

EXPLANATORY STATEMENT

Issued by the Authority of the Minister for the Environment and Energy

Carbon Credits (Carbon Farming Initiative) Act 2011

Carbon Credits (Carbon Farming Initiative-Measurement of Soil Carbon Sequestration in Agricultural Systems) Methodology Determination 2018

Background

Emissions Reduction Fund

The *Carbon Credits (Carbon Farming Initiative) Act 2011* (the Act) enables the crediting of greenhouse gas abatement from emissions reduction activities across the economy. Greenhouse gas abatement is achieved either by reducing or avoiding emissions or by removing carbon dioxide from the atmosphere and sequestering carbon in soil or vegetation.

In 2014, the Australian Parliament passed the *Carbon Farming Initiative Amendment Act 2014*, which established the Emissions Reduction Fund (ERF). The ERF has three elements: crediting emissions reductions, purchasing emissions reductions and safeguarding emissions reductions.

Emissions reduction activities are undertaken as offsets projects. The process involved in establishing an offsets project is set out in Part 3 of the Act. An offsets project must be covered by, and undertaken in accordance with, a methodology determination.

Subsection 106(1) of the Act empowers the Minister to make, by legislative instrument, a methodology determination. The purpose of a methodology determination is to establish procedures for estimating abatement (emissions reduction and sequestration) from eligible projects and rules for monitoring, record keeping and reporting. These methodologies will ensure that emissions reductions are genuine—that they are both real and additional to business as usual.

In deciding to make a methodology determination the Minister must have regard to the advice of the Emissions Reduction Assurance Committee (ERAC), an independent expert panel established to advise the Minister on proposals for methodology determinations. The Minister must not make or vary a methodology if the ERAC considers it inconsistent with the offsets integrity standards, which are set out in section 133 of the Act. The Minister will also consider any adverse environmental, economic or social impacts likely to arise as a result of projects to which the determination applies.

Offsets projects that are undertaken in accordance with the methodology determination and approved by the Clean Energy Regulator (the Regulator) can generate Australian carbon credit units (ACCUs), representing emissions reductions from the project. Project proponents can receive funding from the ERF by participating in a competitive auction run by the Regulator. The Government will enter into contracts with successful proponents, which will guarantee the price and payment for the future delivery of emissions reductions.

Further information on the ERF is available on the Department of the Environment website at: <http://www.environment.gov.au/emissions-reduction-fund>.

Soil carbon and agricultural practices that influence soil carbon

Soil carbon is primarily made up of decomposed plant material and microbes. Carbon rich materials, such as the roots, stems and leaves of crops or pasture, cycle into the soil, where part of it is broken down and respired into the atmosphere as carbon dioxide. Some remains to form soil carbon.

Soil carbon is highly variable across the landscape and through time. Research shows that this variability is largely explained by climatic factors and soil properties but that human activity also plays a role. This role can be observed in the general loss of soil carbon in agricultural soils since the 1800s due to changing land use.

In many cases, there are opportunities for land managers to improve soil carbon stocks by increasing the amount of carbon added to the soil and by slowing the rate of loss of carbon from the soil. These opportunities will be highly dependent on a number of site specific factors including the soil properties and selecting land management activities according to those factors. Furthermore, with climatic factors impacting soil carbon content, any attempt to increase soil carbon may also be affected by long term climate trends.

Earlier soil carbon methods

There are two existing Emissions Reduction Fund soil carbon methods: the *Carbon Credits (Carbon Farming Initiative) (Sequestering Carbon in Soils in Grazing Systems) Methodology Determination 2014*; and the *Carbon Credits (Carbon Farming Initiative—Estimating Sequestration of Carbon in Soil Using Default Values) Methodology Determination 2015*.

The first method, *Sequestering carbon in soils in grazing systems*, is based on the direct measurement of changes in soil carbon stock over time, in response to changes in grazing systems management. Collection and analysis of soil samples over time generates the data to estimate soil carbon stock change.

The second method, *Estimating sequestration of carbon in soil using default values*, is based on the use of default rates for soil carbon stock change over time, in response to changes in specified management practices for cropping systems. These default values were predicted using simulation results obtained by applying the Full Carbon Accounting Model (FullCAM) modelling system developed for, and used in, the Australian National Greenhouse Gas Inventory.

Soil Carbon Sequestration in Agricultural Systems Method

The 2015-16 method prioritisation process resulted in an agreement that a new soil carbon method should be developed building on the two existing soil carbon methodologies. The need was identified as there had been limited uptake of the existing soil carbon methods. This outcome was attributed to the narrow range of farming systems that were able to participate and the high costs of direct measurement.

The *Carbon Credits (Carbon Farming Initiative—Measurement of Soil Carbon Sequestration in Agricultural Systems) Methodology Determination 2018* seeks to overcome these limitations by introducing new components and adapting some components from the two earlier soil carbon methods. The major differences include:

- an improved soil sampling strategy to reduce uncertainty of soil carbon estimates, supporting the participation of a wider range of production systems;
- an increased range of eligible farming systems including cropping, grazing and horticultural production systems;
- allowing the use of soil amendments containing biochar and accounting for other additives that may contain carbon, including clay;
- an additional measurement option allowing for the ability to estimate carbon stocks using in-field or laboratory sensors and associated models as well as the combustion techniques;
- a ten year baseline period; and
- use of a land management strategy, to be developed or reviewed by an independent person.

Application of the determination

The determination sets out the detailed rules for implementing and monitoring offsets projects that sequester carbon in agricultural soils using certain types of management actions on project land.

Public consultation

The determination has been developed by the Department in consultation with the Regulator and in accordance with advice from technical experts in the field of soil carbon.

The Department held five Technical Working Group (TWG) meetings between August 2015 and March 2017 to provide scientific advice on key aspects of the method, and review draft versions of the determination.

The exposure draft of the determination was published on the Department's website at www.environment.gov.au for public consultation from 4 September 2017 to 2 October 2017. Submissions were received from seventeen individuals/organisations. Details of the non-confidential submissions are provided on the Department's website.

Determination details

The determination is a legislative instrument within the meaning of the *Legislation Act 2003*.

For the purpose of subsections 106(4), (4A) and (4B) of the Act, in making the determination the Minister has had regard to, and agrees with, the advice of the Emissions Reduction Assurance Committee that the determination complies with the offsets integrity standards and that the determination should be made. The Minister is satisfied that the carbon abatement used in ascertaining the carbon dioxide equivalent net abatement amount for a project is eligible carbon

abatement from the project. The Minister also had regard to whether any adverse environmental, economic or social impacts are likely to arise from the carrying out of the kind of project to which the determination applies.

The determination commences on the day after it is registered on the Federal Register of Legislation.

The determination expires when it is either revoked under section 123 of the Act, or on the day before it would otherwise be repealed under the *Legislation Act 2003*, whichever happens first. Under subsection 50(1) of that Act, a legislative instrument such as the determination is repealed on the first 1 April or 1 October falling on or after the tenth anniversary of registration of the instrument. For example, if the determination is registered on a day in the month of February 2018, it would expire on 31 March 2028.

Details of the determination are at [Attachment A](#).

A Statement of Compatibility prepared in accordance with the *Human Rights (Parliamentary Scrutiny) Act 2011* is at [Attachment B](#).

Details of the Methodology Determination

Part 1 - Preliminary

1 Name of determination

Section 1 sets out the full name of the determination, which is the *Carbon Credits (Carbon Farming Initiative—Measurement of Soil Carbon Sequestration in Agricultural Systems) Methodology Determination 2018*.

2 Commencement

Section 2 provides that the determination commences on the day after it is registered on the Federal Register of Legislation. For example, if the determination is registered on 1 February 2018, it would take effect from 12.01am on 2 December 2018.

3 Authority

Section 3 provides that the determination is made under subsection 106(1) of the *Carbon Credits (Carbon Farming Initiative) Act 2011* (the Act).

Subsection 106(1) of the Act provides that the Minister may, by legislative instrument, make a certain type of determination. Subsection 106(2) of the Act specifies that the determination is to be known as a ***methodology determination***.

4 Duration

Subsection 4(a) provides that the determination will begin when it commences. This is the day after it was registered as provided by section 2.

Under subparagraph 122(1)(b)(i) of the Act, a methodology determination remains in force for the period specified in the determination.

Subsection 4(b) provides that the determination will cease to be in force on the day before it would otherwise be repealed under subsection 50(1) of the *Legislation Act 2003*, i.e. the day before the 1 April or 1 October following the tenth anniversary of registration of the determination on the Federal Register of Legislation.

However, the determination will cease to be in force earlier if it is revoked in accordance with section 123 of the Act or section 42 of the *Legislation Act 2003*.

If the determination expires in accordance with section 122 of the Act or is revoked in accordance with section 123 during a crediting period for a project to which the determination applies, it will continue to apply to the project during the remainder of the crediting period under subsections 125(2) and 127(2) of the Act. Project proponents may apply to the Regulator during a reporting period to have a different methodology determination apply to their projects from the start of that reporting period (see subsection 128(1) of the Act).

Under section 27A of the Act, the ERAC may also suspend the processing of applications under a determination if there is reasonable evidence that the methodology determination does not comply with one or more of the offsets integrity standards. This does not impact applications for declaration already received by the Regulator before such a suspension or declared eligible offset projects which apply the determination.

5 Definitions

Section 5 defines a number of terms used in the determination.

The following should be noted about certain defined terms in the determination:

biochar – refers to organic material (such as animal manure, plant residue and woody waste) that has undergone a pyrolysis process and specifically excludes pyrolysis of material such as tyres, and human effluent.

designated waste stream – (e) *municipal or commercial waste collection processes* includes restaurant and supermarket waste. It does not include the collection of human effluent waste streams.

forest land – trees must be a height of at least 2 metres, **and** crown canopy cover of 20% or more **and** covering at least 0.2 of a hectare. This is consistent with the definition used by Australia in meeting international reporting obligations under the Kyoto Protocol.

hypersulfidic material – has the meaning given by the second edition of the Australian Soil Classification published by the Commonwealth Scientific and Industrial Research Organisation in 2016. While there may be subsequent editions of the Australian Soil Classification, the hypersulfidic definition as applied to the determination, will remain as the definition used in the second edition.

maintain – an eligible land management activity will be considered to be maintained where the original action has been completed but is still having a continuing impact on the storage of additional carbon. For example water ponding or incorporation of clay must only be carried out once, but is reasonably expected to continue to impact on the storage of additional carbon after the activity is completed.

material deficiency – plant growth is limited to materially less than otherwise could have been achieved, due to a low concentration of one or more nutrients or an imbalance of nutrients.

National Inventory Report – the report of that name produced by Australia in fulfilment of its obligations under the United Nations Framework Convention on Climate Change and the Kyoto Protocol, as in force from time to time. The National Inventory Report can be accessed from the Department's website: <http://www.environment.gov.au> and is a key part of Australia's international climate change reporting requirements.

non-synthetic fertiliser – the definition of 'non-synthetic fertiliser' limits the use of certain types of non-synthetic fertiliser in a soil carbon project. The determination restricts the use of non-synthetic fertilisers that include crop residue, hay or straw to those generated using dedicated waste products or are from a CEA within the project. This is because, removing biomass from an

area can potentially reduce soil organic carbon stocks, reducing the net environmental benefit from the project. This potential leakage risk does not arise where that crop residue, hay or straw would have been removed from an area under business as usual. For example, composts made using straw that was first used as poultry bedding would be eligible as the straw was removed from the paddock in which it originally grew for reasons unrelated to the project. In this situation it can be assumed that the project has not caused a decrease of soil organic carbon stocks through the removal of biomass.

soil landscape modification – means undertaking an eligible management activity classified under sub-section 7(4). These activities do not constitute tillage. Examples of these activities are clay delving and water ponding.

the Supplement – is the document entitled ‘The Supplement—for Measurement of Soil Carbon Sequestration in Agricultural Systems’, published by the Department and as in force from time to time (consistent with subsection 106(8) of the Act). The Supplement contains a range of information and detailed requirements necessary for the implementation of a project under the determination and is referred to a number of times in the determination. The Supplement can be viewed on the Department’s website (<http://www.environment.gov.au>). The use of the Supplement in offsets reporting is subject to the provisions of section 6.

synthetic fertiliser – specifically excludes biochar.

tillage – refers to any form of mechanical preparation of the soil and includes ploughing, cultivation and direct drill. This does not include activities under soil landscape modification.

thinning – must not be conducted to the extent that it would meet the clearing definition.

