas and generate credits if they have subsequently attained forest cover.

In addition to improving consistency of assessment over time, the Rule already provides flexibility in the requirements for demonstrating attainment of forest cover, by allowing carbon estimation areas to be accepted as meeting the requirement if over 90 per cent of their area shows forest cover.

During our meeting last week we undertook to get back to you about two other concerns you raised.

Reference to other instruments as in force from time to time

The first of these concerns was that the proposed new subparagraph 9AA(4)(a)(ii) providing for reference to guidelines published by the Regulator from time to time creates uncertainty by allowing for the guidelines to be changed over time. As explained in Item 3 in Attachment A of the explanatory statement for the previous and new Rule amendment, this provision is in line with section 304 of the CFI Act.

<u>Audits</u>

The second concern was about the provision in section 79A of the Rule for an audit of a regeneration project that has passed the forest cover assessment date. An audit would not be required if forest cover has already been attained or where the Regulator agrees it is unnecessary. You would be able to initiate revisions to your audit schedules with the Regulator to align timing with forest cover assessment dates, to avoid a need for an additional audit.

The Department has taken recent discussions and consultation over the last few months with you and Human-Induced Regeneration project proponents into account in developing the proposed changes to the Rule. Our recommendations to the Minister on releasing the further Rule changes for public consultation reflect the version we showed you last week. These proposed changes are designed to apply a consistent and equitable approach across the Native Forest from Managed Regrowth and Human-Induced Regeneration methods. We will consider all submissions before making any further recommendations to the Minister. We would be happy to work with you on any communications with your clients, banks and others to explain the proposed changes and respond to any concerns they may have.

Regards

s22 Director, Forests Section Climate Change Division Department of the Environment and Energy T s22 M s22 s22 @environment.gov.au

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From:	s22
Sent:	Thursday, 28 February 2019 9:18 AM
То:	Dominic Devine; 'Graham Kenny'
Subject:	Consultation on amendments to Emissions Reduction Fund rules for native forest regeneration projects [SEC=UNCLASSIFIED]

Hi Dominic and Graham

I am writing on behalf of the Department of the Environment and Energy, to invite you to comment on proposed amendments to the *Carbon Credits (Carbon Farming Initiative) Rule 2015.*

The proposed amendments apply to the *Carbon Credits (Carbon Farming Initiative) (Human-Induced Regeneration of a Permanent Even-Aged Native Forest—1.1) Methodology Determination 2013* and the *Carbon Credits (Carbon Farming Initiative) (Native Forest from Managed Regrowth) Methodology Determination 2013*. These proposed amendments link to the amendments made in November 2018.

This public consultation follows our recent preliminary discussions with you and others about the proposed amendments. The details of the proposed amendments are the same as those we showed you last week.

The exposure draft amendment rule, a document showing how the amendments would be incorporated, and the draft explanatory statement are available at: <u>https://www.environment.gov.au/climate-change/government/emissions-reduction-fund/consultation</u>

Comments are invited by Thursday 14 March 2019. Information on how to make a submission is available at the above web address. We would welcome your comments and are happy to discuss the proposed amendments with you. Please feel free to contact me if you would like to discuss them.

Regards

s22 Director, Forests Section Climate Change Division Department of the Environment and Energy T s22 M s22 s22 @environment.gov.au