The note at the end of section 5 lists terms that are not defined in the determination but instead have the meaning given to them by section 5 of the Act.

References in the determination to ‘the Department’ are references to the department that is administered by the Minister administering the Act. When the determination commenced this was the Department of the Environment and Energy.

Under section 23 of the *Acts Interpretation Act 1901*, words in the determination in the singular number include the plural and words in the plural number include the singular.

6 References to factors and parameters from external sources

Section 6 refers to factors or parameters used in calculations that are derived from external sources. Factors or parameters used in this method are derived from the National Inventory Report, the Supplement, the *National Greenhouse and Energy Reporting Regulations 2008* (NGER Regulations), or the *National Greenhouse and Energy Reporting (Measurement) Determination 2008* (NGER Measurement Determination) which is made under subsection 10(3) of the *National Greenhouse & Energy Reporting Act 2007* (NGER Act).

The effect of subsection 6(1) is that if those instruments are amended during a project’s reporting period, then the project proponent will be required to use the factor or parameter prescribed in the instrument that is in force at the end of the reporting period.

Paragraph 6(2)(a) provides that subsection 6(1) does not apply if the determination sets out other requirements.

Paragraph 6(2)(b) provides that subsection 6(1) does not apply where it is not possible to apply retrospectively a factor or parameter in an instrument that is in force at the end of the reporting period. An example of circumstances where this may occur is where the monitoring approach defined in an external source is amended to require additional or different monitoring practices after the reporting period has commenced. In this circumstance it is not possible to undertake monitoring activities retrospectively in accordance with the new requirement.

As provided for by section 10 of the *Acts Interpretation Act 1901* and section 13 of the *Legislation Act 2003*, references to external documents which are legislative instruments (such as the NGER Measurement Determination) are to versions of those instruments as in force from time to time. In circumstances where paragraph 6(2)(b) of the determination applies, it is expected that project proponents will use the version of instruments in force at the time at which monitoring or other actions were conducted.

Part 2 - Soil carbon projects

7 Soil carbon projects

The effect of paragraph 27(4)(b) and 106(1)(a) of the Act is that a project must be covered by a methodology determination, and that the methodology determination must specify the kind of offsets project to which it applies.

Section 7 of the determination sets out the kind of project to which it applies.

Paragraph 7(2)(a) sets out a list of eligible management activities for the purposes of the determination.

Declaration as an eligible offsets project is dependent on implementing at least one of the eligible management activities listed in paragraph 7(2)(a). The following should be noted about certain eligible management activities at the following subparagraphs:

- 7(2)(a)(iv) New irrigation has the potential to sequester soil carbon by increasing biomass production. The determination requires that new irrigation is sourced from efficiency savings from either improvements to on-farm infrastructure or the efficiency of water management practices. This is because these sources of water are additional to baseline use, relatively easily accounted for and are less likely to lead to unintended environmental or economic impacts.
- 7(2)(a)(v) Re-establishing or rejuvenating a pasture by seeding. This process may aim to improve existing areas of pasture by activities that include, but are not limited to, attempting to increase ground cover, diversity of species types or establishing species with complementary seasonal and growth phases. Re-establishing or rejuvenating a pasture could involve pasture cropping, where planting of different plant types, such as cereals, sub-clover and ryegrass may complement different seasonal growth patterns and improve productivity.
- 7(2)(a)(x) Modifying landscape or landform features to remediate land. For example this would include undertaking water ponding.
- 7(2)(a)(xi) Using mechanical means to add soil to, or redistribute soil through the soil profile. This includes activities such as clay spreading and clay delving.

Proponents may implement other land management activities, provided they are not covered in section 11 and on the condition that they are carried out in accordance with any applicable criteria specified in section 12 of the determination. This provides proponents with the flexibility to respond to market forces, participate in the Emissions Reduction Fund and continue to make land management decisions enabling them to meet their broader business objectives.

The list of eligible management activities does not restrict the undertaking of innovative activities that are outside of the listed activities that are also aimed at improving carbon stocks. Activities that are outside of the eligible management activities, do not allow projects to be

declared as eligible however they may be used by an independent person to support statements about the ability of the land management activities to influence soil carbon.

Paragraph 7(2)(b) means that for an eligible management activity to support project registration it must be demonstrated that the activity is a new activity or materially different from the equivalent land management activity conducted during the baseline period and can reasonably be expected to sequester carbon. This means that for mixed farming enterprises (e.g. cropping and pasture) there must be an eligible management activity that is new or materially different being carried out or maintained in each phase type. For example, if there are cropping and pasture phases in the baseline period, in both phases during the project period, a new, eligible management activity must be undertaken (unless a single eligible management activity is applicable to both systems).

Evidence to demonstrate material difference for a specified activity may include invoices, log-books, contractual arrangements or other industry standard practices for both the baseline period and the project period.

The list of eligible management activities in paragraph 7(2)(a) are an indicative list of activities that may build soil carbon under specific circumstances. Undertaking an eligible management activity or eligible offsets project under this determination is not guaranteed to result in building soil carbon on any particular project site.

The project proponent can also use the land management strategy, prepared or reviewed by the independent person under section 13, to demonstrate if an eligible management activity can reasonably be expected to sequester carbon. In many cases, the land management strategy will be an integrated land management approach combining at least one of the eligible management activities listed in paragraph 7(2)(a) with other land management activities. This approach should consider the integrated management in the context of current peer-reviewed scientific literature, project specific factors (e.g. soil type, climate, rainfall etc.) historical land management and other factors that may influence soil carbon sequestration.

The land management strategy must be prepared or reviewed by an independent person. This is to ensure landholders are provided with independent advice tailored to their specific business and environmental context and the specific risks (e.g. the likelihood of sequestering carbon, suitability under landholders business) in undertaking a project under this determination. This provides landholders with information required to make decisions to meet their broader business objectives while participating in the ERF.

Subsection 7(5) excludes offset projects declared eligible as an *Estimating Sequestration of Carbon in Soil Using Default Values Methodology 2015* project, from transferring to this *Soil Carbon Sequestration in Agricultural Systems Method*, under a variation of a section 27 declaration as described in section 57 or applying the determination under section 128 to 130 of the Act. This is due to the incompatibility between the two methods.

This provision does not prevent an eligible offset project under the *Sequestering Carbon in Soils in Grazing Systems Methodology Determination 2014*, from transferring to this *Soil Carbon Sequestration in Agricultural Systems Method*.

Part 3 - Project Requirements

Division 1- General

8 General

The Act establishes general requirements for eligible projects, including the Regulator's role in declaring an eligible project.

The effect of paragraph 106(1)(b) of the Act, is that a methodology determination is allowed to specify requirements that a project must meet in order to be an eligible offsets project.

Under paragraph 27(4)(c) of the Act, the Regulator must not declare that a project is an eligible offsets project unless the Regulator is satisfied that the project meets the requirements specified in the applicable determination.

9 Project area and eligible land

Eligible land

Section 9 provides that a project area must include eligible land. Land that cannot be classified as eligible land can still be part of a project area, as either an exclusion zone or emissions accounting area.

Subsection 9(1) sets out the requirements for land to be considered eligible.

The effect of paragraph 9(1)(a) is that, to be eligible land, during the 10 year baseline period the land must have been pasture used for grazing, cropping (including perennial woody horticulture), bare fallow, or any combination of grazing, cropping or bare fallow, provided one or more applied at all times during the baseline period.

The intent of paragraph 9(1)(b) is to prevent clearing of forested areas and increase emissions as a result of implementing the soil carbon project.

Other structures in paragraph 9(1)(c) includes structures such as houses and sheds, roads, dams, stock yards, bores and aerial towers. It does not include fences. It is intended that structures are excluded from CEAs.

The intent of paragraph 9(1)(d) is to prevent draining of wetlands, therefore increasing emissions as a result of implementing the soil carbon project.

Paragraph 9(1)(e) clarifies that in order for land to be eligible land it must have soil carbon sequestration potential.

Paragraph 9(1)(f) requires that it is possible to sample the land in a way that is consistent with the requirements of this Determination. Where sampling of land cannot consistently meet the requirements, the land should not form part of any CEA. An example of this is where sub-soil obstruction, such as bedrock would consistently prevent sampling to the minimum 30cm depth. Assuming the land is used for agricultural production and cannot be consistently sampled, this land would be classified as an emissions accounting area.

Subsection 9(2) allows for the inclusion of land that is not eligible in the project area as long as it is not included in a CEA or it has become ineligible and must remain part of a CEA due to the operation of subsection 17(5). Ineligible land included at the start of a project must either be mapped as an exclusion zone or emissions accounting area as required by subsection 17(3). Where an area of land less than 1% or 50 hectares becomes ineligible after project declaration, subsection 17(5) allows it to remain as part of an unchanged CEA. Ineligible land must also remain as part of a mapped CEA if the ineligible area is greater than the smaller of 1% or 50 hectares, where the most recent values for total carbon stock change are negative.

Varying project areas

The intent of subsection 9(3) is to ensure that new CEAs added to a project area comply with the requirements of this determination for eligible land management activities under section 7 and eligible lands under subsection 9(1). CEAs from other determinations may not be compatible under the criteria for a CEA set out in section 17 and would not meet the requirements of the method.

The intent of subsection 9(4) is to define the circumstances under which the project area, as defined at project registration, may be varied (as provided for under section 29 of the Act) and remain as an eligible offsets project. This is to ensure the impacts of undertaking a project are captured. For example, if a project activity incorporates clay which has been sourced from a pit on another piece of land, the land from which the clay has been sourced and to which it will be added to, must be captured in a CEA of the project throughout the project period. This means if soil carbon stock declines in the CEA containing the clay pit, this will be captured in the net abatement calculations for the entire project.

Under some circumstances a project area may need to be varied to remove some land from the project. A project area variation may include removing a CEA. A project area variation is straightforward and can be undertaken where the first offsets report has not been submitted, or the land to be removed is an exclusion zone or an emissions accounting area, or the whole project area becomes part of another eligible offsets project.

It is not possible to vary a project area after the baseline sampling round, as to result in a partial removal or change of a CEA boundary. After the baseline sampling round, only whole CEA area removals are allowed, in compliance with section 9.

Section 17 does not limit the operation of section 9. For example, a CEA with greater than 1% forest cover after declaration and negative sequestration values, can still be removed under subparagraph 9(4)(d)(i)(A), where the sum of all CEAs to be removed is positive.

Varying a project area is less straight forward when the land to be removed from a project is small. Examples of this include sale of a paddock or unintentionally defining CEA boundaries across separate land titles. As CEA boundaries need to remain unchanged throughout the project period, once a baseline sampling round has been conducted, if land must be removed from a project area, the entire CEA(s) that land is part of must be removed. In the example in Figure 1, as the land to be removed covers land in CEA 1 and CEA 2, both CEAs would need to be

removed from the project area. This is because soil carbon stock change is calculated on a CEA basis.

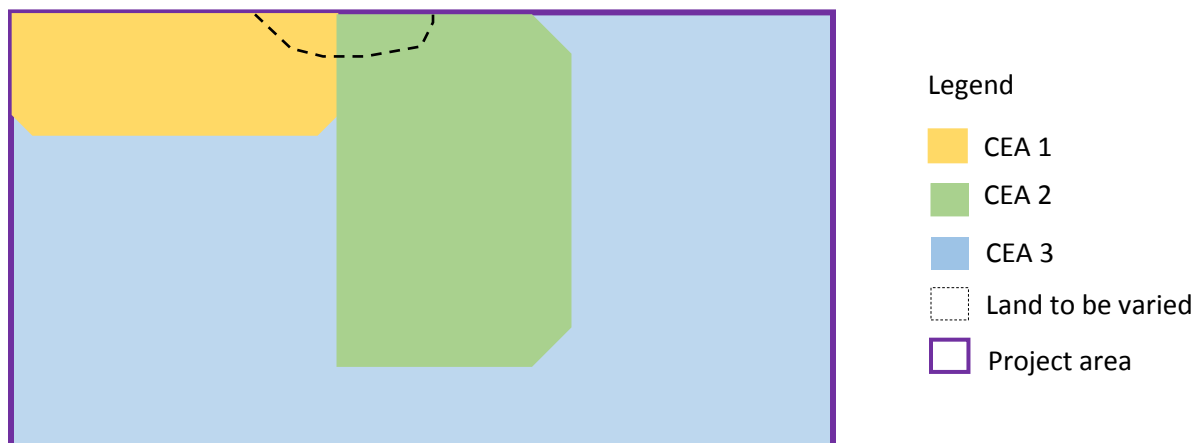


Figure 1: Example of project land which needs to be removed from a project area.

Subparagraph 9(4)(d)(i) sets further possible conditions that allow one or more whole CEAs to be removed after the first offsets report has been submitted.

A project proponent may utilise subparagraph 9(4)(d)(i)(A) to remove, for any reason, one or more whole CEA/s after the first offsets report has been submitted provided the combined sequestration value for all CEAs to be removed is positive. This allows project proponents to remove poor performing CEAs provided that the sum of all CEAs to be removed has an overall net positive value, as calculated in equation 27 or equation 40 of Schedule 1. This ensures that net abatement for a project cannot be increased by removing only poor performing areas. This mitigates the risk that project proponents may seek to game the method by removing one or move poor performing CEAs for the purpose of increasing the credits they are eligible to receive under the Act, while maintaining some flexibility for landholders who may need to remove one or more CEA/s after the first offsets report.

Project proponents can also remove one or more CEAs after the first offsets report under subparagraph 9(4)(d)(i)(B), regardless of their sequestration value, if removal is determined to not be for the purpose of increasing the credits issued under the Act.

Subparagraph 9(4)(d)(ii) needs to be considered when removing one or more whole CEAs. The subparagraph provides that when removing one or more whole CEAs that has had carbon moved from it to another CEA, then that other CEA that has received the carbon must also be removed. This means that if soil or vegetation (e.g. crop residue) is redistributed from one CEA to another then both the source and destination CEA must be removed. This is to prevent crediting for non-genuine abatement that is a result of moving carbon around a project site.

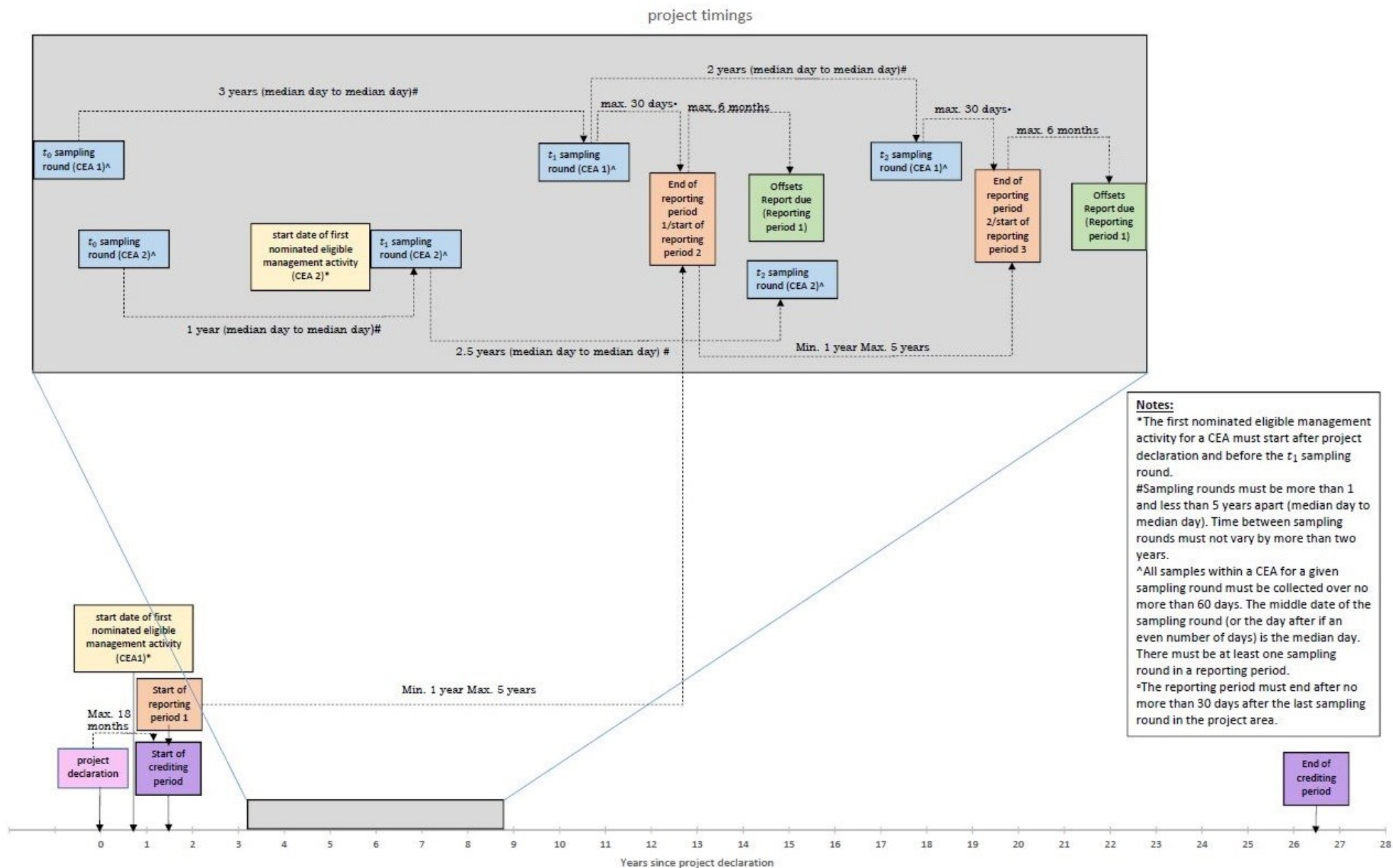
When part of a project area is varied, soil carbon stock and emissions baselines need to be recalculated. Overall, the restrictions in this section support the integrity of the calculations in the method and help the determination comply with the offsets integrity standards.

10 Activities to be conducted

Section 10 specifies the requirements for conducting eligible management activities. Specifying these conditions is to ensure that project proponents undertake the eligible management action as intended, without restricting business operations.

Subsection 10(1) requires at least one eligible management activity must be carried out or maintained on all land included in a CEA, until the end of the permanence obligation period for the project. Proponents are not restricted to undertaking only one eligible management activity. It is recognised that the soil carbon benefits may be compounded by undertaking more than one eligible management activity. It is also recognised that there may be other land management activities not specified in the determination, but when combined with an eligible management activity, will have a greater benefit on soil carbon stocks. The eligible management activity may change for an area of land over time, so long as during each reporting period one of the activities listed in section 7 is conducted or maintained. This allows for once-off activities that have continuing impacts (e.g. water-ponding).

Subsection 10(2) describes the timing for implementing the first eligible management activity in the context of project declaration, crediting periods, sampling and project reporting. Figure 2 provides a graphic overview of the relationships between critical dates and time periods in a project.



To prevent potential leakage of emissions as a result of implementing the project by shifting livestock production to areas not covered by the soil carbon project, subsection 10(3) requires that land used as a permanent pastures or pasture for a period of at least 2 years within CEA must be grazed, or intended to be grazed by production livestock at least once during a 2 year period. The intention of grazing is included to cover exceptional circumstances where grazing would not be unsustainable (e.g. grazing during severe drought leading to land degradation), but would have occurred under normal circumstances.

Subsection 10(4) allows for management actions other than those defined as eligible management activities under section 7, to be undertaken. The exception to this, is those activities excluded under section 11 or activities outside of the criteria defined under section 12.

Management actions other than those defined as eligible management activities, may or may not be targeted at increasing soil carbon but are part of regular land management activities. The allowance of additional management activities in conjunction with eligible management activities is to prevent restriction on business operations and is in recognition that there may be other land management activities not specified in the determination, when combined with an eligible management activity, may have a greater benefit on soil carbon stocks.

11 Activities not to be conducted

Section 11 excludes certain other activities being carried out during the period between the declaration of the project and the end of the permanence obligation period for the project. These excluded activities must not be carried out on land that is or is to be, part of a CEA.

De-stocking of land under pasture paragraph 11(2)(a), does not preclude lowering a stocking rate, but not such that it would conflict with the requirements of subsection 10(3). That subsection requires that land that is used as pasture, either permanently or for a pasture phase of two years, must be grazed at least once every two years. De-stocking is defined in section 5 of the Determination.

Application of ineligible non-synthetic fertilisers is excluded under paragraph 11(2)(b). The determination restricts the use of some non-synthetic fertilisers (e.g. crop residue, hay, straw). This is because removing biomass from an area that is not part of the project, can potentially reduce soil organic carbon stocks, reducing the net environmental benefit from the project. If the non-synthetic fertilizer was sourced from within a CEA that is part of the project, this section does not apply. Potential losses in soil carbon as a result of removing biomass will be reflected in the soil carbon estimates for the CEAs within the project.

The section also does not apply to non-synthetic fertilisers if it formed part of a designated waste stream. This means it would have been removed from the area regardless of the project (for example, straw that was used as poultry bedding). In that case it can be assumed that the project will not cause a decrease of soil carbon stocks through the removal of biomass.

Any material that undergoes pyrolysis that does not meet the section 5 definition of biochar, is not to be applied in a project under paragraph 11(2)(d). This specifically excludes the application of pyrolysed material that is not organic or organic material such as tyres, and human effluent.

Subsection 11(3) requires land management activities must not disturb the soil below the sampling depth that is required under section 19. This is to allow for once off activities such as water ponding and clay incorporation to be undertaken, but to prevent introduction of carbon from outside of the sampling depth and artificially raising the soil carbon value measured.

Under subsection 11(4) land management activities on hypersulfidic soils that result in the application of lime, drainage or physical disturbance, are not to be conducted. These activities would likely increase nitrous oxide emissions from these soils and reduce the net environmental benefit from the project.

Subsection 11(5) provides that an activity notified under subsection 11(6) by the regulator to the project proponent cannot be conducted. Under subsection 11(6) the Regulator may notify a project proponent of activities that must not be undertaken. This is to control for activities that have not been accounted for in sections 10, 11 or 12 and are expected to result in the crediting of non-genuine carbon abatement. This may include activities that distort sampling analysis, artificially inflate soil carbon analysis or result in the production of material emissions that are not accounted for in the net abatement calculations. The Regulator must consult a project proponent on the need to make such a notification, before making the notification.

12 Restricted activities

Activities in this section may only be undertaken on land that is, or will be, part of CEA, from project declaration to the end of the permanence period, if the conditions of the section are met.

Woody vegetation may only be cleared or thinned if the requirements in subsection 12(2) are met. This is because clearing of woody vegetation from CEAs removes carbon that had previously been sequestered in the vegetation biomass. If the clearing of woody vegetation occurred as a result of the project, then this release of carbon would offset the carbon subsequently sequestered in the soil. The provisions under subsection 12(2) do not apply to areas outside of CEAs but does apply to land that is to be added to the project after project declaration. Land that met the forest land definition during baseline or at project declaration, should be classified as ineligible land and not incorporated into a CEA.

Paragraph 12(2)(a) requires clearing or thinning of woody vegetation must be undertaken in accordance with any applicable regional natural resource management plan and Commonwealth, State, Territory or local government environmental and planning laws. This is to ensure that the clearing or thinning is done in accordance with legal requirements and that it is consistent with the desired outcomes from the regional natural resource management plan. If a proponent carries out clearing or thinning of woody vegetation in accordance with a valid clearing permit in force before the land became part of a soil carbon project, then it is assumed that the clearing would have occurred in the absence of the project and so these emissions are not accounted for as project related emissions. Failure to obtain regulatory approvals may affect a project's status as an eligible offsets project.

The circumstances in which clearing and thinning are allowed to be undertaken are provided in paragraph 12(2)(b).

Subsection 12(3) requires that non-synthetic fertiliser is only applied to the land if it meets the timing requirements for sampling rounds in the determination and the Supplement.

Subsection 12(4) provides for implementation of activities that involve the addition or redistribution of soil using mechanical means (including clay delving, clay spreading or water ponding).

Paragraph 12(4)(a) means the soil added or redistributed using mechanical means must come from CEAs that are part of the project. This ensures the carbon content of the soil being added or redistributed is accounted for and leakage from outside of the project is avoided.

To prevent bias in the results of soil organic carbon analysis, paragraph 12(4)(b) requires the sampling depth to be greater than the depth of soil sourced for the land management activities. This ensures that credits are generated only as a result of the activity and that any losses from redistributing the soil from one area to another is accounted for.

Paragraph 12(4)(c) requires that a site where soil is removed must be remediated as soon as practical. The determination notes that remediation could involve returning the sandy topsoil to a clay pit immediately after the clay is extracted. The remediated land is part of a CEA and as such, is subject to the requirements of section 10, in that the project proponent must carry out or maintain at least one eligible management activity until the end of the permanence obligation period for the project.

Under subsection 12(5) the use of soil amendments containing biochar is allowed under certain conditions. In a State or Territory where the use of biochar as a soil amendment for agricultural use is permitted, a licence or permit must be obtained. Where a license or permit is not attainable under subparagraph 12(5)(a)(i), a written statement from the head (or delegate) of a responsible environmental protection agency to apply biochar, must be obtained under paragraph 12(5)(b). Failure to obtain regulatory approvals may affect a project's status as an eligible offsets project if biochar is then applied.

The approval under paragraph 12(5)(a) requires that when applying for a written statement, it must be clear that the applicant is requesting approval to apply biochar as described in this determination, the quantity and frequency of biochar to be applied, the area of land the biochar is to be applied to, and the feedstock for the biochar is explained. The written statement from the head or delegate of the responsible environmental protection agency must give specific approval and consent to the activity to be undertaken.

Paragraph 12(5)(b) ensures that biochar production does not result in leakage or loss of biomass or carbon, that is not accounted for.

Application of biochar is not defined as an eligible management activity under subsection 7(2). Project applications to the Regulator will not be able to rely on these activities to support project registration.

Subsection 12(6) limits the application of additional irrigation water after the baseline sampling round. In some instances, if a proponent sources additional water by securing newly acquired water from an in-stream water or groundwater water access entitlement or irrigation right, rather

than irrigation efficiency savings, a potential carbon leakage risk arises. In some cases, such as fully allocated catchments, the entitlement may have been acquired from another irrigator resulting in displaced biomass growth. Although the project area in which the management action is undertaken will experience an increase in soil carbon, a different area of land outside of that project area may no longer be used to grow irrigated crops or pasture—potentially leading to a reduction in soil carbon that could offset project sequestration.

Given the difficulty of quantifying the magnitude of the leakage risk, and the fact that the likelihood of leakage occurring can vary considerably depending on the catchment in which the project is operating, subsection 12(6) limits additional irrigation to the quantity used during the baseline period, within a margin of error to control for increases in irrigation, unless it meets the definition of ‘new irrigation’.

Paragraph 12(6)(a) allows for irrigation where the annual level for a project area or CEA is no more than 20% than the highest annual level of irrigation in the baseline period and 5-yearly level of irrigation is not more than 10% greater than the highest 5-yearly total level of irrigation in the baseline period. These two restrictions limit the influence of a high levels of water application before a baseline sampling round and restricts long term increases in irrigation, unless it meets the section 5 definition of new irrigation. Where projects have not applied irrigation during the baseline period, irrigation cannot subsequently be applied to a project area or CEAs. The baseline irrigation is project area or CEA specific and cannot be applied to other project areas or CEAs.

Paragraph 12(6)(b) allows for application of irrigation above the amounts specified in paragraph 12(6)(a), where the deduction of the amount of new irrigation (as defined in section 5), results in the total irrigation amount complying with paragraph 12(6)(a).

13 Land management strategy

Section 13 establishes the requirement for projects to prepare, review or revise if necessary a land management strategy. The Land Management Strategy intends to provide an ongoing assessment of possible risks, ongoing monitoring, and improvements to management activities, to account for site and business specifics of each project.

The purposes of the Land Management Strategy in this method is to help:

- manage expectations about the potential to increase soil carbon for their project site. This is important as the list of eligible management activities in paragraph 7(2)(a) are potential new management actions that are likely to build soil carbon, but need to be considered in the context of a range of site conditions;
- ensure alignment between long-term farm business objectives and a soil carbon project, particularly given the permanence obligations on the landholder;
- ensure all relevant parties are aware of the risks and their obligations in under-taking a project.

The land management strategy is similar to existing land management plans in many instances. The proponent and landholder in instances where the proponent is not the landholder, may

choose to prepare a dedicated soil carbon project land management strategy or build on existing land management plans. It should also be noted that while a land management strategy requires ongoing reviews, the work required to revise a strategy will be dependent on the extent of any changes that may be required. For example if land management activities are not changing in a project area, then it is likely that a review will not identify any required changes, and may not require revision.

Subsection 13(1) creates a requirement for an independent person to prepare or review one or more written land management strategies. The requirement for a land management strategy to be prepared or reviewed by an independent person ensures landholders receive advice that takes into account soil carbon objectives as well as the broader long term business objectives. The land management strategy must cover the implementation of all eligible land management activities and consideration of all other land management activities to be carried out in the soil carbon project until the end of the permanence obligation period. Where implementation of management activities deviate from the Land Management Strategy, the strategy should be updated and the Regulator notified.

A review might be created by another party that is not the independent person, but must be reviewed by the independent person. The independent person is required to provide their own documentation and consider the strategy under the requirements of subparagraphs 13(1)(c)(ii) and 13(1)(c)(iii).

Paragraph 13(1)(a) requires the strategy to demonstrate that eligible management activities satisfy the requirements in subsection 7(2). This requires the land management strategy to establish that the eligible management activities are either new or materially different from the land management activities undertaken during the baseline period and that soil carbon can reasonably be expected to be sequestered in that system as a result of carrying out the eligible management activity. The reasonable expectation to increase soil carbon should consider the eligible management activity in the context of current peer-reviewed scientific literature, project specific factors (e.g. soil type, climate, rainfall etc.), historical land management, and other factors that may influence soil carbon sequestration.

Paragraph 13(1)(b) outlines that the management strategy must ensure that each CEA has at least one eligible management activity carried out or maintained from when the first eligible management activity must be implemented by (see Figure 2) until the end of the permanence obligation period for the project. All CEAs within a project must be covered by a land management strategy, but this can be either in a single strategy or multiple strategies for a project. All land within a given CEA must be covered by a single strategy.

Paragraph 13(1)(c) sets out the requirements to document and take into account when developing the land management strategy, the impact of activities that are not defined as eligible management activities (such as the application of biochar) and limitations to increasing soil carbon stocks within each CEA. Subparagraph 13(1)(c)(ii) should consider the combined influence of site and environmental factors (e.g. soil structure, topography, climate, rainfall etc.) when determining the capacity and suitability of eligible management activities to sequester

carbon under these limitations. Consideration should be given where land management activities outside of eligible management activities might impact the capacity to sequester soil carbon. Limitations may include soil properties such as soil structure and sodicity, environmental factors and micronutrients.

The risk to soil carbon sequestration over time from climate influences and land management activities must also be documented and taken into account when developing the land management strategy. This is especially important during the permanence period and consideration must be given to the overall impact of all land management activities and the ability to verify that carbon sequestered during the crediting period is likely to be retained during the permanence obligation period for the project.

Paragraph 13(1)(d) provides for the land management strategy to specify any additional steps the project proponent needs to take to monitor the project or additional records that would go to verifying to objectives of the land management strategy and how they are being achieved.

Under paragraph 13(1)(e) the independent person is required to state that those activities specified by the determination under section 11 are not to be carried out and restricted activities are not going to be carried out unless in accordance with section 12. The independent person is to state that the eligible management activities to be implemented are an improvement upon the land management activities with regards to improving soil carbon stock and the overall impact of all land management activities conducted on the land could reasonably be expected to improve soil carbon stocks.

Subsection 13(2) makes it a requirement for all of the land included in the CEAs for a project to be covered by a land management strategy. It also provides a requirement that a single strategy covers all of the land in a CEA. Therefore if a project has more than one land management strategy, then all CEAs must only have one strategy that apply to it.

Subsection 13(3) specifies timings for the submission of the initial land management strategy. Paragraph 13(3)(a) applies to projects that transition onto this method via an application under s128 of the Act and requires them to submit before the first offset report is submitted following the application. Paragraph 13(3)(b) requires that otherwise projects must submit their land management strategy before submitting an application under section 22.

Subsection 13(4) specifies requirements for when a project area is added to an existing project. Where this occurs either one or more strategies must be revised to cover the additional area or one or more new strategies must be prepared to cover the additional project area. One of these must occur before the section 29 application is submitted to vary the project area through the addition of the new project area.

Subsection 13(5) places obligations on the project proponent and each relevant landholder in relation to the land management strategy. They are required to sign and agree to implement or oversee implementation of each management strategy and to take reasonable steps to implement the strategy until the end of the permanence period for the project. In the case that the project

proponent and the landholder are the same person then they will only need to sign and agree once.

Each land management strategy must be reviewed, and if necessary revised, as required by subsection 13(6). An independent person is to review, and if necessary revise, at least once during each reporting period until the end of the crediting period (excluding the first reporting period). There must be a maximum of five years between each review. The extent of work required to revise a land management strategy is expected to be related to the changes to farm management through time, changes in objectives and how the project is tracking. For some projects it is expected that reviews will be a straightforward exercise and possibly require no change to the land management strategy. After the end of the crediting period, the land management strategy must be reviewed, and if necessary revised, by an independent person, at least every 10 years until the end of the permanence obligation period for the project. Paragraph 13(6)(c) requires an additional review for each time land management activities being conducted are materially changed from those outlined in the applicable land management strategy. This is not restricted to eligible management activities and will apply to all land management activities being carried out. Paragraph 13(6)(d) provides for the Regulator to notify a project proponent that a particular issue needs to be addressed in the strategy. The Regulator must give the project proponent at least three months to address an issue.

Subsection 13(8) specifies who is an independent person for the purposes of preparing a land management strategy. In addition to the requirements in the subsection, paragraph 13(8)(e) specifies that any requirements included in the Supplement must also be met. A note is included to make clear that being paid for preparing a land management strategy would not be considered to be a breach of paragraph 13(8)(d).

There is no requirement for the independent person to hold a formal qualification. This is to allow for those who may have adequate expertise without having formal training and also due to the large number of possible qualifications that may provide a person with the required knowledge.

14 Information to include in applications relating to the project

Subsection 14(1) provides that, when applying for declaration as an eligible offsets project under section 22 of the Act, or applying to vary the project area (as provided for under section 29 of the Act) or approval to transition from one method to another (as provided for under section 128 of the Act) a project proponent must include:

- a detailed description of the land management activities that were carried out during the baseline period;
- a detailed description of the eligible management activities that will be carried out as part of the project until the end of the permanence period;
- a detailed explanation of how the land management activities to be carried out satisfy the requirements to be eligible management activities in subsection 7(2);

- evidence that all of the land included, or to be included, in a CEA is eligible land; and
- if biochar is to be applied, evidence that the requirements of subsection 12(5) have been met. That is, a licence or permit or where a license or permit is not attainable a written statement from the head (or delegate) of a responsible environmental protection agency.

Subsection 14(2) requires those projects applying for declaration as an eligible offsets project under section 22 of the Act, or applying to vary the project area (as provided by section 29 of the Act) to include copies of the initial land management strategies.

Subsection 14(2) does not require a project transitioning under section 128 to include a copy of the land management strategy during application. Transitioning projects will be required to provide a valid strategy in accordance with subsequent timing requirements.

Subsection 14(3) requires that the Regulator must accept the land management strategy applicable to the project under section 13, in order to be declared an eligible offsets project.

Division 2 - Operation of soil carbon projects

Subdivision 1 - Operation of division

15 Operation of eligible projects

Section 15 specifies that a soil carbon project that is an eligible offsets project must be operated in accordance with this Division.

Subdivision 2 - Project accounting

16 Steps involved in accounting for a soil carbon project

Section 16 specifies the steps involved in accounting for a soil carbon project.

The following should be noted about certain elements in subsection 16(1):

- The note makes it clear that two sampling rounds are required to be conducted in the first reporting period, the baseline sampling and a subsequent sampling round. These two sampling rounds are the minimum required. Multiple subsequent sampling rounds may be conducted during the same reporting period. Sampling more frequently than the minimum requirement can reduce the uncertainty of the soil carbon stock estimates. This does not change sampling frequency requirements. Sampling is not conducted on exclusion areas or emissions accounting areas.
- Paragraph 16(1)(d) requires that for each sampling round, each CEA must be divided into strata consistent with any requirements in the Supplement. The Supplement provides a number of requirements and recommendations for stratifying CEAs. The Supplement provides an option for unequal stratification.
- Paragraph 16(1)(e) requires that for each reporting period, all CEAs within a project area must have the same number of sampling rounds.

Subsection 16(2) allows a project proponent to apply to the Regulator to seek an extension of time to carry out a subsequent sampling round if exceptional circumstances prevent sampling within the timeframes specified in the Supplement. Otherwise the section specifies that the timeframes within the Supplement apply.

Examples of exceptional circumstances may include environmental limitations on sampling such as soil moisture levels being too low or too high to enable accurate sampling, weather events such as heavy rain or fire inhibiting access to the site, or unexpected circumstances rendering soil sampling technicians unavailable. Exceptional circumstances may also extend to personal circumstances.

Evidence may be provided to the Regulator in support of an application for an extension of time. The evidence could include a statutory declaration from the soil sampling technician stating that the conditions are unsuitable for soil sampling, photos of the flooded area or weather reports.

Paragraph 17(1)(b) requires that areas within the project area that are not connected (non-contiguous) must be mapped as separate CEAs. A CEA may, however, be non-contiguous provided it does not cover more than one part of a non-contiguous project area. Figure 3 includes two examples of carbon estimation area distributions which would be allowed (figure 3 (a&b)), and two examples of carbon estimation area distributions which would not be allowed (figure 3(c&d)).

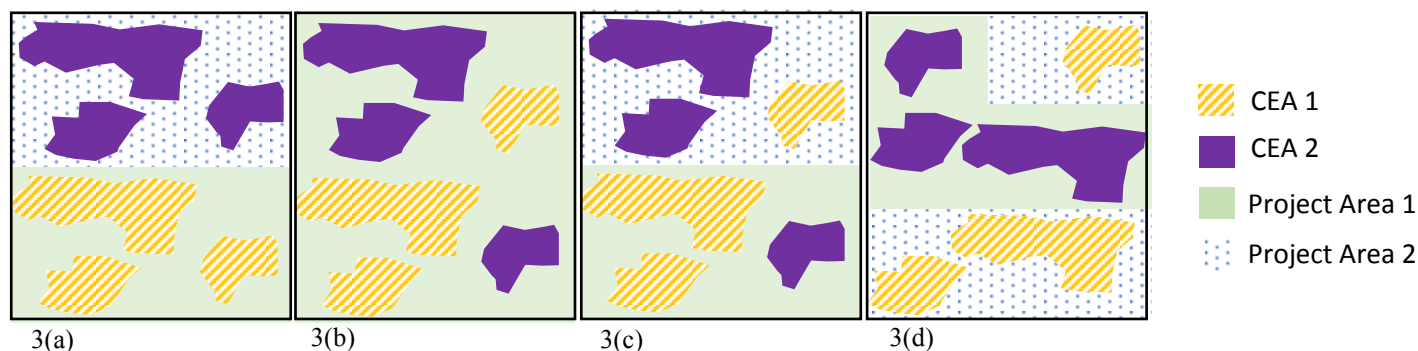


Figure 3: Examples of the relationship between project areas and carbon estimation areas. In all examples CEA 1 and CEA 2 are made up of three non-contiguous parts: (a) shows each CEA is contained entirely within a contiguous project area; (b) shows two CEAs contained within one project area; (c) shows both CEAs have area across two project areas; (d) shows each CEA is contained entirely within a contiguous project area however, the project areas are non-contiguous.

Paragraph 17(1)(c) specifies that once boundaries of a CEA have been used for the baseline sampling round, they cannot change.

Subsection 17(2) provides for land to be excluded from the project area into areas called **exclusion areas** provided certain circumstances apply. These circumstances are either no land management or agricultural activities are to be conducted in the area or the land is forest land where no emissions occur that are relevant to the calculations in Schedule 2. Forest land is as defined in section 5 of the determination.

Exclusion areas refers to land that is within the project area but that is excluded from estimates of net abatement. Structures used for workshops, packaging and storage are not considered agricultural activities.

An exclusion area may adjoin, or be contained within the boundaries of, a carbon estimation area. Exclusion areas within the project area must not contain productive land; that is, the land must not be used for primary production. This is because emissions are not accounted for in the exclusion areas, posing a risk of leakage as a result of the project.

Subsection 17(3) states that any land within a project area which is neither a CEA nor an exclusion area is to be considered as an **emissions accounting area**.

The note states that the carbon stock change in an emissions accounting area is not included in the net abatement calculations. Emissions from these emissions accounting areas will, however, be included in the net abatement calculations for the project area in addition to emissions and soil organic carbon stock change from carbon estimation areas.

Areas of forest land that have emissions that are relevant to the calculations in Schedule 2, should be included in an emissions accounting area.

Emissions accounting areas are likely to include agricultural land which is not suitable or conducive to sampling.

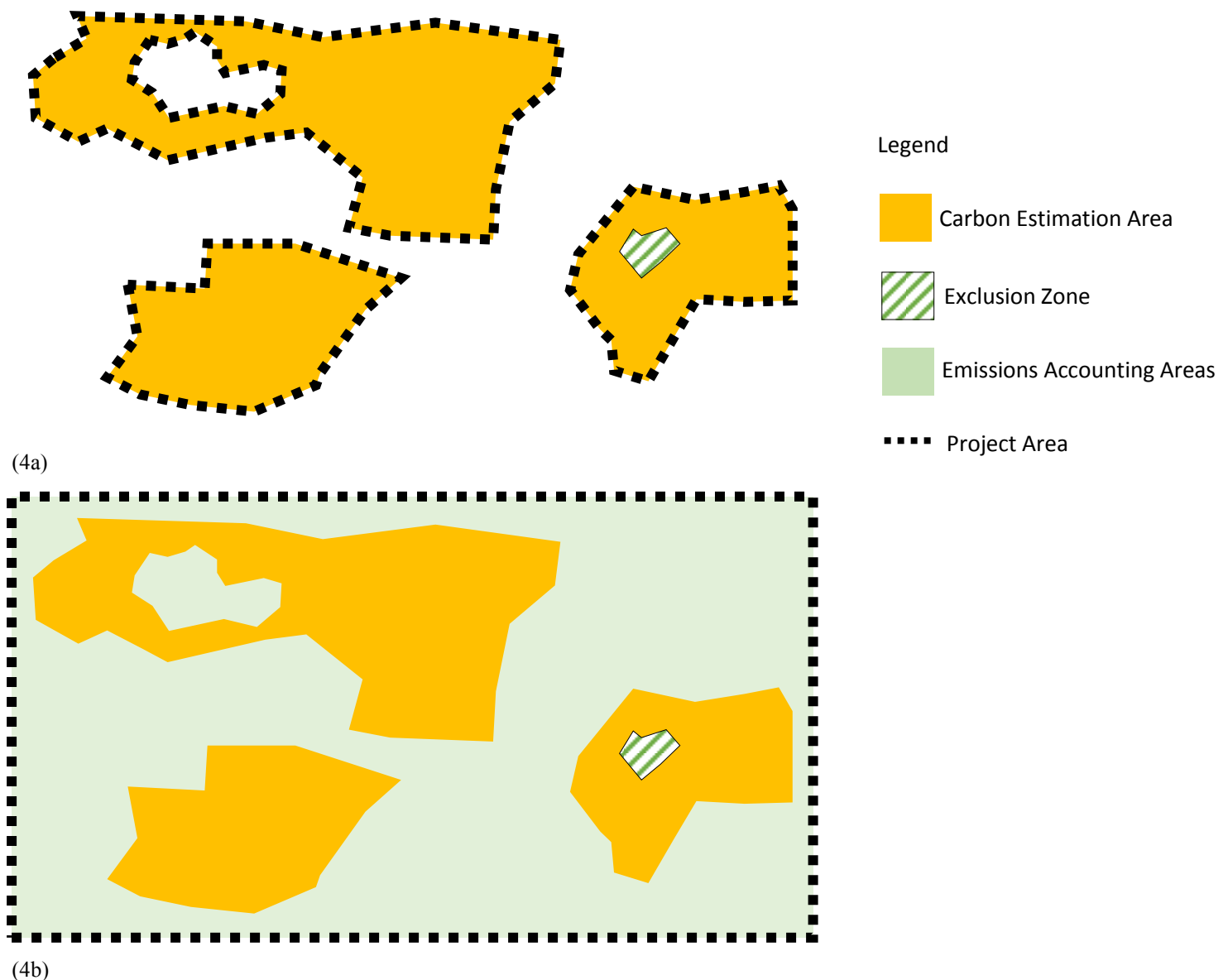


Figure 4: Examples of the relationship between a project area, carbon estimation area exclusion zones and emissions accounting areas with different strategies of defining project areas. (a) Defines the project area to closely match the Carbon Estimation Areas; (b) defines the project area more broadly.

It is recommended where possible, to define your project areas as closely as possible to your Carbon Estimation Areas (see figure 4a). Project areas may be defined broadly, however, the area in which your emissions are accounted for (carbon estimation areas + emissions accounting areas) would be much larger (figure 4b).

Subsection 17(4) specifies that subsection 17(5) and 17(6) apply to a CEA if all of the following three conditions are met:

- the CEA has been mapped in accordance with section 17; and
- the CEA includes land that is not eligible, or has ceased to be eligible as it has become forest land (as defined by the determination)(paragraph 9(1)(b)), or has ceased to be eligible as there are now dwellings or structures on the land (paragraph 9(1)(c)); and
- the CEA has not been removed from the project area of the project.

If these conditions are met, then subsection 17(5) may apply if any one of the three further conditions are met. Where subsection 17(5) applies a CEA must continue to remain as an unchanged part of a project area. For subsection 17(5) to apply, one of the following further conditions must be met:

- the area that becomes ineligible as a result of becoming forest land or being covered by dwelling or structures is less than the smaller of 1% or 50 hectares of the area of the CEA (e.g. for a CEA of 100 hectares this limit would be 1 hectare, but for a CEA of 10,000 hectares the limit would be 50 hectares); or
- the most recent soil carbon stock change (as calculated by equation 27 or equation 40) for the CEA is negative. This would occur if the soil carbon stock change has decreased from the baseline; or
- the Regulator has made a determination under subsection 17(7) that the land can continue to be mapped as a CEA.

Where one of these conditions are met for a given CEA, then that CEA must continue to remain unchanged. This means that it will remain part of the project area of the project as originally mapped and sampling will be required to continue. The purposes of subsection 17(5) are to allow project proponents some flexibility to construct dwellings or structures and to prevent the potential for proponents to remove negatively performing CEAs by contravening section 9 requirements by changing land use. The changes in land use are considered immaterial, and as such there is no adjustment to the calculation of soil carbon stock change. Where subsection 17(5) does not apply, subsection 17(6) would apply.

Subsection 17(6) makes it a requirement that a CEA must be removed from a project area where the conditions are met in subsection 17(4) but not met in subsection 17(5).

Subsection 17(7) provides criteria for the Regulator to potentially make a determination on whether or not a CEA should continue to remain mapped as a CEA. It is the Regulator's discretion to apply subsection 17(6). If the regulator makes a determination that a CEA should remain mapped as a CEA then subsection 17(5) will apply to keep it as an unchanged part of the

project. The Regulator may make a determination if all of the following specified criteria are met:

- a) the regulator has consulted with the project proponent about making the determination; and
- b) the continued mapping of the CEA is unlikely to result in the crediting of non-genuine abatement; and
- c) either of the following applies:
 - (i) it can be reasonably expected that, within five years of detection of forest cover (exceeding 1%) in a CEA, less than the smaller of 1% or 50 hectares of the area of the CEA will be forest land; or
 - (ii) less than 5% of the area of the CEA is forest land or is covered by dwelling and other structures; and
- d) the Regulator considers that the continued mapping of the CEA is appropriate having regard to all the circumstances.

The Regulator may have regard to circumstances and influences outside of those listed in 7(a), 7(b) and 7(c).

Transitioning projects from the *Carbon Credits (Carbon Farming Initiative) (Sequestering Carbon in Soils in Grazing Systems) Methodology Determination 2014*, may be impacted by this provision due to forest cover within a CEA. The less than 5% provision is designed to increase the likelihood that transitioning CEAs are eligible under the new method, but not to the extent that would compromise the eligibility of carbon abatement under the method.

Subsection 17(8) specifies that mapping of each CEA, exclusion area or emission accounting area must be done in accordance with the Supplement.

A note in the section points out that projects that transfer from the *Carbon Credits (Carbon Farming Initiative) (Sequestering Carbon in Soils in Grazing Systems) Methodology Determination 2014* may need to remap their projects to ensure that they are in compliance with this section.

18 Sampling design

The supplement provides flexibility in how to design the sampling regime. As shown in Figure 5 (of this document), there are choices in stratification (equal or unequal area), the depth to which you can sample (must be at least 30 cm), the way you analyse carbon content and whether you composite or use individual cores for analysis. Each coloured line depicts a possible path you may take.

For example, if you choose to stratify unequally, you cannot follow the blue path. This is because the blue path leads into the option of compositing across strata, which is not possible with unequal area strata. Likewise, if you choose to analyse your samples using dry combustion analysis, you cannot follow the red path. This is because the red path passes through a soil sample which is prepared as an in-tact core at field moisture, which cannot be used as the sample preparation process prior to dry combustion analysis.

19 Sampling

Subsection 19(a) requires sampling to be undertaken to a minimum depth of 30cm. If sampling is undertaken to a depth greater than 30cm then paragraph 19(a)(ii) requires that separate information must be obtained for the 0 to 30 centimetre layer of the soil sample and the soil layer sampled to the depth greater than 30cm. This ensures abatement generated using the determination can be counted towards Australia's Kyoto Protocol target.

Subsection 19(b) requires that an independent person undertake the sampling and sets out who can qualify as an independent person for the purposes of sampling. One of these requirements is that the independent person cannot be the same person who prepares, reviews or revises the land management strategy. The independent person requirements for this section are different to the requirements to be considered an independent person for preparing a land management strategy under section 13.

Detail regarding soil sampling is located in the Supplement. This includes information on locating sample locations and extracting cores.

20 Sample analysis

Detail regarding sample analysis is located in the Supplement. This includes information on the measurement of soil carbon stocks using different approaches. The requirements and recommendations in the Supplement will differ from project-to-project depending on the approach used which will determine which parts of the Supplement are applicable.

A note in the section clarifies that although the technology used may change between sampling rounds, this does not change the requirement to use combustion analysis to calibrate and validate sensor models.

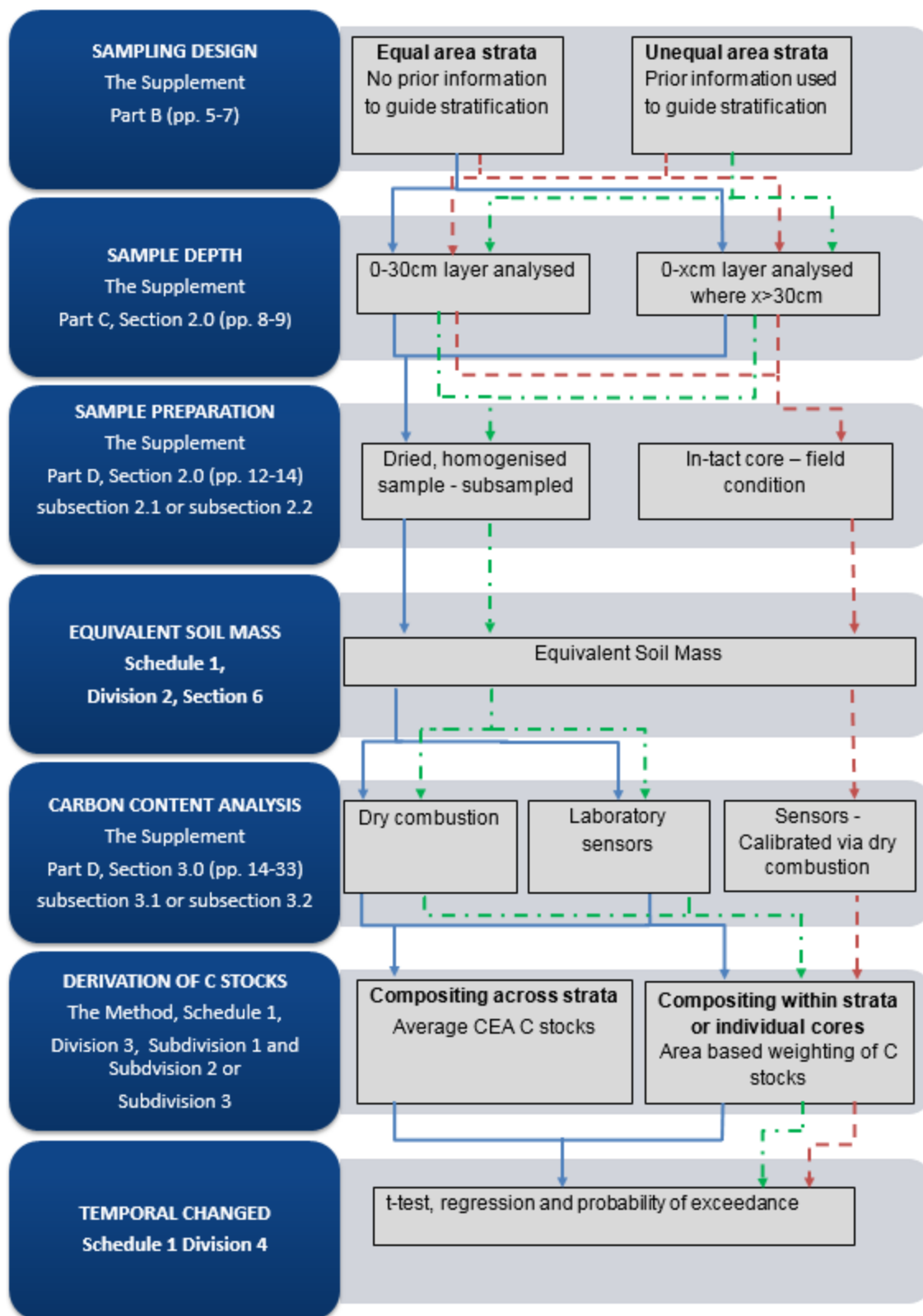


Figure 5: Overview from sampling design to determine temporal change of soil carbon stocks

Division 3 - Additionality

21 Newness requirement

A key requirement of the ERF is that credits are only issued for emissions reductions that are ‘additional’ – that is, emissions reductions would not likely have occurred under normal business conditions, in the absence of the ERF.

Section 21 specifies a requirement in lieu of the newness requirement under subparagraph 27(4A)(a)(ii) of the Act for soil carbon projects. The specified requirement is to ensure that the assessment of newness disregards any land management strategy that may be developed provided that eligible management activities contained within it have not commenced.

Section 21 clarifies that the project must otherwise comply with the ‘newness requirement’ set out in subparagraph 27(4A)(a)(i) of the Act.

Projects under the determination must meet the other additionality requirements of the Act. These are the regulatory additionality requirement and the government program requirement.

Part 4 - Net abatement amount

Division 1 - Preliminary

22 Operation of this Part

Section 22 of Part 4, details that paragraph 106(1)(c) of the Act specifies the method for working out the net abatement amount for a reporting period for a soil carbon project that is an eligible offsets project.

23 Overview of gases accounted for in abatement calculations

Section 23 describes the greenhouse gas sources and relevant carbon pools that are assessed in order to determine the net abatement amount. This is known as the ‘greenhouse gas assessment boundary’. The net abatement includes soil carbon pool within the carbon estimation areas in a project and other on-farm emissions sources that are directly or indirectly affected by the project. These sources and sinks are:

- soil organic carbon;
- livestock;
- synthetic fertiliser;
- lime;
- tillage events
- soil and landscape modification activities
- residues; and
- irrigation energy.

The effect of section 23 is that when making abatement calculations under Part 4, the carbon pools and emission sources and the corresponding greenhouse gases in the table in section 23 must be taken into account.

Not all sources and sinks within the greenhouse gas assessment boundary (carbon estimation areas and emissions accounting areas) must be accounted for in determining net abatement for a range of reasons. In some cases management will not affect the factors that drive emissions from a particular source. In other cases, although there is a change in management that relates to a particular source, the emissions that are released from that source in the project are, for all intents and purposes, likely to be equivalent to those that would have been released in the absence of the project. In some instances the emissions from a particular source may change, but there is no causal link between the project itself and the emissions, or the emissions are out of the control of the proponent. The rationale behind including each of the sources and sinks listed above or excluding other relevant sources and sinks from the net abatement calculations is set out below.

Soil organic carbon

This is the primary emissions sink within the project and the basis for crediting under the determination. Changes in this pool are included in calculations of abatement.

Livestock

Livestock emissions can change with increases or decreases in stocking rate or with changes to the quality of feed available. Livestock numbers are considered to be the primary driver of livestock emissions (enteric fermentation, dung and urine). Proponents must estimate changes in emissions resulting from increases or decreases in stocking rate compared to historic levels using methods derived from National Inventory Report processes.

Providing for proponents to calculate potential changes in livestock emissions due to different feed quality would overly complicate the determination and so the effect of dietary changes are not accounted for within the abatement calculations. This is considered conservative as most of the management actions under the determination could reasonably be expected to increase the quality of livestock feed and, hence, to slightly reduce livestock emissions.

Synthetic fertiliser

Several management actions (for example, nutrient management and pasture rejuvenation) may result in increased applications of synthetic fertiliser compared to a BAU scenario. Industry data shows that the majority of key fertilisers likely to be used in soil carbon projects are imported from overseas countries rather than being manufactured in Australia. As international carbon accounting rules require emissions to be accounted for at their point of generation, the determination does not account for emissions associated with the manufacture of synthetic fertiliser.

In accordance with the National Inventory Report, emissions of nitrous oxide from the application of synthetic nitrogenous fertiliser (and also of carbon dioxide from the application of urea) must be accounted for. Proponents must estimate changes in emissions resulting from increases in synthetic fertiliser application compared to historic levels using methods derived from National Inventory Report processes.

Lime

Several project management activities (for example, soil acidity management and pasture rejuvenation) may result in increased applications of lime compared to a BAU scenario. The National Inventory Report accounts for the carbon dioxide emissions that result from applications of either magnesium carbonate or calcium carbonate to agricultural soils. These emissions must be accounted for in the determination using the conservative default emission factor derived from National Inventory Report processes.

Non-synthetic fertilisers

Non-synthetic fertilisers, such as compost or manure, comprise materials from the waste streams of different processes (e.g. domestic green waste, cotton gin trash, grape marc, feedlot manure, chicken litter, food waste etc.). Emissions from the production of these materials are not

accounted for in deriving net abatement because these fertilisers are the by-product of other processes (such as intensive animal production) and their emissions would have occurred irrespective of the project.

The emissions associated with the application of non-synthetic fertiliser to land, any processing of feedstocks to form the value-added organic fertiliser (such as compost), and the subsequent decomposition of the fertiliser would be less than, or equal to, the emissions from the feedstock in the absence of the project. There is limited relevant Australian data on this issue. A US study found, however, that emissions associated with creating a compost from even high-nitrogen materials were ‘minimal’ compared to those avoided by the decomposition of the same material¹. The 2006 IPCC guidelines provide emission factors for both compost production and for spreading manure that are lower than for manure which is either stockpiled or disposed of to landfill². Therefore emissions from processing of organic waste feedstocks into compost and for applying non-synthetic fertiliser to soil do not need to be accounted for.

Residues

Residues from crops or pasture result in the release of nitrous oxide emissions when they are tilled into the soil. Some project management activities and management actions are expected to increase emissions from residues, such as: use of irrigation water on crops, rejuvenation of pastures and tillage of crops. The determination uses default factors and processes derived from the National Inventory Report to calculate changes in emissions from residues.

Soil landscape modification activities

Undertaking soil landscape management activities may involve a material increase in emissions due to diesel fuel use. These activities comprise the eligible management activities in subparagraphs 7(2)(b)(x) and 7(2)(b)(xi). Examples of these activities include clay delving and water ponding.

These activities are likely to involve the use of machinery to undertake significant earthworks. This could include excavation and haulage of material within CEAs. Fuel use for these activities must be recorded for accounting in net abatement calculations.

Irrigation energy

Irrigating previously non-irrigated areas may involve a material increase in emissions due to diesel fuel or electricity use, being the two main sources of energy for irrigation.

Other changes in energy use resulting from the project are likely to be immaterial. Fuel use associated with additional tillage is accounted for under residues and other project management actions, involving application of lime or fertiliser for example, are unlikely to increase fuel use to the point where it becomes a material source of emissions. Therefore fuel use and electricity use

¹ Brown, S Kruger, C & Subler, S 2008, ‘Greenhouse gas balance for composting operations’, *Journal of Environmental Quality*, 37(4), 1396-1410.

² Intergovernmental Panel on Climate Change (IPCC) 2006, *2006 IPCC Guidelines for National Greenhouse Gas Inventories*, volume 4, chapter 10, p.10.63.

emissions, other than for irrigation, are considered to be immaterial and are not accounted for in calculating net abatement.

Above ground woody biomass

Management actions undertaken as part of the project are unlikely to cause an increase in above-ground woody biomass. Project proponents are unlikely to allow woody biomass levels to increase significantly as this would potentially decrease the productivity of cropland or pasture. The sequestration values do not consider increases in above ground woody biomass and projects under the determination cannot be carried out in forested areas. Accordingly emissions from this source/sink are not accounted for in estimating net abatement.

Emissions may increase if the proponent clears an area of woody vegetation as a result of the project. The determination does not allow for woody vegetation to be cleared from a project area unless the clearing meets certain requirements that indicate that the clearing would likely have occurred at some point under a BAU scenario.

Fire- not included in emissions calculations

Management actions undertaken as part of the project are unlikely to lead to an increase in the frequency or intensity of (and hence emissions from) fire events. This is because woody biomass levels are unlikely to increase significantly and clearing of new areas of vegetation is subject to regulations. Some activities, such as stubble retention, will reduce emissions from this source where stubble is no longer burned. While there may be increased ground cover and pasture production due to sustainable intensification, there is also likely to be increased or similar levels of pasture growth utilisation through grazing. As such grass fire frequency and intensity is not expected to change significantly. Accordingly this source is not included within the abatement calculations.

Biochar- not included in emissions calculations

There is a high level of uncertainty over the stability of any biochar. In this project, biochar must be made by pyrolysing organic material that is sourced either from a designated waste stream, or a CEA from within the project. This means emissions do not have to be accounted for because they would have occurred in the absence of the project, even if the biochar (which is relatively stable) breaks down. As stability of this product is uncertain, the cumulative carbon added through the project is subtracted from the carbon stock at each sampling round. The carbon content of biochar will be considered to be 100% unless total carbon has been determined by laboratory analysis or a manufacturer's statement.

Division 2 - Calculation of net abatement amount- general

24 Overview

This section gives an overview of how carbon dioxide that is removed from the atmosphere and sequestered in soils is credited. The measured change in soil organic carbon between reporting periods is adjusted by an emissions adjustment to ensure any additional emissions occurring as a result of the project are accounted for in the net abatement calculations.

25 The net abatement amount, A

This section outlines the abatement for a project in a given reporting period by summing the abatement for all project areas in the project. Some examples of reasons to have multiple project areas within a project are if relevant areas of land are non-contiguous or additional areas of land are added to the project after declaration of the project as an eligible offsets project. This does not limit splitting land in a project into more than one project area for other reasons.

26 The net abatement for a project area, A_{PA}

This section outlines how changes in soil organic carbon and changes in emissions interact to give net abatement for a given reporting period for a given project area. The net abatement for a project area in the reporting period is adjusted by the emissions adjustment. The emissions adjustment (EA_{PA}) is:

- zero if the total change in emissions for the reporting period (calculated using equation 77 of schedule 2) are:
 - equal to zero (that is, there is no change in emissions compared to the baseline emissions period); or
 - less than zero (that is, there is a reduction in emissions compared to the baseline emissions period); or
 - equal to the value for project emissions buffer at the previous reporting period (Note. this includes any emissions reductions from all previous reporting periods that have not been used to offset any increases in previous reporting periods); or
 - less than the value for project emissions buffer at the previous reporting period.
- calculated using equation 3 if emissions for the reporting period (calculated using equation 77 of schedule 2) are:
 - Greater than the value for the project emissions buffer at the previous reporting period.

27 The project emissions buffer for a project area for a reporting period

This section outlines how to derive the project emissions buffer for a project area for a reporting period. When there is a decrease in emissions for the reporting period compared to the baseline emissions, net abatement is equal to the increase in soil organic carbon (calculated using schedule 1). Any decrease in emissions is added to the project emissions buffer. The purpose of

the project emissions buffer is to allow for reduced emissions from a reporting period, relative to the project baseline, to offset any increased emissions in subsequent reporting periods.

The project emissions buffer is calculated using equation 4 if emissions for the reporting period are:

- equal to zero (that is, there is no change in emissions compared to the baseline emissions period); or
- less than zero (that is, there is a reduction in emissions).

The project emissions buffer is calculated using equation 5 if emissions for the reporting period are:

- greater than zero but less than the value of the project emissions buffer of previous reporting periods $PEB_{PA,RP-1}$.

The project emissions buffer is zero if emissions in the reporting period are:

- greater than the value of the project emissions buffer of previous reporting periods $PEB_{PA,RP-1}$; or
- equal to the value of the project emissions buffer of previous reporting periods $PEB_{PA,RP-1}$.

Part 5 - Reporting, record-keeping, notification and monitoring requirements

The record-keeping requirements in the determination ensure that the activities and compliance requirements that occurred in a project during the baseline emissions period and the project period can be proven to the satisfaction of the Regulator.

The record-keeping requirements must also establish ‘newness’, support net abatement estimates, and verify that the land management strategy and land management activities have been undertaken in accordance with the determination.

There is no requirement for records to be kept in hard-copy format. It is acceptable for the records to be kept electronically.

Division 1 - Offsets report requirements

Part 5, Division 1, sets out information that must be included in an offsets report for a soil carbon project that is an eligible offsets project.

28 Operation of this Division

Paragraph 106(3)(a) of the Act provides that a methodology determination may require the project proponent of an eligible offsets project to comply with specified reporting, notification, record-keeping and monitoring requirements.

Under Parts 17 and 21 of the Act a failure to comply with these requirements may constitute a breach of a civil penalty provision, and a financial penalty may be payable.

The reporting, notification, record-keeping and monitoring requirements specified in a methodology determination are in addition to any requirements specified in the Act, regulations, and legislative rules.

29 Information that must be included in offsets reports

The following should be noted about certain pieces of information:

Subsection 29(1) sets out information that must be included in all offsets reports for the project.

Subparagraph 29(1)(f)(ii) requires the reporting of information for the 0-30cm separated from any information from the 0-xcm. This ensures abatement generated using the determination can be counted towards Australia’s Kyoto Protocol target.

Paragraph 29(1)(h) specifies that all reports must contain the information where it is specified or required under an applicable requirement under the Supplement.

Subsection 29(2) sets out the information that must be included in an offsets report for the first reporting period for the project.

Where the method specifies that certain information is only required in particular reports (for example, the first offsets report), it is not required to be provided in other reports.

Division 2 - Notification requirements

30 Operation of this Division

Paragraph 106(3)(b) of the Act provides that a methodology determination may require the project proponent of an eligible offsets project to notify one or more matters relating to the project to the Regulator for a soil carbon project that is an eligible offsets project.

Under Parts 17 and 21 of the Act a failure to comply with these requirements may constitute a breach of a civil penalty provision, and a financial penalty may be payable.

The notification requirements specified in a methodology determination are in addition to any requirements specified in the Act, regulations, and legislative rules.

31 Notification requirements

Paragraph 106(3)(b) of the Act provides that a methodology determination may specify requirements to notify the Regulator of one or more matters relating to the project.

For the purposes of paragraph 106(3)(b), section 31 of the determination sets out when project proponents must notify the Regulator. There may be other notification requirements in the Act, regulations, and legislative rules.

Subsection 31(3) outlines that if land management activities materially change after the end of the first reporting period, the Regulator must be notified of the change. This is to ensure the Regulator is aware of changes in activity that represent a risk to existing carbon stocks.

Subsection 31(4) requires that the project proponent must notify the Regulator of the intended, predetermined sampling location points, prior to the start of the sampling round.

Division 3 - Record-keeping requirements

32 Operation of this Division

Paragraph 106(3)(c) of the Act provides that a methodology determination may require the project proponent of an eligible offsets project to comply with specified record-keeping requirements.

Under Parts 17 and 21 of the Act a failure to comply with these requirements may constitute a breach of a civil penalty provision, and a financial penalty may be payable.

The record-keeping requirements specified in a methodology determination are in addition to any requirements specified in the Act, regulations, and legislative rules.

33 Record-keeping requirements:

Section 33 sets out specific record-keeping requirements for soil carbon projects. This information does not need to be included in offsets reports but may be requested at any time by the Regulator.

Paragraph 33(k) requires that if a project proponent changes an eligible management activity or other land management action from the land management strategy, the proponent must keep the information and evidence for each eligible project management activity or other land management action which the proponent has changed.

Division 4 - Monitoring requirements

34 Operation of this Division

Paragraph 106(3)(d) of the Act provides that a methodology determination may require the project proponent of an eligible offsets project to comply with specified monitoring requirements.

Under Parts 17 and 21 of the Act a failure to comply with these requirements may constitute a breach of a civil penalty provision, and a financial penalty may be payable.

The monitoring requirements specified in a methodology determination are in addition to any requirements specified in the Act, regulations, and legislative rules.

35 Monitoring requirements

Emissions must be monitored in the baseline emissions period and each reporting period as outlined in the table in section 35. The table lists each item to be monitored, its parameter, a description of the item, the units to be recorded, and any instructions.

Proponents may use zero as the emissions for the baseline emissions period for any or all emissions sources, in which case, the instructions do not apply for the baseline emissions period. Evidence must be provided, regarding any assumption or zero value.

If an assumed baseline is used for monitoring livestock, livestock must be monitored from project declaration and throughout the project period, using the provisions in section 36 for monitoring stocking rates.

To estimate the fraction of crop residue removed from the CEA, industry standard practices such as ground cover rating assessments can be used to determine what fraction of crop residues remain.

36 Project monitoring—livestock

Section 36 sets out monitoring requirements for livestock so that changes in emissions from this source can be calculated in accordance with Part 4 and the associated schedules of the determination.

37 Project monitoring—assumed baseline for livestock

In some circumstances a proponent may not be able to provide historical data to use section 36 project monitoring—livestock. This may be because the historical data cannot be accessed. In these cases, the proponent must use zero under subsection 4(2) of Schedule 2 or calculate baseline emissions using assessed carrying capacity—that is, an assumed livestock baseline.

Section 37 and schedule 2 equations 3 and 4, set out the general requirements for determining livestock emissions in the absence of baseline period emissions data. The section requires that the project proponent:

- obtains an assessment of carrying capacity for the relevant carbon estimation area expressed as a total number of animal units (for example, Dry Sheep Equivalent or Animal Equivalent) from the relevant government body or authority, for the purpose of subsection 37(2); and
- obtains an auditable description of the process that was used to calculate the carrying capacity of the relevant project area from the relevant government body, for the purpose of subsection 37(4).

Subsections 37(2) and 37(3) requires the relevant government body or authority to determine the carrying capacity for the site considering any available property-specific data and basing the assessment on:

- Subparagraph 37(3)(c)(i): the recommended pasture utilisation rate for the relevant district; and
- Subparagraph 37(3)(c)(ii): an assessment that the carrying capacity is sustainable over a minimum of 10 years; and
- Subparagraph 37(3)(c)(iii): the assumption that annual rainfall will be at the 10 year average for that district.

If an assumed baseline is used for monitoring livestock, livestock must be monitored from project declaration and throughout the project period, using the provisions in section 36 for monitoring stocking rates.

38 Project monitoring—land management strategy

The project proponent must monitor the implementation of the land management strategy in the project area. If a land management strategy specifies additional steps to monitor a project in accordance with paragraph 13(1)(d), those requirements must be met.

39 Consequences of not meeting requirement to monitor certain emissions sources

All emissions sources relevant to the project area and reporting period listed in the table in section 23 must be monitored. If records are not kept (as per the instructions in the table in section 35 (monitoring requirements)), no abatement may be recognised for the reporting period.

Subsection 39(1) does not apply if the Regulator determines that the failure to monitor the parameter is likely to have only a minor or trivial impact on the value of APA or alternative means have been applied to calculate a conservative estimate of the parameter. The Regulator must also determine the project proponent is taking steps to monitor the parameter consistently with the monitoring requirements in subsequent reporting periods.

This determination does not prevent the Regulator from taking action under the Act, or regulations or rules made under the Act, in relation to the project proponent's failure to monitor a parameter as required by the determination.

Part 6 - Partial reporting

40 Partial reporting

Section 77A of the Act provides that a project may be divided into two or more specified parts for the purpose of reporting.

Section 40 of the determination specifies that if a project is divided, this cannot involve division of a project area. This ensures that project management activities and related emissions are accounted for at the project area level.

Schedule 1 – Calculation of Soil Organic Carbon

This Schedule sets out the equations required to calculate the soil organic carbon stock change in a project area over the duration of the project.

Division 2 uses the outputs of analysis (carbon content, bulk density, etc) to determine the soil organic carbon stock of a sample. If analysis has been undertaken on the 0-30 cm layer only, as an entire layer these numbers can be used directly in Division 2. If the 0-30cm depth layers have been broken up into smaller sub-layers for analysis, or sampling is undertaken beyond 30cm, there are additional requirements in the Supplement. These additional instructions allow proponents to aggregate values required in the equations to the 0-xcm layer, where analysis has been undertaken on a layers smaller than the value of X (ie. the total depth of the sample).

It is important to note that when x cm is greater than 30 cm, analysis must be undertaken separately for the 0-30 cm and the 30-x cm depth layers. As there is more than one layer, of the additional requirements in the Supplement need to be used to determine the relevant inputs to the equations. Where sampling is undertaken to a depth greater than 30cm, the equations in schedule 1 must be undertaken twice:

1. once to determine the soil organic carbon stock for the 0-x cm layer which will be used to determine the total soil organic carbon stock change to calculate net abatement of the project; and
2. once to determine the soil organic carbon stock for the 0-30 cm layer, which must be calculated separately to ensure there are not inconsistencies with the National Inventory (which report soil organic carbon stock change to the 30 cm depth).

Variations in soil bulk density must be taken into account to measure soil carbon stock change over time correctly. Changes in bulk density through time will change the mass of soil sampled at a fixed depth and will affect the calculation of soil organic carbon stocks. Calculations must be included to adjust for these changes otherwise the magnitude of soil organic carbon stock change will be incorrect. The impact of variations in bulk density on soil organic carbon stock has been addressed in the Determination by using an equivalent soil mass approach.

Calculating the equivalent soil mass for each layer in a carbon estimation area during the baseline sampling round provides a fixed comparison point for calculating the soil organic carbon stocks of each layer at subsequent sampling rounds. The equivalent soil mass associated with the tenth percentile is used in these equations as it reduces the mathematical chance that the carbon content will be estimated on soil which nothing is known about.

Division 3 equations calculate the soil organic carbon stock and variance at each sampling round including baseline sampling. If equal area stratification and compositing of cores across strata is used, subdivision 2 is followed. If compositing of cores is undertaken within each stratum, or cores are analysed individually, subdivision 3 is followed. Subdivision 3 is applicable whether strata are equal or unequal in size.

Division 4 sets out the equations to calculate the soil organic carbon stock change for the project area between the baseline sampling round (t_0) and the first subsequent sampling round (t_1). Change in soil organic carbon stock for the remainder of the project is calculated using a linear regression. As three sample points are needed to start demonstrating a trend using a linear regression, this division allows proponents to earn some credits for a difference in mean soil organic carbon stock before there are three sample points collected (i.e. between the baseline sampling round and the first subsequent sampling round).

Where a trend has not been established, it is not possible to demonstrate whether a difference between the mean soil organic carbon stocks of two sampling rounds is due to inter-annual variability or the beginning of an increasing soil carbon stock. For this reason, only 50% of the soil carbon stock change is credited to the project at this time (subject to other discounts and buffers).

When biochar is applied to a carbon estimation area equations 26 and 40 must be adjusted by the assumed or measured total carbon content of biochar. If a lower percentage has not been determined by measurement, then for the purpose of the adjustment it is assumed that 100% of the mass of biochar applied is carbon. This adjustment is needed because the presence of biochar may interfere with the readings from in-field sensors and the models used to convert sensor data into estimates of soil carbon stock as well as combustion techniques. There is therefore a risk of over-crediting abatement if the carbon contained within the biochar is not accounted for when soil carbon measurements are taken. It is necessary to be able to conservatively estimate the amount of carbon introduced to the soil and therefore distinguish between genuine increases in soil carbon resulting from project activities and increases due to the introduction of carbon from outside the project boundary.

Division 5 sets out the equations to calculate the soil organic carbon stock change for the project area between the baseline sampling round (t_0) and the most recent sampling round (t_x). This can only be conducted once a minimum of three sampling rounds (including the baseline sampling round) have been conducted (t_0 to t_x).

The linear regression approach is used in this division as a trend line will more accurately describe the average soil organic carbon stock change over time due to new management actions, as it smooths the fluctuations in soil organic carbon stocks that can occur due to natural variation. This approach operates on the assumption that other factors that influence carbon, such as rainfall and temperature, are random and vary through time, but the impact of management actions on soil organic carbon tend to be constant and less variable.

The approach calculates the rate of soil organic carbon stock change based on the slope associated with a defined probability of 60% rather than the slope associated with a defined probability of 50% (line of best fit). That is, an average rate of soil organic carbon stock change that would be exceeded 60% of the time (rather than 50% of the time). This reduces the risk of over-estimating soil organic carbon stock change and provides a higher degree of confidence that the accumulation of soil organic carbon stock is real.

Schedule 2: Calculation of Project Emissions

Schedule 2 outlines the equations required to compare average annual baseline period emissions, to average annual reporting period emissions. The impact of the emissions on the net abatement amount is outlined in Part 4 Division 2 of this Explanatory Statement. Part 4, section 23 of the determination provides an overview of the emissions sources which are accounted for in the net abatement.

Section 2 of Schedule 2 contains a definition of the ‘NGA Factors document’ as the ‘National Greenhouse Accounts Factors’ published by the Department as in force from time to time. This is available from the Department’s website: www.environment.gov.au. It contains the emissions-intensity of various grids in Australia and is used across the scheme to assess the emissions related to electricity use.

Division 2 sets out the calculations for the average annual emissions in the baseline period. The baseline period is the 10 years immediately before the section 22 application of section 29 application relating to the project area. Total emissions for the baseline period are calculated individually for each emissions source. In order to compare these emissions with the project emissions, total emissions are converted to an average annual emission by multiplying total emissions by $\frac{1}{10}$ (as there are 10 years in the baseline period). The average annual emissions for each emissions source are then aggregated together to calculate the average annual emissions for the baseline period (from all sources).

Division 3 sets out the calculations for the average annual project emissions for a project area, for a given reporting period. Total emissions for the reporting period are calculated individually for each emissions source. In order to compare these emissions with the baseline period emissions, total emissions are converted to an average annual emission by adding together total emissions from each source and dividing by the number of years in the reporting period.

Division 4 sets out the calculations for the change in emissions between baseline emissions and a reporting period. The average annual baseline emissions (calculated using division 2) is subtracted from the average annual project emissions (calculated for the reporting period using division 3) and is multiplied by the number of years in the reporting period. This is used in the calculation of net abatement and the development of the project emissions buffer. Both are described in further detail in Part 4 Division 2 of this Explanatory Statement.

Statement of Compatibility with Human Rights

Prepared in accordance with Part 3 of the *Human Rights (Parliamentary Scrutiny) Act 2011*
Carbon Credits (Carbon Farming Initiative-Measurement of Soil Carbon Sequestration in Agricultural Systems) Methodology Determination 2018

This legislative instrument is compatible with the human rights and freedoms recognised or declared in the international instruments listed in section 3 of the *Human Rights (Parliamentary Scrutiny) Act 2011*.

Overview of the Legislative Instrument

The *Carbon Credits (Carbon Farming Initiative-Measurement of Soil Carbon Sequestration in Agricultural Systems) Methodology Determination 2018* (the determination) sets out the detailed rules for implementing and monitoring offsets projects that sequester carbon in agricultural soils using:

- (a) certain types of management actions on project land that could increase carbon inputs to soil and reduce losses of soil organic carbon; and
- (b) measuring soil carbon sequestration over time.

Project proponents wishing to implement the determination must make an application to the Clean Energy Regulator (the Regulator) and meet the eligibility requirements set out under the *Carbon Credits (Carbon Farming Initiative) Act 2011*. Offsets projects that are approved by the Regulator can generate Australian carbon credit units.

Human rights implications

This legislative instrument does not engage any of the applicable rights or freedoms.

Conclusion

This legislative instrument is compatible with human rights as it does not raise any human rights issues.

Josh Frydenberg, Minister for the Environment and Energy